

Tools for threading

Threading solutions from the Walter Prototyp competence brand offer a high degree of innovation. They reduce costs, increase productivity and provide decisive competitive advantages. In our comprehensive range of catalogue products, you can find the right tool for any machining method or process: HSS-E (-PM) and solid carbide taps, thread formers and thread milling cutters. At sizes of $\geq M1$, these tools are available as part of our standard range.

1 TMO and TMO HRC orbital thread milling cutters

[from page B 1108]

- Solid carbide thread milling cutters with TiCN and TAX coating
- For particularly small threads from M1.6 upwards
- TMO HRC specially developed for hardened materials up to 65 HRC from size M2 upwards

2 Thread milling cutters

[from page B 1090]

- Solid carbide thread milling cutters for universal applications at pitches of up to 3 mm
- Thread milling with chamfering (TMC) possible in one operation up to a pitch of 2 mm

3 Thread milling cutters with indexable inserts

[from page B 1116]

- For large threads < M20

4 TMD drill thread milling cutters

[from page B 1107]

- Drilling, countersinking and thread milling in one operation
- Three-edged solid carbide tool for high feeds and high tool life quantities
- With NHC coating for machining aluminium and with TAX coating for grey cast iron



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5 Paradur® HSC

[from page B 990]

- Taps made of micrograin carbide with a special geometry for blind hole threads in steel up to 55 HRC
- With internal cooling and TiCN coating

6 Protodyn® (S) Eco Plus

[from page B 1034]

- HSS-E thread formers with new geometry both in the chamfer and polygon areas
- Tools with special surface treatment with TiN and TiCN coating in the product range

7 Paradur® Eco Plus

[from page B 780]

- HSS-E-PM blind hole taps for universal use
- The tool with THL coating is particularly suitable for adverse chip formation and difficult materials
- Particularly cost-effective for wet machining and minimum quantity lubrication

8 Prototex® X-pert P

[from page B 750]

- The X-pert tool families are available for four material groups (X-pert P, X-pert M, X-pert K and X-pert N) for machining blind and through holes

B 5

HSS-E (-PM) taps

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Solid carbide taps

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HSS-E (-PM) taps product range overview

M – Metric thread

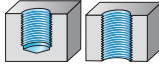
Machining						
Thread depth	1 × D _N					1,5 × D _N
Designation	Prototex® OS	MMB	AMB	AMB Inox	Protostep Inox	Paradur® Combi
Dimension range	M1–M10	M2–M16	M3–M10	M6–M12	M3–M16	M3–M11
Tolerance	6H	6H	6G / 7G	6HX	6HX	6H
Coolant supply	External	External	External	External	External	External
Chamfer/Lead form	B	NA	18 P	18 P	NA	C
Coating/grade	Uncoated	Uncoated	NiD / TiN	NiD	VAP	Uncoated
Version length	M	M	M	M	M	M
Page	B 748	B 775	B 776	B 778	B 779	B 768
						

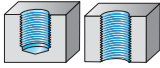
Machining						
Thread depth	2 × D _N		3 × D _N			
Designation	Prototex® TiNi	Prototex® TiNi Plus	TC216 Perform	Prototex® Synchrospeed	Paradur® N	Prototex® X-pert P
Dimension range	M1–M24	M2–M20	M3–M20	M2–M24	M3–M12	M1–M56
Tolerance	4HX / 6HX	6HX	6H	6HX	6H	4H / 6H / 6G / 7G
Coolant supply	External	External	External	External	External	External
Chamfer/Lead form	B	B	B	B	D	B
Coating/grade	Uncoated / TiCN	ACN	WY80FC / WY80AA	THL / TiN	Uncoated	Uncoated / TiCN / TiN
Version length	M	M	M	M	M	M / L / XL
Page	B 763	B 765	B 746	B 747	B 749	B 750
						

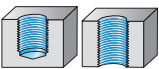
Machining						
Thread depth	3 × D _N					
Designation	Prototex® X-pert P	Prototex® X-pert P AZ	Prototex® X-pert M	Prototex® X-pert N	Prototex® Sprint	Prototex® Megasprint
Dimension range	M2 LH–M20 LH	M3–M10	M1–M36	M2–M10	M3–M20	M6–M20
Tolerance	6H	6H	6HX / 6GX	6H	6H	6H
Coolant supply	External	External	External	External	External	Radial
Chamfer/Lead form	B	B	B	B	B	B
Coating/grade	Uncoated	Uncoated	TiCN / TiN / VAP	Uncoated	TiCN / TiN	TiN
Version length	M	M	M	M	M	M
Page	B 753	B 756	B 760	B 762	B 766	B 767
						

HSS-E (-PM) taps product range overview

M – Metric thread

Machining						
Thread depth	$3 \times D_N$	$3,5 \times D_N$		$1,5 \times D_N$		$2 \times D_N$
Designation	KMB H	Prototex® Eco Plus	Prototex® Eco Plus	Paradur® H	Paradur® H AZ	HGB
Dimension range	M3–M12	M2–M30	M3 LH–M20 LH	M1–M42	M3–M10	M2–M30
Tolerance	6H	6HX / 6GX	6HX	6H	6H	6H
Coolant supply	External	External / radial	External	External	External	External
Chamfer/Lead form	B	B	B	C	C	C
Coating/grade	Uncoated	THL / TIN	THL	TiN / uncoated	Uncoated	Uncoated
Version length	S	M	M	M	M	S
Page	B 774	B 742	B 744	B 790	B 791	B 769
						

Machining						
Thread depth	$2 \times D_N$				$3 \times D_N$	
Designation	HGB Inox	HGB Ti	Paradur® AP	Paradur® FT	KMB Ms	Paradur® Eco CI
Dimension range	M2–M30	M3–M12	M3–M20	M3–M10	M2–M8	M3–M30
Tolerance	6HX	6HX	6HX	6H	6H	6HX
Coolant supply	External	External	External	External	External	External
Chamfer/Lead form	C	C	C	D	E	C / E
Coating/grade	VAP	NID	NIT	Uncoated	Uncoated	TiCN / NID
Version length	S	S	M	M	S	M / XL
Page	B 770	B 771	B 825	B 831	B 773	B 814
						

Machining						
Thread depth	$3 \times D_N$	$1,5 \times D_N$				$2 \times D_N$
Designation	Paradur® X-pert K	Paradur® N	Paradur® Inox® 25	Paradur® Ni	Paradur® Ni 10	Paradur® Ti
Dimension range	M3–M20	M2–M36	M5–M20	M2–M20	M3–M16	M1–M36
Tolerance	6HX	6H / 6G	6HX	4HX / 6HX	6HX	6HX
Coolant supply	External	External	External	External	External	External
Chamfer/Lead form	C	C	E	C	C	C
Coating/grade	TAFT	TiCN / TiN / uncoated	TiN	Uncoated	TiN / uncoated	TiCN / uncoated
Version length	M	M	M	M	M	M
Page	B 820	B 794	B 813	B 826	B 828	B 829
						

HSS-E (-PM) taps product range overview

M – Metric thread

Machining						
Thread depth	$2 \times D_N$		$2,5 \times D_N$			
Designation	Paradur® Ti Plus	Paradur® Sprint	Paradur® Synchrospeed	Paradur® H 24	Paradur® STE	Paradur® X-pert M
Dimension range	M2–M20	M3–M20	M2–M24	M3–M16	M3–M24	M1.6–M42
Tolerance	6HX	6H	6HX	6HX	6HX	6HX / 6GX
Coolant supply	External	External	External / axial	External	External	External
Chamfer/Lead form	C	C	C	C	E	C
Coating/grade	ACN	TICN / TIN	TIN/VAP / THL	Uncoated	THL / uncoated	TICN / TIN / VAP / THL
Version length	M	M	M	M	M	M / XL
Page	B 830	B 834	B 788	B 797	B 808	B 810
						

Machining						
Thread depth	$2,5 \times D_N$	$3 \times D_N$				
Designation	Paradur® Megasprint	KMB WST	Paradur® Eco Plus	Paradur® Eco Plus	TC115 Perform	Paradur® X-pert P
Dimension range	M6–M20	M3–M12	M2–M64	M3 LH–M20 LH	M3–M20	M1.6–M64
Tolerance	6H	6H	6HX / 6GX	6HX	6H	4H / 6H / 6G / 7G /
Coolant supply	Axial	External	External / axial / radial	External	External	External
Chamfer/Lead form	C	C	C / E	C	C	C
Coating/grade	TiN	Uncoated	THL / TiN	THL	WY80FC / WY80AA	Uncoated / TiN / THL
Version length	M	S	M	M	M	M / L / XL
Page	B 835	B 772	B 780	B 783	B 787	B 798
						

Machining						
Thread depth	$3 \times D_N$					
Designation	Paradur® X-pert P	Paradur® X-pert P AZ	Paradur® Secur	TC142 Supreme	Paradur® Eco CI	Paradur® X-pert N
Dimension range	M3 LH–M30 LH	M3–M12	M4–M30	M1.6–M36	M4–M24	M1.6–M20
Tolerance	6H	6H	6HX	6HX	6HX	6H / 6G
Coolant supply	External	External	External	External	Axial / radial	External
Chamfer/Lead form	C	C	C	C	C / E	C
Coating/grade	Uncoated	Uncoated	TiN	WY80FC / WW60RB	TICN	Uncoated
Version length	M	M	M	M	M	M
Page	B 800	B 803	B 806	B 809	B 815	B 821
						

HSS-E (-PM) taps product range overview

M – Metric thread

Machining					
Thread depth	$3 \times D_N$		$3,5 \times D_N$		
Designation	Paradur® WLM Synchrospeed	Paradur® Uni	Paradur® HT	Paradur® NH	Paradur® Short Chip HT
Dimension range	M3–M10	M2–M36	M4–M36	M4–M12	M5–M12
Tolerance	6H	6H / 6G	6H	6H	6HX
Coolant supply	External	External	Axial	Axial	Axial
Chamfer/Lead form	C	C	C	C	C
Coating/grade	CrN / uncoated	TiN / vap / uncoated	TiN	TiN / uncoated	THL / uncoated
Version length	M	M	M / L	M	M
Page	B 824	B 832	B 792	B 796	B 807
					

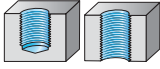
HSS-E (-PM) taps product range overview

MF – Metric fine-pitch thread

Machining						
Thread depth	$2 \times D_N$		$3 \times D_N$			
Designation	Prototex® TiNi	Prototex® TiNi Plus	TC216 Perform	Prototex® Synchrospeed	Prototex® X-pert P	Prototex® X-pert P
Dimension range	MF 8x0.75–MF 16x1	MF 6x0.75–MF 14x1.5	MF 8x1–MF 18x1.5	MF 8x1–MF 16x1.5	MF 2x0.25–MF 50x1.5	MF 8x1 LH–MF 20x1.5 LH
Tolerance	6HX	6HX	6H	6HX	6H / 6G	6H
Coolant supply	External	External	External	External	External	External
Chamfer/Lead form	B	B	B	B	B	B
Coating/grade	Uncoated	ACN	WY80FC / WY80AA	TiN / THL	TiN / uncoated	Uncoated
Version length	M	M	M	M	M	M
Page	B 847	B 848	B 838	B 839	B 840	B 843
						

HSS-E (-PM) taps product range overview

MF – Metric fine-pitch thread

Machining						
Thread depth	3 × D _N		3,5 × D _N	1,5 × D _N		3 × D _N
Designation	Prototex® X-pert M	Prototex® Sprint	Prototex® Eco Plus	Paradur® H	Paradur® H	Paradur® Eco Cl
Dimension range	MF 5x0.5– MF 24x1.5	MF 8x1– MF 20x1.5	MF 6x0.75– MF 22x1.5	MF 2x0.25– MF 52x1.5	MF 4x0.5 LH– MF 24x1.5 LH	MF 8x1– MF 22x1.5
Tolerance	6HX / 6GX	6H	6HX	6H	6H	6HX
Coolant supply	External	External	External / radial	External	External	External
Chamfer/Lead form	B	B	B	C	C	E
Coating/grade	TIN / VAP	TIN	THL	Uncoated	Uncoated	TICN
Version length	M	M	M	M	M	M
Page	B 845	B 849	B 836	B 855	B 857	B 871
						

Machining						
Thread depth	1,5 × D _N				2 × D _N	
Designation	Paradur® HN	Paradur® N	Paradur® Inox® 25	Paradur® Ni 10	Paradur® Ti	Paradur® Ti Plus
Dimension range	MF 12x1.5– MF 22x1.5	MF 4x0.5– MF 36x1.5	MF 10x1– MF 24x1.5	MF 8x1– MF 12x1.25	MF 8x0.75– MF 16x1	MF 6x0.75– MF 14x1.5
Tolerance	6HX	6H / 6G	6HX	6HX	6HX	6HX
Coolant supply	External	External	External	External	External	External
Chamfer/Lead form	E	C	E	C	C	C
Coating/grade	Uncoated	Uncoated / TiCN / TiN	TIN	Uncoated	Uncoated	ACN
Version length	M	M	M	M	M	M
Page	B 858	B 860	B 870	B 874	B 875	B 876
						

Machining						
Thread depth	2 × D _N	2,5 × D _N			3 × D _N	
Designation	Paradur® Sprint	Paradur® Synchronspeed	Paradur® STE	Paradur® X-pert M	Paradur® Eco Plus	TC115 Perform
Dimension range	MF 8x1– MF 20x1.5	MF 8x1– MF 16x1.5	MF 8x1– MF 18x1.5	MF 4x0.5– MF 30x2	MF 6x0.75– MF 22x1.5	MF 8x1– MF 18x1.5
Tolerance	6H	6HX	6HX	6HX / 6GX	6HX	6H
Coolant supply	External	External	External	External	External / axial	External
Chamfer/Lead form	C	C	E	C	C / E	C
Coating/grade	TIN	TIN/VAP / THL	THL	TIN / VAP	THL	WY80FC / WY80AA
Version length	M	M	M	M	M	M
Page	B 878	B 854	B 866	B 868	B 850	B 853
						

HSS-E (-PM) taps product range overview

MF – Metric fine-pitch thread

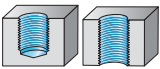
Machining						
Thread depth	$3 \times D_N$					$3,5 \times D_N$
Designation	Paradur® X-pert P	TC142 Supreme	Paradur® Eco CI	Paradur® X-pert N	Paradur® Uni	Paradur® HT
Dimension range	MF 2.5x0.35– MF 52x2	MF 8x1– MF 20x1.5	MF 8x1– MF 22x1.5	MF 8x1– MF 20x1.5	MF 4x0.5– MF 30x2	MF 10x1– MF 33x2
Tolerance	6H / 6G	6HX	6HX	6H	6H	6H
Coolant supply	External	External	Axial	External	External	Axial
Chamfer/Lead form	C	C	C	C	C	C
Coating/grade	Uncoated / TiN	WW60RB	TiCN	Uncoated	Uncoated	TiN
Version length	M	M	M	M	M	M
Page	B 862	B 867	B 872	B 873	B 877	B 859
						

Machining	
Thread depth	$3,5 \times D_N$
Designation	Paradur® Short Chip HT
Dimension range	MF 12x1.5– MF 16x1.5
Tolerance	6HX
Coolant supply	Axial
Chamfer/Lead form	C
Coating/grade	THL / uncoated
Version length	M
Page	B 865
	

HSS-E (-PM) taps product range overview

UNC/UNF/UN-8

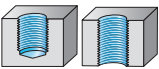
Machining						
Thread depth	3 × D _N	2,5 × D _N	2 × D _N	3 × D _N		3,5 × D _N
Designation	Paradur® X-pert P	Paradur® X-pert M	Prototex® TiNi	Prototex® X-pert P	Prototex® X-pert M	Prototex® Eco Plus
Dimension range	UN 1.1/8-8– UN 2.1/4-8	UN 1.1/8-8– UN 2"-8	UNC 2-56– UNC 3/4-10	UNC 2-56– UNC 1.1/2-6	UNC 2-56– UNC 1"-8	UNC 2-56– UNC 5/8-11
Tolerance	2B	3B / 2B	3B / 2B	3B / 2B	2B	2B
Coolant supply	External	External	External	External	External	External
Chamfer/Lead form	C	C	B	B	B	B
Coating/grade	Uncoated	VAP	Uncoated	Uncoated / TiN	TiN / VAP	THL
Version length	M	M	M	M	M	M
Page	B 892	B 894	B 884	B 880	B 883	B 879
						

Machining						
Thread depth	3 × D _N	1,5 × D _N		2 × D _N	2,5 × D _N	3 × D _N
Designation	Paradur® Eco CI	Paradur® N	Paradur® Ni	Paradur® Ti	Paradur® X-pert M	Paradur® Eco Plus
Dimension range	UNC 6-32– UNC 7/8-9	UNC 1-64– UNC 1"-8	UNC 2-56– UNC 3/4-10	UNC 6-32– UNC 5/8-11	UNC 2-56– UNC 1.1/2-6	UNC 2-56– UNC 3/4-10
Tolerance	2B	3B / 2B	3B / 2B	3B / 2B	2B	2B
Coolant supply	External	External	External	External	External	External / axial
Chamfer/Lead form	C	C	C	C	C	C
Coating/grade	NiD	Uncoated	Uncoated	Uncoated	TiN / VAP	THL
Version length	M	M	M	M	M	M
Page	B 896	B 888	B 898	B 900	B 893	B 886
						

Machining						
Thread depth	3 × D _N		2 × D _N	3 × D _N		3,5 × D _N
Designation	Paradur® X-pert P	Paradur® X-pert N	Prototex® TiNi	Prototex® X-pert P	Prototex® X-pert M	Prototex® Eco Plus
Dimension range	UNC 2-56– UNC 1.1/2-6	UNC 2-56– UNC 3/8-16	UNF 4-48– UNF 5/8-18	UNF 0-80– UNF 1.1/2-12	UNF 5-44– UNF 1"-12	UNF 4-48– UNF 5/8-18
Tolerance	3B / 2B	2B	3B / 2B	3B / 2B	2B	2B
Coolant supply	External	External	External	External	External	External
Chamfer/Lead form	C	C	B	B	B	B
Coating/grade	Uncoated	Uncoated	Uncoated	Uncoated / TiN	TiN / VAP	THL
Version length	M	M	M	M	M	M
Page	B 890	B 897	B 907	B 903	B 906	B 902
						

HSS-E (-PM) taps product range overview

UNC/UNF/UN-8

Machining						
Thread depth	$3 \times D_N$	$1,5 \times D_N$		$2 \times D_N$	$2,5 \times D_N$	$3 \times D_N$
Designation	Paradur® Eco Cl	Paradur® N	Paradur® Ni	Paradur® Ti	Paradur® X-pert M	Paradur® Eco Plus
Dimension range	UNF 6-40– UNF 7/8-14	UNF 0-80– UNF 7/8-14	UNF 6-40– UNF 5/8-18	UNF 6-40– UNF 5/8-18	UNF 6-40– UNF 1"-12	UNF 4-48– UNF 5/8-18
Tolerance	2B	3B / 2B	3B	3B / 2B	2B	2B
Coolant supply	External	External	External	External	External	External / axial
Chamfer/Lead form	C	C	C	C	C	C
Coating/grade	NiD	Uncoated	Uncoated	Uncoated	TiN / VAP	THL
Version length	M	M	M	M	M	M
Page	B 915	B 911	B 916	B 917	B 914	B 909
						

Machining	
Thread depth	$3 \times D_N$
Designation	Paradur® X-pert P
Dimension range	UNF 1-72– UNF 1.1/2-12
Tolerance	2B
Coolant supply	External
Chamfer/Lead form	C
Coating/grade	TiN / uncoated
Version length	M
Page	B 913
	

HSS-E (-PM) taps product range overview MJ/UNJC/UNJF

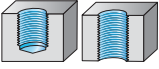
Machining						
Thread depth	1,5 x D _N	2 x D _N	1,5 x D _N	2 x D _N	1,5 x D _N	2 x D _N
Designation	Paradur® Ni 10	Paradur® Ti	Paradur® Ni 10	Prototex® TiNi Plus	Paradur® Ni 10	Paradur® Ti Plus
Dimension range	MJ 3– MJ 6	MJ 3– MJ 10	UNJC 4-40– UNJC 3/8-16	UNJF 10-32– UNJF 3/8-24	UNJF 6-40– UNJF 3/8-24	UNJF 10-32– UNJF 3/8-24
Tolerance	4H	4H	3B	3B	3B	3B
Coolant supply	External	External	External	External	External	External
Chamfer/Lead form	C	C	C	B	C	C
Coating/grade	Uncoated	Uncoated	Uncoated	ACN	Uncoated	ACN
Version length	M	M	M	M	M	M
Page	B 919	B 920	B 921	B 924	B 922	B 923
						

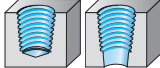
HSS-E (-PM) taps product range overview G/Rc/Rp

Machining					 	
Thread depth	3 x D _N			3,5 x D _N	1,5 x D _N	3 x D _N
Designation	Prototex® Synchrospeed	Prototex® X-pert P	Prototex® X-pert M	Prototex® Eco Plus	Paradur® H	KMB Ms
Dimension range	G 1/8-28– G 1/2-14	G 1/8-28– G 2"-11	G 1/8-28– G 1"-11	G 1/8-28– G 1"-11	G 1/8-28– G 2.1/2-11	G 1/8-28– G 1"-11
Tolerance	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
Coolant supply	External	External	External	External	External	External
Chamfer/Lead form	B	B	B	B	C	F
Coating/grade	THL	TiN / uncoated	TiN / VAP	THL	Uncoated	Uncoated
Version length	M	M	M	M	M	
Page	B 926	B 927	B 928	B 925	B 932	B 929
						

HSS-E (-PM) taps product range overview

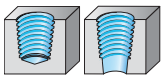
G/Rc/Rp

Machining						
Thread depth	$3 \times D_N$	$1,5 \times D_N$		$2,5 \times D_N$		
Designation	Paradur® Eco CI	Paradur® N	Paradur Inox® 25	Paradur® Synchrospeed	Paradur® STE	Paradur® X-pert M
Dimension range	G 1/8-28– G 1.1/2-11	G 1/8-28– G 1"-11	G 1/4-19– G 3/4-14	G 1/8-28– G 1/2-14	G 1/8-28– G 1/2-14	G 1/8-28– G 1"-11
Tolerance	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
Coolant supply	External	External	External	External	External	External
Chamfer/Lead form	C	C	E	C	E	C
Coating/grade	TICN / NID	Uncoated	TIN	THL	THL / uncoated	TIN / VAP
Version length	M	M	M	M	M	M
Page	B 939	B 933	B 938	B 931	B 935	B 937
						

Machining						
Thread depth	$3 \times D_N$					
Designation	Paradur® Eco Plus	Paradur® X-pert P	TC142 Supreme	Paradur® X-pert N	Paradur® Uni	Paradur® H
Dimension range	G 1/8-28– G 1"-11	G 1/8-28– G 2"-11	G 1/8-28– G 1/4-19	G 1/8-28	G 1/8-28– G 1"-11	Rc 1/8-28– Rc 1.1/2-11
Tolerance	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
Coolant supply	External	External	External	External	External	External
Chamfer/Lead form	C	C	C	C	C	C
Coating/grade	THL	TiN / uncoated	WY80FC	Uncoated	Uncoated	Uncoated
Version length	M	M	M	M	M	M
Page	B 930	B 934	B 936	B 940	B 941	B 942
						

Machining	
Thread depth	$1,5 \times D_N$
Designation	Paradur® H
Dimension range	Rp 1/8-28– Rp 1.1/2-11
Tolerance	NORMAL
Coolant supply	External
Chamfer/Lead form	C
Coating/grade	Uncoated
Version length	M
Page	B 943
	

HSS-E (-PM) taps product range overview NPT/NPTF

Machining						
Thread depth						
Designation	Paradur® H	Paradur® N	Paradur Inox®	Paradur Inox® 40	Paradur® Ni	Paradur® H
Dimension range	NPT 1/16-27- NPT 2"-11.5	NPT 1/16-27- NPT 1"-11.5	NPT 1/16-27- NPT 1"-11.5	NPT 1/8-27- NPT 1/2-14	NPT 1/16-27- NPT 1"-11.5	NPTF 1/16-27- NPTF 1"-11.5
Tolerance	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
Coolant supply	External	External	External	External	External	External
Chamfer/Lead form	C	C	C	C	C	C
Coating/grade	Uncoated	VAP	THL / VAP	Uncoated	Uncoated	Uncoated
Version length	M	M	M	M	M	M
Page	B 944	B 945	B 946	B 947	B 948	B 949
						

Machining		
Thread depth		
Designation	Paradur® N	Paradur Inox®
Dimension range	NPTF 1/16-27- NPTF 3/4-14	NPTF 1/16-27- NPTF 1/2-14
Tolerance	NORMAL	NORMAL
Coolant supply	External	External
Chamfer/Lead form	C	C
Coating/grade	VAP	VAP
Version length	M	M
Page	B 950	B 951
		

HSS-E (-PM) taps product range overview

Pg/BSW/TR

Machining					
Thread depth	$3 \times D_N$	$3 \times D_N$	$3 \times D_N$	$2 \times D_N$	
Designation	Prototex® X-pert P	Paradur® X-pert P	KMB H	TMB	TMB
Dimension range	BSW 1/8-40– BSW 1"–8	BSW 1/8-40– BSW 1"–8	Pg 7-20– Pg 21-16	Tr 8x1.5– Tr 28x5	Tr 10x2 LH– Tr 26x5 LH
Tolerance	MEDIUM	MEDIUM	NORMAL	7H	7H
Coolant supply	External	External	External	External	External
Chamfer/Lead form	B	C	B	24 P	24 P
Coating/grade	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated
Version length	M	M	M	M	M
Page	B 953	B 954	B 952	B 955	B 956
					

HSS-E (-PM) taps product range overview

Thread insert

Machining						
Thread depth	$2 \times D_N$	$3 \times D_N$		$1,5 \times D_N$	$2 \times D_N$	$2,5 \times D_N$
Designation	Prototex® TiNi	Prototex® X-pert P	Prototex® X-pert M	Paradur® Ni	Paradur® Ti	Paradur® X-pert M
Dimension range	EGM4– EGM8	EGM2.5– EGM16	EGM2.5– EGM8	EGM4– EGM8	EGM4– EGM8	EGM2.5– EGM16
Tolerance	4H	6Hmod	6Hmod	4H	4H	6Hmod
Coolant supply	External	External	External	External	External	External
Chamfer/Lead form	B	B	B	C	C	C
Coating/grade	Uncoated	Uncoated	VAP	Uncoated	Uncoated	VAP
Version length	M	M	M	M	M	M
Page	B 959	B 957	B 958	B 963	B 964	B 961
						

HSS-E (-PM) taps product range overview

Thread insert

Machining						
Thread depth	3 × D _N			2 × D _N	3 × D _N	2 × D _N
Designation	Paradur® X-pert P	Paradur® X-pert N	Paradur® X-pert P	Prototex® TiNi	Prototex® X-pert P	Paradur® Ti
Dimension range	EGM2.5–EGM24	EGM2.5–EGM16	EGMF 8x1–EGMF 16x1.5	EGUNC 4-40–EGUNC 8-32	EGUNC 6-32–EGUNC 1/4-20	EGUNC 4-40–EGUNC 8-32
Tolerance	6Hmod	6Hmod	6Hmod	3B	3B	3B
Coolant supply	External	External	External	External	External	External
Chamfer/Lead form	C	C	C	B	B	C
Coating/grade	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated
Version length	M	M	M	M	M	M
Page	B 960	B 962	B 965	B 967	B 966	B 971
						

Machining						
Thread depth	$2,5 \times D_N$	$3 \times D_N$		$2 \times D_N$	$3 \times D_N$	
Designation	Paradur® X-pert M	Paradur® X-pert P	Paradur® X-pert N	Prototex® TiNi	Prototex® X-pert P	Prototex® X-pert M
Dimension range	EGUNC 4-40–EGUNC 1/2-13	EGUNC 6-32–EGUNC 1/4-20	EGUNC 6-32–EGUNC 1/4-20	EGUNF 10-32–EGUNF 3/8-24	EGUNF 6-40–EGUNF 1/2-20	EGUNF 8-36–EGUNF 1/4-28
Tolerance	3B	3B	3B	3B	3B	3B
Coolant supply	External	External	External	External	External	External
Chamfer/Lead form	C	C	C	B	B	B
Coating/grade	vap	Uncoated	Uncoated	Uncoated	Uncoated	vap
Version length	M	M	M	M	M	M
Page	B 969	B 968	B 970	B 974	B 972	B 973
						

Machining					
Thread depth	$1,5 \times D_N$	$2 \times D_N$	$2,5 \times D_N$	$3 \times D_N$	
Designation	Paradur® Ni	Paradur® Ti	Paradur® X-pert M	Paradur® X-pert P	Paradur® X-pert N
Dimension range	EGUNF 10-32–EGUNF 3/8-24	EGUNF 10-32–EGUNF 3/8-24	EGUNF 10-32–EGUNF 1/4-28	EGUNF 6-40–EGUNF 1/2-20	EGUNF 10-32–EGUNF 1/4-28
Tolerance	3B	3B	3B	3B	3B
Coolant supply	External	External	External	External	External
Chamfer/Lead form	C	C	C	C	C
Coating/grade	Uncoated	Uncoated	vap	Uncoated	Uncoated
Version length	M	M	M	M	M
Page	B 978	B 979	B 976	B 975	B 977
					



HSS-E (-PM) taps designation key

Example:

E	P	2	0	5	6	3	4	2
1	2	3	4	5	6	7	8	9

1	2	3	4	5
Tool range	Tool generation	Tool type	Thread type	Design
Empty DIN threading tools A ANSI E Eco S Synchrospeed P X-pert P M X-pert M K X-pert K N X-pert N	P Plus	2 HSS taps 3 Set 4 Interrupted teeth (AZ)	0 Metric 1 Metric fine 2 UNC / UN 3 UNF / UNEF 4 G / Rp / Rc 5 NPT / NPSM 6 NPTF 7 Pg 8 BSW / W 9 Tr	0 Manual taps (HGB) 1 Short machine taps (KMB) 2 Prototex®, spiral point 3 Paradur®, straight flutes (or Prototex® H) 4 Paradur®, low-helix 5 Paradur®, high-helix flutes > 25° 6 Automatic nut tap (AMB), short shank 7 AMB/MMB/trapezoidal, long shank 8 Stepped AMB/MMB, trapezoidal tap set

6	7	8	9
Tolerance/shank	Tool type	Modification	Surface treatment
0 ISO 1/4H, 4HX, 3B, 3BX Reinforced shank 1 ISO 2/6H, 6HX, 2B, 2BX Reinforced shank 2 5G Reinforced shank 3 ISO 3/6G, 6GX Reinforced shank 4 7G, 7GX Reinforced shank 5 ISO 1/4H, 4HX, 3B, 3BX Reduced shank 6 ISO 2/6H, 6HX, 2B, 2BX Reduced shank 7 5G Reduced shank 8 ISO 3/6G, 6GX Reduced shank 9 7G, 7GX Reduced shank	0 Short Chip HT, HT, Ni, STE 1 H, HT, N, OS 2 NH, HP 3 Eco Plus, Synchrospeed, X-pert M 4 X-pert K 5 MS 6 X-pert N, Ti, TiNi 7 Combi 9 X-pert P, Secur	0 None 1 Internal coolant supply, axial outlet 2 Different thread type 3 Extended shank 4 Internal coolant supply, radial outlet 5 Combination of various points 6 Different number of flutes 7 Reduced/different helix 8 Left-hand thread 9 Insert	0 None 2 THL 4 CRN 5 TiN 6 TiCN 7 TAFT

Example:

T	C	1	42	–	M10×1.25	–	C	0	–	W	Y	80	AA
1	2	3	4	5	6	7	8	Grade					

1 Tool group T Threading	2 Generation	3 Tool type 1 Blind hole taps 2 Through hole taps	4 Tool type 15 Universal 45° helix angle 300-1000 N/mm² 16 Universal Straight-fluted, spiral point 300-1000 N/mm² 42 ISO M 50° helix angle < 1000 N/mm²
5 1. Delimiters – Metric D DIN-ANSI	6 Thread dimensions	7 Tolerance/shank type C ISO 2/6H, 6HX Reinforced shank L ISO 2/6H, 6HX Reduced shank	8 Modification 0 External coolant

Grade designation key
for solid carbide and HSS cutting tool materials

Example:

W	Y	80	AA
Walter	1	2	3

1 Substrate Solid carbide HSS W Y	2 Range of applications Wear resistance 05 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 Toughness	3 Coating FC Vaporised AA TiN RB TiAlN
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B5

Walter Select – HSS-E (-PM) taps

Step by step to the right tool

STEP 1

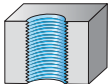
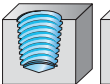
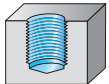
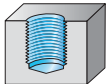
Determine the **material** to be machined from page B 1174 onwards:

Note the **machining group** that corresponds to your material, e.g.: P10.

Code letters	Machining groups	Groups of the materials to be machined	
P	P1–P15	Steel	All types of steel and steel casting, with the exception of steel with an austenitic structure
M	M1–M3	Stainless steel	Austenitic stainless steel, austenitic-ferritic steel and steel casting
K	K1–K7	Cast iron	Grey cast iron, cast iron with spheroidal graphite, malleable cast iron, cast iron with vermicular graphite
N	N1–N10	NF metals	Aluminium and other non-ferrous metals, non-ferrous materials
S	S1–S10	Materials with difficult cutting properties	Heat-resistant special alloys based on iron, nickel and cobalt, titanium and titanium alloys
H	H1–H4	Hard materials	Hardened steel, hardened cast iron materials, chilled cast iron
O	O1–O6	Other	Plastics, glass and carbon fibre reinforced plastics, graphite

STEP 2

Select your intended **application** from the table.

Tapping HSS-E (-PM)													
													
Thread depth	1,0 × D _N	2,0 × D _N	3,0 × D _N	3,5 × D _N	–		1,5 × D _N	2,0 × D _N	3,0 × D _N	1,5 × D _N	2,0 × D _N	2,5 × D _N	3,0 × D _N
Page	B 728	B 729	B 729	B 732	B 732		B 733	B 734	B 735	B 735	B 737	B 737	B 739

STEP 3

Select your **tool** from the table from page B 728 onwards, based on the following criteria:

- Material group
- Thread type
- Thread depth

Material group		Overview of the main material groups and code letters		Machining			
				Thread depth		1 × D _N	
				Designation	Prototex® OS	MMB	
				Coolant / supply	External	External	
				Coating / grade	Uncoated	Uncoated	
				Thread type / Page	M / B 748	M / B 775	
				Thread hardness (HRC) Tapable strength (N/mm²)	Drilling group 	Drilling group 	
P	Non-alloyed steel	C ≤ 0.25%	Annealed	125 430 P1	●	●	
		C > 0.25... ≤ 0.55%	Annealed	190 640 P2	●	●	
		C > 0.25... ≤ 0.55%	Heat-treated	210 710 P3	●	●	
		C > 0.55%	Annealed	190 640 P4	●	●	
		C > 0.55%	Heat-treated	300 1010 P5	●	●	
	Low-alloyed steel	Free cutting steel (short-chipping)	Annealed	220 750 P6	●	●	
		Annealed	175 590 P7	●	●		
		Heat-treated	285 960 P8				
		Heat-treated	380 1280 P9				
		Heat-treated	430 1480 P10				
High-alloyed steel and high-alloyed tool steel	Annealed	200 680 P11					
	Hardened and tempered	300 1010 P12					
	Hardened and tempered	360 1280 P13					
	Ferritic/martensitic, annealed	200 680 P14					
	Martensitic, heat-treated	330 1110 P15					
M	Stainless steel	Austenitic, quench hardened	200 680 M1				
		Austenitic, precipitation hardened (PH)	300 1010 M2				
		Austenitic/Ferritic, duplex	230 760 M3				
		Ferritic	200 600 K1				
	Malleable cast iron						

STEP 4

The corresponding page in the catalogue is specified following tool selection.

At the bottom right of the catalogue page, you will find a reference to the **cutting data table**.

[illegible]

STEP 5

Select the **cutting data** for the tool type from page B 1008 onwards.

Material group	 = Cooling lubricant recommended E = Emulsion O = Oil vc = Cutting speed	Overview of the main material groups and code letters									
		Tensile strength R_{m} N/mm ²	Borel hardness HB	Machining group ¹	HSS-E (PM) taps						
					Uncoated						
					$1.5 \times D_h$	$2 \times D_h$	$2.5 \times D_h$				
						v_c [m/min]					
P	Non-alloyed steel	C < 0.25%	Annealed	125	430	P1	16	13	12	E	
		C > 0.25% to < 0.55%	Annealed	190	640	P2	20	17	14	E	
		C > 0.25% to < 0.55%	Heat-treated	210	710	P3	10	9	7	E	
		C > 0.55%	Annealed	190	640	P4	10	9	7	E	
		C > 0.55%	Heat-treated	300	1010	P5	6	5	4	E	
	Low-alloyed steel	Free cutting steel (short-chipping)	Annealed	220	750	P6	10	9	7	E	
		Annealed	175	590	P7	20	17	14	E		
		Heat-treated	285	960	P8	5	4	4	E		
		Heat-treated	380	1280	P9	3	3	2	E		
		Heat-treated	430	1480	P10	3	2	2	O		
High-alloyed steel and high-alloyed tool steel	Annealed	200	680	P11	10	9	7	E			
	Hardened and tempered	300	1010	P12	6	5	4	E			
	Hardened and tempered	380	1280	P13	3	3	2	O			
Stainless steel	Ferritic/martensitic, annealed	200	680	P14	3	2	2	E			
	Martensitic, heat-treated	330	1110	P15	3	2	2	E			

Walter Select HSS-E (-PM) taps

Material group	WALTER SELECT Primary application Other application Overview of the main material groups and code letters						Machining					
							Thread depth		1 × D _N			
							Designation		Prototex® OS		MMB	
							Coolant supply		External		External	
							Coating / grade		Uncoated		Uncoated	
							Thread type Page		M B 748		M B 775	
							Brinell hardness HB	Tensile strength R _m N/mm²	Machining group			
P	Non-alloyed steel	C ≤ 0.25%	Annealed	125	430	P1	●	●				
		C > 0.25... ≤ 0.55%	Annealed	190	640	P2	●	●				
		C > 0.25... ≤ 0.55%	Heat-treated	210	710	P3	●	●				
		C > 0.55%	Annealed	190	640	P4	●	●				
		C > 0.55%	Heat-treated	300	1010	P5						
	Low-alloyed steel	Free cutting steel (short-chipping)	Annealed	220	750	P6	●	●				
		Annealed		175	590	P7	●	●				
		Heat-treated		285	960	P8						
		Heat-treated		380	1280	P9						
	High-alloyed steel and high-alloyed tool steel	Heat-treated		430	1480	P10						
		Annealed		200	680	P11						
		Hardened and tempered		300	1010	P12						
	Stainless steel	Hardened and tempered		380	1280	P13						
		Ferritic/martensitic, annealed		200	680	P14						
		Martensitic, heat-treated		330	1110	P15						
M		Stainless steel	Austenitic, quench hardened		200	680	M1					
	Austenitic, precipitation hardened (PH)			300	1010	M2						
	Austenitic/ferritic, duplex			230	780	M3						
	K	Malleable cast iron	Ferritic		200	400	K1					
Pearlitic				260	700	K2						
Grey cast iron		Low tensile strength		180	200	K3						
		High tensile strength/austenitic		245	350	K4						
Cast iron with spheroidal graphite		Ferritic		155	400	K5						
		Pearlitic		265	700	K6						
GGV (CGI)			230	400	K7							
N	Wrought aluminium alloys	Not hardenable		30	-	N1	●					
		Hardenable, hardened		100	340	N2	●					
	Cast aluminium alloys	≤ 12% Si, not hardenable		75	260	N3						
		≤ 12% Si, hardenable, hardened		90	310	N4						
		> 12% Si, not hardenable		130	450	N5						
	Magnesium-based alloys			70	250	N6						
	Copper and copper alloys (bronze/brass)	Non-alloyed, electrolytic copper		100	340	N7						
		Brass, bronze, red brass		90	310	N8						
Cu-alloys, short-chipping			110	380	N9							
High-tensile, Ampco			300	1010	N10							
S	Heat-resistant alloys	Fe-based	Annealed	200	680	S1						
			Hardened	280	940	S2						
		Ni or Co base	Annealed	250	840	S3						
			Hardened	350	1180	S4						
			Cast	320	1080	S5						
	Titanium alloys	Pure titanium		200	680	S6						
		α and β alloys, hardened		375	1260	S7						
		β alloys		410	1400	S8						
	Tungsten alloys			300	1010	S9						
	Molybdenum alloys			300	1010	S10						
H	Hardened steel			<63 HRC	-	H1-H4						
O	Plastics, graphite					01-06						

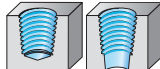
HSS-E (-PM) taps B 729

Walter Select HSS-E (-PM) taps

Material group	WALTER SELECT ●● Primary application ● Other application Overview of the main material groups and code letters				Machining									
					Thread depth			3 × D _N						
					Designation			Prototex® Synchrospeed		Paradur® N				
					Coolant supply			External		External				
					Coating / grade			THL / TIN		Uncoated				
					Thread type Page			M MF G		B 747 B 839 B 926	M B 749			
					Brinell hardness HB			Tensile strength R _m N/mm²		Machining group				
P	Non-alloyed steel	C ≤ 0.25%	Annealed	125	430	P1	●●	●●						
		C > 0.25... ≤ 0.55%	Annealed	190	640	P2	●●	●●						
		C > 0.25... ≤ 0.55%	Heat-treated	210	710	P3	●●	●						
		C > 0.55%	Annealed	190	640	P4	●●	●						
		C > 0.55%	Heat-treated	300	1010	P5	●●	●						
		Free cutting steel (short-chipping)	Annealed	220	750	P6	●●	●						
	Low-alloyed steel	Annealed		175	590	P7	●●	●						
		Heat-treated		285	960	P8	●●	●						
		Heat-treated		380	1280	P9	●●							
		Heat-treated		430	1480	P10								
	High-alloyed steel and high-alloyed tool steel	Annealed		200	680	P11	●●	●						
		Hardened and tempered		300	1010	P12	●●	●						
		Hardened and tempered		380	1280	P13	●●							
	Stainless steel	Ferritic/martensitic, annealed		200	680	P14	●●							
		Martensitic, heat-treated		330	1110	P15	●●							
M	Stainless steel	Austenitic, quench hardened		200	680	M1	●●							
		Austenitic, precipitation hardened (PH)		300	1010	M2	●●							
		Austenitic/ferritic, duplex		230	780	M3	●●							
K	Malleable cast iron	Ferritic		200	400	K1	●●	●						
		Pearlitic		260	700	K2	●●	●						
	Grey cast iron	Low tensile strength		180	200	K3	●							
		High tensile strength/austenitic		245	350	K4	●							
	Cast iron with spheroidal graphite	Ferritic		155	400	K5	●●	●						
		Pearlitic		265	700	K6	●●	●						
	GGV (CGI)			230	400	K7	●							
N	Wrought aluminium alloys	Not hardenable		30	-	N1	●●	●						
		Hardenable, hardened		100	340	N2	●●	●						
	Cast aluminium alloys	≤ 12% Si, not hardenable		75	260	N3	●●	●						
		≤ 12% Si, hardenable, hardened		90	310	N4	●●	●						
		> 12% Si, not hardenable		130	450	N5								
	Magnesium-based alloys			70	250	N6	●●							
		Non-alloyed, electrolytic copper		100	340	N7	●	●						
	Copper and copper alloys (bronze/brass)	Brass, bronze, red brass		90	310	N8	●	●						
		Cu-alloys, short-chipping		110	380	N9	●							
		High-tensile, Ampco		300	1010	N10								
S	Heat-resistant alloys	Fe-based	Annealed	200	680	S1	●							
			Hardened	280	940	S2	●							
		Ni or Co base	Annealed	250	840	S3	●							
			Hardened	350	1180	S4	●							
			Cast	320	1080	S5	●							
	Titanium alloys	Pure titanium		200	680	S6	●	●						
		α and β alloys, hardened		375	1260	S7								
		β alloys		410	1400	S8								
	Tungsten alloys			300	1010	S9								
	Molybdenum alloys			300	1010	S10								
H	Hardened steel			<63 HRC	-	H1-H4								
O	Plastics, graphite					O1-O6	●●							

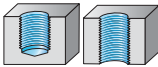
B5

Walter Select HSS-E (-PM) taps

Material group	WALTER SELECT ●● Primary application ● Other application						Machining								
							Thread depth			3,5 × D _N					
							Designation			Prototex® Eco Plus		Paradur® H			
							Coolant supply			External / radial		External			
							Coating / grade			THL / TIN		Uncoated			
							Thread type Page			M MF UNC UNF G		B 742 B 836 B 879 B 902 B 925		NPT NPTF B 944 B 949	
							Brinell hardness HB	Tensile strength R _m N/mm²	Machining group						
Overview of the main material groups and code letters															
P	Non-alloyed steel	C ≤ 0.25%	Annealed	125	430	P1	●●	●●							
		C > 0.25... ≤ 0.55%	Annealed	190	640	P2	●●	●●							
		C > 0.25... ≤ 0.55%	Heat-treated	210	710	P3	●●	●●							
		C > 0.55%	Annealed	190	640	P4	●●	●●							
		C > 0.55%	Heat-treated	300	1010	P5	●●	●							
		Free cutting steel (short-chipping)	Annealed	220	750	P6	●●	●●							
	Low-alloyed steel	Annealed		175	590	P7	●●	●●							
		Heat-treated		285	960	P8	●●	●							
		Heat-treated		380	1280	P9	●●								
		Heat-treated		430	1480	P10									
	High-alloyed steel and high-alloyed tool steel	Annealed		200	680	P11	●●	●●							
		Hardened and tempered		300	1010	P12	●●	●							
		Hardened and tempered		380	1280	P13	●●								
	Stainless steel	Ferritic/martensitic, annealed		200	680	P14	●●								
		Martensitic, heat-treated		330	1110	P15	●●								
M		Stainless steel	Austenitic, quench hardened		200	680	M1	●●							
	Austenitic, precipitation hardened (PH)			300	1010	M2	●●								
	Austenitic/ferritic, duplex			230	780	M3	●●								
	K	Malleable cast iron	Ferritic		200	400	K1	●●	●						
Pearlitic				260	700	K2	●●	●							
Grey cast iron		Low tensile strength		180	200	K3	●	●							
		High tensile strength/austenitic		245	350	K4	●	●							
Cast iron with spheroidal graphite		Ferritic		155	400	K5	●●	●							
		Pearlitic		265	700	K6	●●	●							
GGV (CGI)			230	400	K7	●	●								
N	Wrought aluminium alloys	Not hardenable		30	-	N1									
		Hardenable, hardened		100	340	N2	●●								
	Cast aluminium alloys	≤ 12% Si, not hardenable		75	260	N3	●●	●							
		≤ 12% Si, hardenable, hardened		90	310	N4	●●	●							
		> 12% Si, not hardenable		130	450	N5	●	●							
	Magnesium-based alloys			70	250	N6		●							
	Copper and copper alloys (bronze/brass)	Non-alloyed, electrolytic copper		100	340	N7	●								
		Brass, bronze, red brass		90	310	N8	●	●							
		Cu-alloys, short-chipping		110	380	N9	●	●							
		High-tensile, Ampco		300	1010	N10									
S	Heat-resistant alloys	Fe-based	Annealed	200	680	S1									
			Hardened	280	940	S2									
		Ni or Co base	Annealed	250	840	S3									
			Hardened	350	1180	S4									
			Cast	320	1080	S5									
	Titanium alloys	Pure titanium		200	680	S6									
		α and β alloys, hardened		375	1260	S7									
		β alloys		410	1400	S8									
	Tungsten alloys			300	1010	S9									
	Molybdenum alloys			300	1010	S10									
H	Hardened steel			<63 HRC	-	H1-H4									
O	Plastics, graphite					01-06		●							

B5

Walter Select HSS-E (-PM) taps

Material group	WALTER SELECT ●● Primary application ● Other application Overview of the main material groups and code letters						Machining					
							Thread depth			2 × D _N		
							Designation			HGB	HGB Inox	
							Coolant supply			External	External	
							Coating / grade			Uncoated	VAP	
							Thread type Page			M B 769	M B 770	
							Brinell hardness HB	Tensile strength R _m N/mm²	Machining group			
P	Non-alloyed steel	C ≤ 0.25%	Annealed	125	430	P1	●					
		C > 0.25... ≤ 0.55%	Annealed	190	640	P2	●					
		C > 0.25... ≤ 0.55%	Heat-treated	210	710	P3	●					
		C > 0.55%	Annealed	190	640	P4	●					
		C > 0.55%	Heat-treated	300	1010	P5						
	Low-alloyed steel	Free cutting steel (short-chipping)	Annealed	220	750	P6	●					
		Annealed		175	590	P7	●					
		Heat-treated		285	960	P8		●				
		Heat-treated		380	1280	P9		●				
	High-alloyed steel and high-alloyed tool steel	Heat-treated		430	1480	P10						
		Annealed		200	680	P11	●					
		Hardened and tempered		300	1010	P12		●				
	Stainless steel	Hardened and tempered		380	1280	P13		●				
		Ferritic/martensitic, annealed		200	680	P14		●				
		Martensitic, heat-treated		330	1110	P15		●				
M		Stainless steel	Austenitic, quench hardened		200	680	M1		●			
	Austenitic, precipitation hardened (PH)			300	1010	M2		●				
	Austenitic/ferritic, duplex			230	780	M3		●				
	K	Malleable cast iron	Ferritic		200	400	K1	●				
Pearlitic				260	700	K2	●					
Grey cast iron		Low tensile strength		180	200	K3	●					
		High tensile strength/austenitic		245	350	K4	●					
Cast iron with spheroidal graphite		Ferritic		155	400	K5	●					
		Pearlitic		265	700	K6	●					
N	GGV (CGI)			230	400	K7	●					
	Wrought aluminium alloys	Not hardenable		30	-	N1	●					
		Hardenable, hardened		100	340	N2	●					
	Cast aluminium alloys	≤ 12% Si, not hardenable		75	260	N3	●					
		≤ 12% Si, hardenable, hardened		90	310	N4	●					
		> 12% Si, not hardenable		130	450	N5	●					
	Magnesium-based alloys			70	250	N6	●					
	Copper and copper alloys (bronze/brass)	Non-alloyed, electrolytic copper		100	340	N7	●					
		Brass, bronze, red brass		90	310	N8	●					
		Cu-alloys, short-chipping		110	380	N9	●					
High-tensile, Ampco			300	1010	N10							
S	Heat-resistant alloys	Fe-based	Annealed	200	680	S1						
			Hardened	280	940	S2						
		Ni or Co base	Annealed	250	840	S3						
			Hardened	350	1180	S4						
			Cast	320	1080	S5						
	Titanium alloys	Pure titanium		200	680	S6						
		α and β alloys, hardened		375	1260	S7						
		β alloys		410	1400	S8						
	Tungsten alloys			300	1010	S9						
	Molybdenum alloys			300	1010	S10						
H	Hardened steel			<63 HRC	-	H1-H4						
O	Plastics, graphite					01-06						

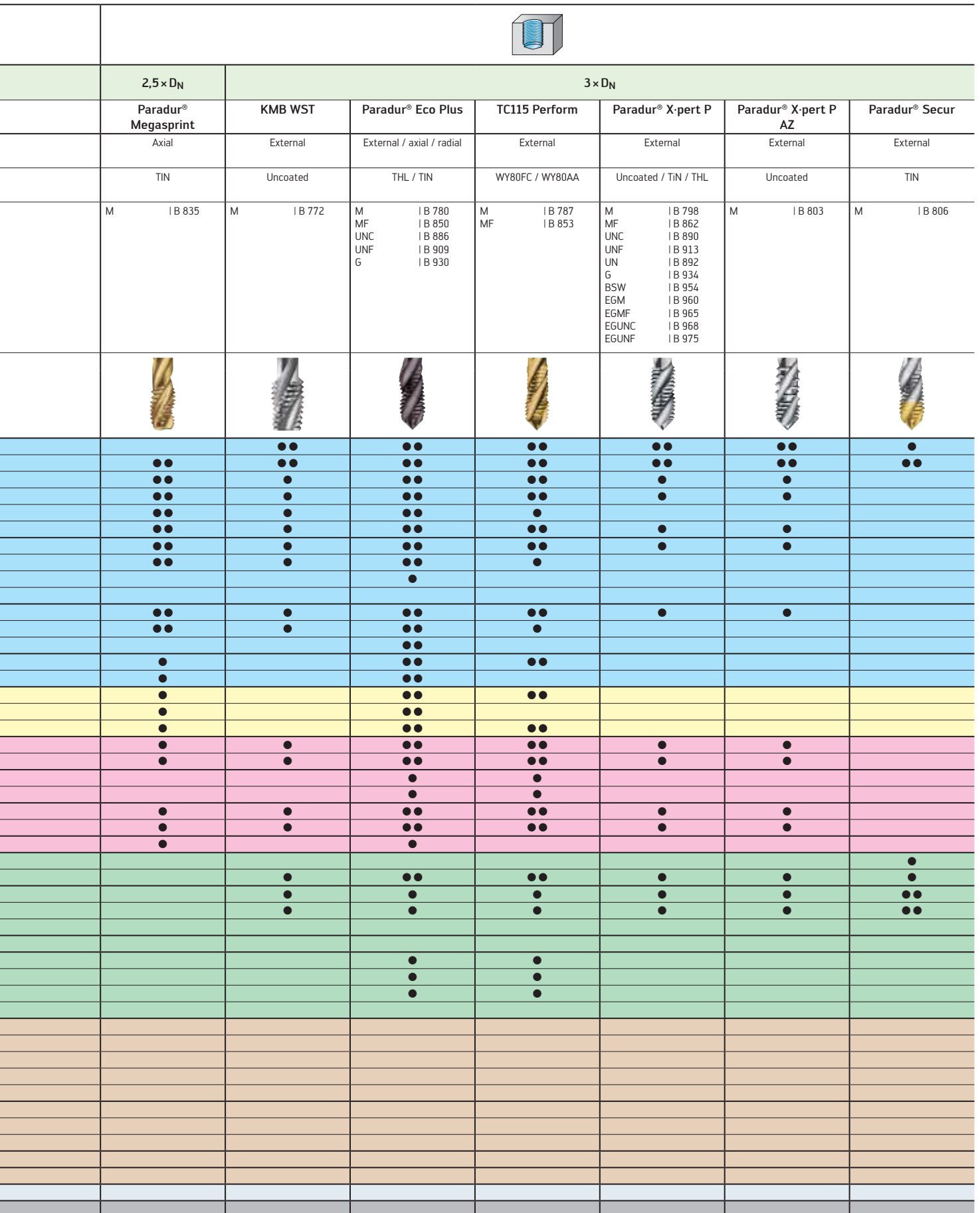
B5

Walter Select HSS-E (-PM) taps

Material group	WALTER SELECT ●● Primary application ● Other application				Machining								
					Thread depth			1,5 × D _N					
					Designation			Paradur Inox® 25		Paradur® Ni			
					Coolant supply			External		External			
					Coating / grade			TIN		Uncoated			
					Thread type Page			M MF G		B 813 B 870 B 938 M UNC UNF EGM EGUNF B 826 B 898 B 916 B 963 B 978			
					Brinell hardness HB			Tensile strength R _m N/mm²		Machining group			
					Overview of the main material groups and code letters								
P	Non-alloyed steel	C ≤ 0.25%	Annealed	125	430	P1							
		C > 0.25... ≤ 0.55%	Annealed	190	640	P2							
		C > 0.25... ≤ 0.55%	Heat-treated	210	710	P3	●						
		C > 0.55%	Annealed	190	640	P4	●						
		C > 0.55%	Heat-treated	300	1010	P5	●●						
		Free cutting steel (short-chipping)	Annealed	220	750	P6	●						
	Low-alloyed steel	Annealed		175	590	P7	●						
		Heat-treated		285	960	P8	●●						
		Heat-treated		380	1280	P9		●					
		Heat-treated		430	1480	P10		●					
	High-alloyed steel and high-alloyed tool steel	Annealed		200	680	P11	●						
		Hardened and tempered		300	1010	P12	●●						
		Hardened and tempered		380	1280	P13		●					
	Stainless steel	Ferritic/martensitic, annealed		200	680	P14	●						
		Martensitic, heat-treated		330	1110	P15	●	●					
M	Stainless steel	Austenitic, quench hardened		200	680	M1	●						
		Austenitic, precipitation hardened (PH)		300	1010	M2	●	●					
		Austenitic/ferritic, duplex		230	780	M3	●	●					
K	Malleable cast iron	Ferritic		200	400	K1	●						
		Pearlitic		260	700	K2	●						
	Grey cast iron	Low tensile strength		180	200	K3	●						
		High tensile strength/austenitic		245	350	K4	●						
	Cast iron with spheroidal graphite	Ferritic		155	400	K5	●						
		Pearlitic		265	700	K6	●						
	GGV (CGI)			230	400	K7	●						
N	Wrought aluminium alloys	Not hardenable		30	-	N1							
		Hardenable, hardened		100	340	N2							
	Cast aluminium alloys	≤ 12% Si, not hardenable		75	260	N3		●					
		≤ 12% Si, hardenable, hardened		90	310	N4		●					
		> 12% Si, not hardenable		130	450	N5		●					
	Magnesium-based alloys			70	250	N6							
		Non-alloyed, electrolytic copper		100	340	N7							
	Copper and copper alloys (bronze/brass)	Brass, bronze, red brass		90	310	N8							
		Cu-alloys, short-chipping		110	380	N9							
		High-tensile, Ampco		300	1010	N10							
S	Heat-resistant alloys	Fe-based	Annealed	200	680	S1		●●					
			Hardened	280	940	S2		●●					
		Ni or Co base	Annealed	250	840	S3		●●					
			Hardened	350	1180	S4		●●					
			Cast	320	1080	S5		●●					
	Titanium alloys	Pure titanium		200	680	S6							
		α and β alloys, hardened		375	1260	S7							
		β alloys		410	1400	S8							
	Tungsten alloys			300	1010	S9		●●					
	Molybdenum alloys			300	1010	S10		●					
H	Hardened steel		<63 HRC	-	H1-H4								
O	Plastics, graphite				O1-O6								

HSS-E (-PM) taps B 737

Material group	WALTER SELECT ●● Primary application ● Other application				Machining									
					Thread depth		2,5 × D _N							
					Designation		Paradur® STE	Paradur® X-pert M						
					Coolant supply		External	External						
					Coating / grade		THL / uncoated	TICN / TIN / VAP / THL						
					Thread type Page		M MF G	B 808 B 866 B 935	M MF UNC UNF UN G EGM EGUNC EGUNF	B 810 B 868 B 893 B 914 B 894 B 937 B 961 B 969 B 976				
					Brinell hardness HB	Tensile strength R _m N/mm²	Machining group							
					Overview of the main material groups and code letters									
					P	Non-alloyed steel	C ≤ 0.25%	Annealed	125	430	P1			
							C > 0.25... ≤ 0.55%	Annealed	190	640	P2	●●	●●	
C > 0.25... ≤ 0.55%	Heat-treated	210	710	P3			●●	●●						
C > 0.55%	Annealed	190	640	P4			●●	●●						
C > 0.55%	Heat-treated	300	1010	P5				●●						
Free cutting steel (short-chipping)	Annealed	220	750	P6			●	●●						
Low-alloyed steel	Annealed	175	590	P7		●	●●							
	Heat-treated	285	960	P8			●●							
	Heat-treated	380	1280	P9										
	Heat-treated	430	1480	P10										
High-alloyed steel and high-alloyed tool steel	Annealed	200	680	P11		●	●●							
	Hardened and tempered	300	1010	P12			●●							
	Hardened and tempered	380	1280	P13										
Stainless steel	Ferritic/martensitic, annealed	200	680	P14		●●								
	Martensitic, heat-treated	330	1110	P15		●●								
M	Stainless steel	Austenitic, quench hardened	200	680	M1		●●							
		Austenitic, precipitation hardened (PH)	300	1010	M2		●●							
		Austenitic/ferritic, duplex	230	780	M3		●●							
K	Malleable cast iron	Ferritic	200	400	K1	●●	●							
		Pearlitic	260	700	K2	●●	●							
	Grey cast iron	Low tensile strength	180	200	K3									
		High tensile strength/austenitic	245	350	K4									
	Cast iron with spheroidal graphite	Ferritic	155	400	K5	●●	●							
		Pearlitic	265	700	K6	●●	●							
GGV (CGI)		230	400	K7		●								
N	Wrought aluminium alloys	Not hardenable	30	-	N1									
		Hardenable, hardened	100	340	N2									
	Cast aluminium alloys	≤ 12% Si, not hardenable	75	260	N3									
		≤ 12% Si, hardenable, hardened	90	310	N4									
		> 12% Si, not hardenable	130	450	N5									
	Magnesium-based alloys		70	250	N6									
	Copper and copper alloys (bronze/brass)	Non-alloyed, electrolytic copper	100	340	N7									
		Brass, bronze, red brass	90	310	N8									
Cu-alloys, short-chipping		110	380	N9										
High-tensile, Ampco		300	1010	N10										
S	Heat-resistant alloys	Fe-based	Annealed	200	680	S1								
			Hardened	280	940	S2								
		Ni or Co base	Annealed	250	840	S3								
			Hardened	350	1180	S4								
			Cast	320	1080	S5								
	Titanium alloys	Pure titanium	200	680	S6									
		α and β alloys, hardened	375	1260	S7									
		β alloys	410	1400	S8									
	Tungsten alloys		300	1010	S9									
Molybdenum alloys		300	1010	S10										
H	Hardened steel		<63 HRC	-	H1-H4									
O	Plastics, graphite				01-06									



Walter Select HSS-E (-PM) taps

Material group	WALTER SELECT ● ● Primary application ● Other application			Machining							
				Thread depth			3 × D _N				
				Designation			TC142 Supreme		Paradur® Eco Cl		
				Coolant supply			External		Axial / radial		
				Coating / grade			WY80FC / WW60RB		TiCN		
				Thread type Page			M MF G		I B 809 I B 867 I B 936	M MF I B 815 I B 872	
				Brinell hardness HB			Tensile strength R _m N/mm ²		Machining group		
Overview of the main material groups and code letters											
P	Non-alloyed steel	C ≤ 0.25%	Annealed	125	430	P1					
		C > 0.25... ≤ 0.55%	Annealed	190	640	P2					
		C > 0.25... ≤ 0.55%	Heat-treated	210	710	P3	●				
		C > 0.55%	Annealed	190	640	P4	●				
		C > 0.55%	Heat-treated	300	1010	P5	●				
		Free cutting steel (short-chipping)	Annealed	220	750	P6	●				
	Low-alloyed steel	Annealed		175	590	P7	●				
		Heat-treated		285	960	P8	●				
		Heat-treated		380	1280	P9					
		Heat-treated		430	1480	P10					
	High-alloyed steel and high-alloyed tool steel	Annealed		200	680	P11	●				
		Hardened and tempered		300	1010	P12					
		Hardened and tempered		380	1280	P13					
	Stainless steel	Ferritic/martensitic, annealed		200	680	P14	● ●				
		Martensitic, heat-treated		330	1110	P15					
M	Stainless steel	Austenitic, quench hardened		200	680	M1	● ●				
		Austenitic, precipitation hardened (PH)		300	1010	M2					
		Austenitic/ferritic, duplex		230	780	M3	● ●				
K	Malleable cast iron	Ferritic		200	400	K1		● ●			
		Pearlitic		260	700	K2		● ●			
	Grey cast iron	Low tensile strength		180	200	K3		● ●			
		High tensile strength/austenitic		245	350	K4		● ●			
	Cast iron with spheroidal graphite	Ferritic		155	400	K5		● ●			
		Pearlitic		265	700	K6		● ●			
GGV (CGI)			230	400	K7		● ●				
N	Wrought aluminium alloys	Not hardenable		30	-	N1					
		Hardenable, hardened		100	340	N2					
	Cast aluminium alloys	≤ 12% Si, not hardenable		75	260	N3		● ●			
		≤ 12% Si, hardenable, hardened		90	310	N4		● ●			
		> 12% Si, not hardenable		130	450	N5		● ●			
	Magnesium-based alloys			70	250	N6		● ●			
		Non-alloyed, electrolytic copper		100	340	N7					
	Copper and copper alloys (bronze/brass)	Brass, bronze, red brass		90	310	N8					
		Cu-alloys, short-chipping		110	380	N9					
High-tensile, Ampco			300	1010	N10						
S	Heat-resistant alloys	Fe-based	Annealed	200	680	S1					
			Hardened	280	940	S2					
		Ni or Co base	Annealed	250	840	S3					
			Hardened	350	1180	S4					
			Cast	320	1080	S5					
	Titanium alloys	Pure titanium		200	680	S6					
		α and β alloys, hardened		375	1260	S7					
		β alloys		410	1400	S8					
	Tungsten alloys			300	1010	S9					
	Molybdenum alloys			300	1010	S10					
H	Hardened steel		<63 HRC	-	H1-H4						
O	Plastics, graphite				01-06		● ●				

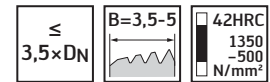
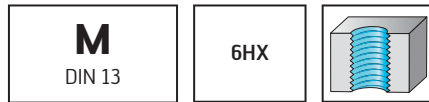
B5

HSS-E-PM machine taps

Prototex® Eco Plus

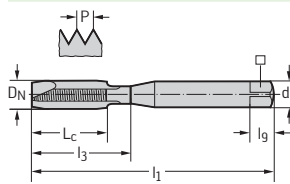


– For long-chipping materials



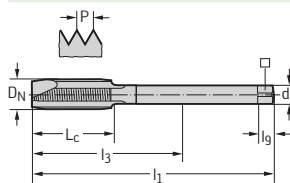
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THL	●	●	●	●	●	●	●
TIN	●	●	●	●	●	●	●

DIN 371



Designation THL	Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
EP2021302-M2	EP2021305-M2	M 2	0,4	45	6	9	2,8	2,1	5	3
EP2021302-M2.5	EP2021305-M2.5	M 2.5	0,45	50	8	12,5	2,8	2,1	5	3
EP2021302-M3	EP2021305-M3	M 3	0,5	56	9	18	3,5	2,7	6	3
EP2021302-M4	EP2021305-M4	M 4	0,7	63	12	21	4,5	3,4	6	3
EP2021302-M5	EP2021305-M5	M 5	0,8	70	13	25	6	4,9	8	3
EP2021302-M6	EP2021305-M6	M 6	1	80	15	30	6	4,9	8	3
EP2021302-M8	EP2021305-M8	M 8	1,25	90	18	35	8	6,2	9	3
EP2021302-M10	EP2021305-M10	M 10	1,5	100	20	39	10	8	11	3

DIN 376



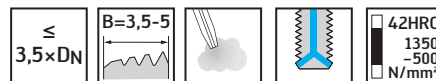
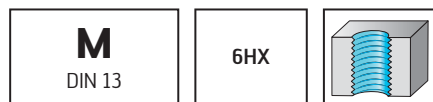
Designation THL	Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
EP2026302-M12	EP2026305-M12	M 12	1,75	110	23	83	9	7	10	4
EP2026302-M14	EP2026305-M14	M 14	2	110	25	81	11	9	12	4
EP2026302-M16	EP2026305-M16	M 16	2	110	25	68	12	9	12	4
EP2026302-M18	EP2026305-M18	M 18	2,5	125	30	81	14	11	14	4
EP2026302-M20	EP2026305-M20	M 20	2,5	140	30	95	16	12	15	4
EP2026302-M24	EP2026305-M24	M 24	3	160	36	113	18	14,5	17	4
EP2026302-M27		M 27	3	160	36	97	20	16	19	4
EP2026302-M30		M 30	3,5	180	42	115	22	18	21	4

HSS-E-PM machine taps

Prototex® Eco Plus

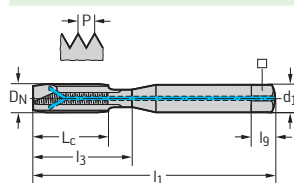


– For long-chipping materials



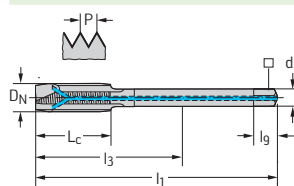
	P	M	K	N	S	H	O
THL	●	●	●	●			

DIN 371

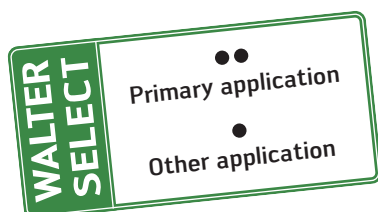


Designation THL	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
EP2021342-M6	M 6	1	80	15	30	6	4,9	8	3
EP2021342-M8	M 8	1,25	90	18	35	8	6,2	9	3
EP2021342-M10	M 10	1,5	100	20	39	10	8	11	3

DIN 376



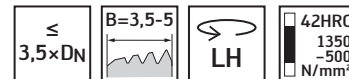
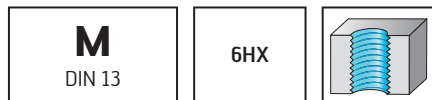
Designation THL	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
EP2026342-M12	M 12	1,75	110	23	83	9	7	10	4
EP2026342-M16	M 16	2	110	25	68	12	9	12	4



HSS-E-PM machine taps Prototex® Eco Plus

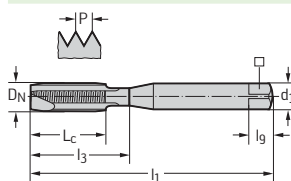


– For long-chipping materials



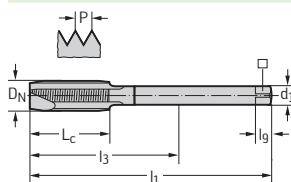
	P	M	K	N	S	H	O
THL	●	●	●	●			

DIN 371



Designation THL	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
EP2021382-M3	M 3 - LH	0,5	56	9	18	3,5	2,7	6	3
EP2021382-M4	M 4 - LH	0,7	63	12	21	4,5	3,4	6	3
EP2021382-M5	M 5 - LH	0,8	70	13	25	6	4,9	8	3
EP2021382-M6	M 6 - LH	1	80	15	30	6	4,9	8	3
EP2021382-M8	M 8 - LH	1,25	90	18	35	8	6,2	9	3
EP2021382-M10	M 10 - LH	1,5	100	20	39	10	8	11	3

DIN 376



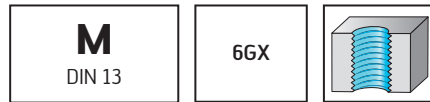
Designation THL	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
EP2026382-M12	M 12 - LH	1,75	110	23	83	9	7	10	4
EP2026382-M16	M 16 - LH	2	110	25	68	12	9	12	4
EP2026382-M20	M 20 - LH	2,5	140	30	95	16	12	15	4

HSS-E-PM machine taps

Prototex® Eco Plus

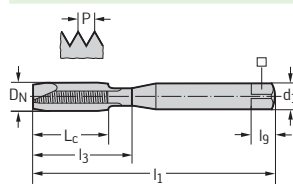


– For long-chipping materials



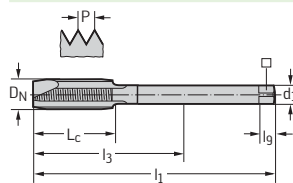
	P	M	K	N	S	H	O
THL	●	●	●	●			
TIN	●	●	●	●			

DIN 371

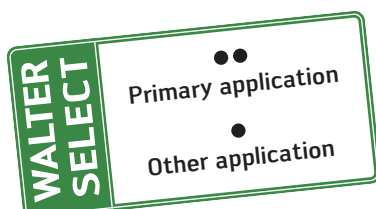


Designation THL	Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
EP2023302-M2	EP2023305-M2	M 2	0,4	45	6	9	2,8	2,1	5	3
EP2023302-M2.5	EP2023305-M2.5	M 2.5	0,45	50	8	12,5	2,8	2,1	5	3
EP2023302-M3	EP2023305-M3	M 3	0,5	56	9	18	3,5	2,7	6	3
EP2023302-M4	EP2023305-M4	M 4	0,7	63	12	21	4,5	3,4	6	3
EP2023302-M5	EP2023305-M5	M 5	0,8	70	13	25	6	4,9	8	3
EP2023302-M6	EP2023305-M6	M 6	1	80	15	30	6	4,9	8	3
EP2023302-M8	EP2023305-M8	M 8	1,25	90	18	35	8	6,2	9	3
EP2023302-M10	EP2023305-M10	M 10	1,5	100	20	39	10	8	11	3

DIN 376

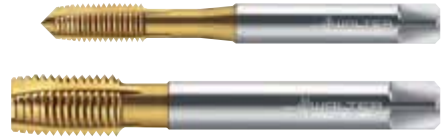


Designation THL	Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
EP2028302-M12	EP2028305-M12	M 12	1,75	110	23	83	9	7	10	4
EP2028302-M14	EP2028305-M14	M 14	2	110	25	81	11	9	12	4
EP2028302-M16	EP2028305-M16	M 16	2	110	25	68	12	9	12	4

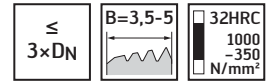
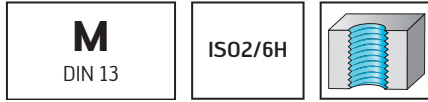


HSS-E machine taps

TC216 Perform

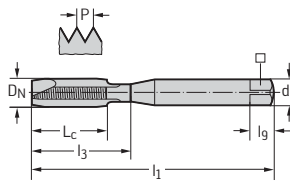


– For long-chipping materials



	P	M	K	N	S	H	O
WY80AA	●	●	●	●	●	●	●
WY80FC	●	●	●	●	●	●	●

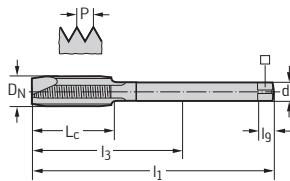
DIN 371



Designation	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N	WY80AA	WY80FC
TC216-M3-C0-	M 3	0,5	56	9	18	3,5	2,7	6	2	●	●
TC216-M4-C0-	M 4	0,7	63	12	21	4,5	3,4	6	3	●	●
TC216-M5-C0-	M 5	0,8	70	13	25	6	4,9	8	3	●	●
TC216-M6-C0-	M 6	1	80	15	30	6	4,9	8	3	●	●
TC216-M8-C0-	M 8	1,25	90	18	35	8	6,2	9	3	●	●
TC216-M10-C0-	M 10	1,5	100	20	39	10	8	11	3	●	●

Ordering example for the WY80FC grade: TC216-M3-C0-WY80FC

DIN 376



Designation	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N	WY80AA	WY80FC
TC216-M12-L0-	M 12	1,75	110	23	83	9	7	10	3	●	●
TC216-M14-L0-	M 14	2	110	25	81	11	9	12	4	●	●
TC216-M16-L0-	M 16	2	110	25	68	12	9	12	4	●	●
TC216-M20-L0-	M 20	2,5	140	30	95	16	12	15	4	●	●

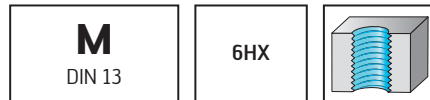
Ordering example for the WY80FC grade: TC216-M12-L0-WY80FC

HSS-E machine taps

Prototex® Synchrospeed



- For long-chipping materials
- Only for synchronous machining (rigid tapping)

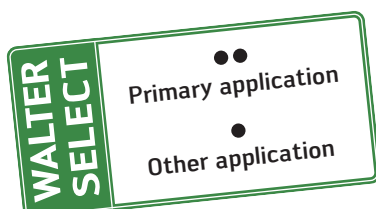


	P	M	K	N	S	H	O
THL	●	●	●	●	●		●
TIN	●	●	●	●	●		●

~DIN 371	Designation THL	Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	mm	l _g mm	N
	S2021302-M2	S2021305-M2	M 2	0,4	70	4	9	6	4,9	8	3
	S2021302-M2.5	S2021305-M2.5	M 2.5	0,45	70	5	12,5	6	4,9	8	3
	S2021302-M3	S2021305-M3	M 3	0,5	70	5	18	6	4,9	8	3
	S2021302-M4	S2021305-M4	M 4	0,7	70	7	21	6	4,9	8	3
	S2021302-M5	S2021305-M5	M 5	0,8	70	8	25	6	4,9	8	3
	S2021302-M6	S2021305-M6	M 6	1	80	10	30	6	4,9	8	3
	S2021302-M8	S2021305-M8	M 8	1,25	90	13	35	8	6,2	9	3
	S2021302-M10	S2021305-M10	M 10	1,5	100	15	39	10	8	11	3

~DIN 376	Designation THL	Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	mm	l _g mm	N
	S2026302-M12	S2026305-M12	M 12	1,75	110	18	68	12	9	12	3
	S2026302-M14	S2026305-M14	M 14	2	110	20	66	14	11	14	3
	S2026302-M16	S2026305-M16	M 16	2	110	20	65	16	12	15	4
	S2026302-M20	S2026305-M20	M 20	2,5	140	25	95	16	12	15	4
	S2026302-M24	S2026305-M24	M 24	3	160	30	97	20	16	19	4

B 5

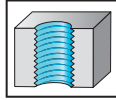


HSS-E machine taps

Prototex® OS

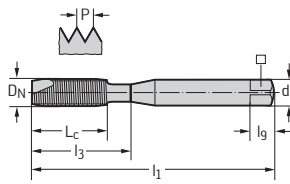


– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●●			●			

DIN 371



Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
20211-M1	M 1	0,25	40	5	5	2,5	2,1	5	2
20211-M1.2	M 1.2	0,25	40	5	5	2,5	2,1	5	2
20211-M1.4	M 1.4	0,3	40	7	6,5	2,5	2,1	5	2
20211-M1.6	M 1.6	0,35	40	7	7	2,5	2,1	5	2
20211-M1.7	M 1.7	0,35	40	7	7	2,5	2,1	5	2
20211-M1.8	M 1.8	0,35	40	7	7	2,5	2,1	5	2
20211-M2	M 2	0,4	45	6	9	2,8	2,1	5	2
20211-M2.5	M 2.5	0,45	50	8	12,5	2,8	2,1	5	2
20211-M2.6	M 2.6	0,45	50	8	12,5	2,8	2,1	5	2
20211-M3	M 3	0,5	56	9	18	3,5	2,7	6	2
20211-M4	M 4	0,7	63	12	21	4,5	3,4	6	2
20211-M5	M 5	0,8	70	13	25	6	4,9	8	2
20211-M6	M 6	1	80	15	30	6	4,9	8	3
20211-M8	M 8	1,25	90	18	35	8	6,2	9	3
20211-M10	M 10	1,5	100	20	39	10	8	11	3

≤ M 1.4: 5H

≤ M 1.8: Without reduced neck after the thread

B5

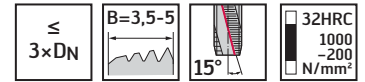


HSS-E machine taps

Paradur® N

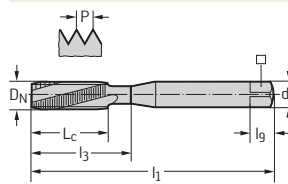


– For long-chipping materials



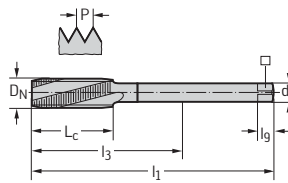
	P	M	K	N	S	H	O
Uncoated	●●	●●	●●	●●	●●	●●	●●

DIN 371

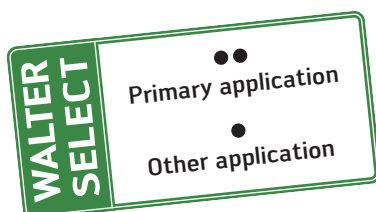


Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
20411-M3	M 3	0,5	56	9	18	3,5	2,7	6	3
20411-M4	M 4	0,7	63	12	21	4,5	3,4	6	3
20411-M5	M 5	0,8	70	13	25	6	4,9	8	3
20411-M6	M 6	1	80	15	30	6	4,9	8	3

DIN 376



Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
20461-M6	M 6	1	80	15	59	4,5	3,4	6	3
20461-M8	M 8	1,25	90	18	67	6	4,9	8	3
20461-M10	M 10	1,5	100	20	77	7	5,5	8	3
20461-M12	M 12	1,75	110	23	83	9	7	10	3



HSS-E machine taps

Prototex® X-pert P

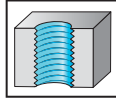


- Reduced number of flutes
- For long-chipping materials

 $\leq 3 \times D_N$
 $B=3,5-5$

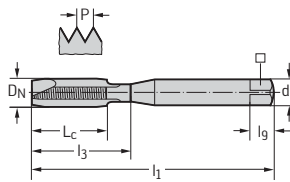
32HRC
1000
-200
N/mm²
M
DIN 13

ISO1/4H



	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

DIN 371



Designation Uncoated	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	$\square$ mm	l_g mm	N
P20200-M1.6	M 1.6	0,35	40	7	7	2,5	2,1	5	2
P20200-M2	M 2	0,4	45	6	9	2,8	2,1	5	2
P20200-M2.2	M 2.2	0,45	45	7	12	2,8	2,1	5	2
P20200-M2.5	M 2.5	0,45	50	8	12,5	2,8	2,1	5	2
P20200-M3	M 3	0,5	56	9	18	3,5	2,7	6	2
P20200-M3.5	M 3.5	0,6	56	11	20	4	3	6	2
P20200-M4	M 4	0,7	63	12	21	4,5	3,4	6	2
P20200-M5	M 5	0,8	70	13	25	6	4,9	8	2
P20200-M6	M 6	1	80	15	30	6	4,9	8	2
P20200-M8	M 8	1,25	90	18	35	8	6,2	9	3
P20200-M10	M 10	1,5	100	20	39	10	8	11	3

M 1.6: Without reduced neck after the thread

B5



B 1008



D 1



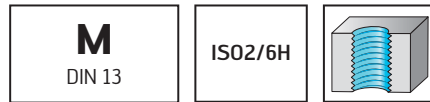
B 709

HSS-E machine taps

Prototex® X-pert P



– For long-chipping materials



	P	M	K	N	S	H	O
TICN	●●	●	●	●	●	●	●
TIN	●●	●	●	●	●	●	●
Uncoated	●●	●	●	●	●	●	●

DIN 371	Designation TICN	Designation TIN	Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	N
	P2031006-M2	P2031005-M2	P20310-M2	M 2	0,4	45	6	9	2,8	2,1	3
		P2031005-M2.2	P20310-M2.2	M 2.2	0,45	45	7	12	2,8	2,1	3
	P2031006-M2.5	P2031005-M2.5	P20310-M2.5	M 2.5	0,45	50	8	12,5	2,8	2,1	3
	P2031006-M3	P2031005-M3	P20310-M3	M 3	0,5	56	9	18	3,5	2,7	3
			P20310-M3.5	M 3.5	0,6	56	11	20	4	3	3
	P2031006-M4	P2031005-M4	P20310-M4	M 4	0,7	63	12	21	4,5	3,4	3
	P2031006-M5	P2031005-M5	P20310-M5	M 5	0,8	70	13	25	6	4,9	3
	P2031006-M6	P2031005-M6	P20310-M6	M 6	1	80	15	30	6	4,9	3
		P2031005-M7	P20310-M7	M 7	1	80	15	30	7	5,5	3
	P2031006-M8	P2031005-M8	P20310-M8	M 8	1,25	90	18	35	8	6,2	3
	P2031006-M10	P2031005-M10	P20310-M10	M 10	1,5	100	20	39	10	8	3

lg dimension in accordance with DIN 10

DIN 376	Designation TICN	Designation TIN	Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	N
			P20360-M2	M 2	0,4	45	6	26	1,4	1,1	3
			P20360-M2.5	M 2.5	0,45	50	8	31	1,8	1,4	3
			P20360-M3	M 3	0,5	56	9	37	2,2	1,8	3
			P20360-M4	M 4	0,7	63	12	43	2,8	2,1	3
			P20360-M5	M 5	0,8	70	13	49	3,5	2,7	3
	P2036006-M6	P2036005-M6	P20360-M6	M 6	1	80	15	59	4,5	3,4	3
			P20360-M7	M 7	1	80	15	58	5,5	4,3	3
	P2036006-M8	P2036005-M8	P20360-M8	M 8	1,25	90	18	67	6	4,9	3
			P20360-M9	M 9	1,25	90	18	67	7	5,5	3
	P2036006-M10	P2036005-M10	P20360-M10	M 10	1,5	100	20	77	7	5,5	3
	P2036006-M12	P2036005-M12	P20360-M12	M 12	1,75	110	23	83	9	7	3
		P2036005-M14	P20360-M14	M 14	2	110	25	81	11	9	3
	P2036006-M16	P2036005-M16	P20360-M16	M 16	2	110	25	68	12	9	3
		P2036005-M18	P20360-M18	M 18	2,5	125	30	81	14	11	4
	P2036006-M20	P2036005-M20	P20360-M20	M 20	2,5	140	30	95	16	12	4
			P20360-M22	M 22	2,5	140	30	93	18	14,5	4
	P2036006-M24	P2036005-M24	P20360-M24	M 24	3	160	36	113	18	14,5	4
		P2036005-M27	P20360-M27	M 27	3	160	36	97	20	16	4
	P2036006-M30	P2036005-M30	P20360-M30	M 30	3,5	180	42	115	22	18	4
			P20360-M33	M 33	3,5	180	42	113	25	20	4
		P2036005-M36	P20360-M36	M 36	4	200	48	131	28	22	4
			P20360-M39	M 39	4	200	48	102	32	24	4
			P20360-M42	M 42	4,5	200	54	102	32	24	4
			P20360-M45	M 45	4,5	220	54	117	36	29	4
			P20360-M48	M 48	5	250	60	147	36	29	4
			P20360-M52	M 52	5	250	60	120	40	32	4
			P20360-M56	M 56	5,5	250	66	120	40	32	4

lg dimension in accordance with DIN 10

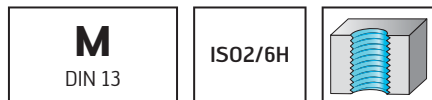
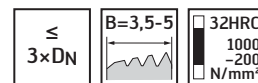
B5

HSS-E machine taps

Prototex® X-pert P

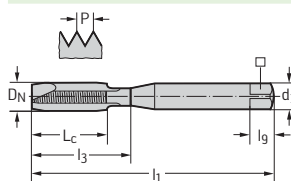


- Reduced number of flutes
- For long-chipping materials



	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●
Uncoated	●	●	●	●	●	●	●

DIN 371



Designation TIN	Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
P2021005-M1.2	P20210-M1	M 1	0,25	40	5	5	2,5	2,1	5	2
P2021005-M1.4	P20210-M1.2	M 1.2	0,25	40	5	5	2,5	2,1	5	2
P2021005-M1.6	P20210-M1.4	M 1.4	0,3	40	7	6,5	2,5	2,1	5	2
P2021005-M1.8	P20210-M1.6	M 1.6	0,35	40	7	7	2,5	2,1	5	2
P2021005-M2	P20210-M1.8	M 1.8	0,35	40	7	7	2,5	2,1	5	2
P2021005-M2.2	P20210-M2	M 2	0,4	45	6	9	2,8	2,1	5	2
P2021005-M2.3	P20210-M2.3	M 2.3	0,4	45	7	12	2,8	2,1	5	2
P2021005-M2.5	P20210-M2.2	M 2.2	0,45	45	7	12	2,8	2,1	5	2
P2021005-M2.6	P20210-M2.5	M 2.5	0,45	50	8	12,5	2,8	2,1	5	2
P2021005-M3	P20210-M2.6	M 2.6	0,45	50	8	12,5	2,8	2,1	5	2
P2021005-M3.5	P20210-M3	M 3	0,5	56	9	18	3,5	2,7	6	2
P2021005-M4	P20210-M3.5	M 3.5	0,6	56	11	20	4	3	6	2
P2021005-M4.5	P20210-M4	M 4	0,7	63	12	21	4,5	3,4	6	2
P2021005-M5	P20210-M4.5	M 4.5	0,75	70	13	25	6	4,9	8	2
P2021005-M6	P20210-M5	M 5	0,8	70	13	25	6	4,9	8	2
P2021005-M6	P20210-M6	M 6	1	80	15	30	6	4,9	8	2

≤ M 1.4: 5H

≤ M 1.8: Without reduced neck after the thread

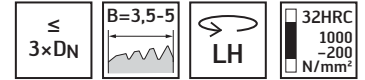


HSS-E machine taps

Prototex® X-pert P

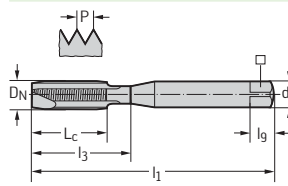


– For long-chipping materials



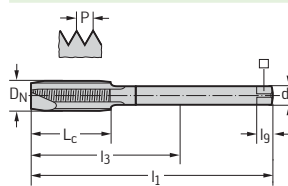
	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

DIN 371

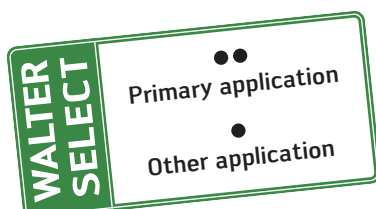


Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
P202108-M2	M 2 - LH	0,4	45	6	9	2,8	2,1	5	2
P202108-M3	M 3 - LH	0,5	56	9	18	3,5	2,7	6	2
P202108-M4	M 4 - LH	0,7	63	12	21	4,5	3,4	6	2
P202108-M5	M 5 - LH	0,8	70	13	25	6	4,9	8	2
P202108-M6	M 6 - LH	1	80	15	30	6	4,9	8	3
P202108-M8	M 8 - LH	1,25	90	18	35	8	6,2	9	3
P202108-M10	M 10 - LH	1,5	100	20	39	10	8	11	3

DIN 376



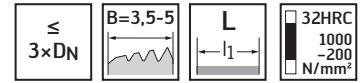
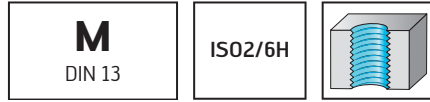
Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
P202608-M12	M 12 - LH	1,75	110	23	83	9	7	10	3
P202608-M16	M 16 - LH	2	110	25	68	12	9	12	3
P202608-M20	M 20 - LH	2,5	140	30	95	16	12	15	3



HSS-E machine taps Prototex® X-pert P



– For long-chipping materials



	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●
Uncoated	●	●	●	●	●	●	●

~DIN 371 L

Designation TIN	Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
P2031035-M3	P203103-M3	M 3	0,5	112	9	18	3,5	2,7	6	3
P2031035-M4	P203103-M4	M 4	0,7	112	12	21	4,5	3,4	6	3
P2031035-M5	P203103-M5	M 5	0,8	125	13	25	6	4,9	8	3
P2031035-M6	P203103-M6	M 6	1	125	15	30	6	4,9	8	3
P2031035-M8	P203103-M8	M 8	1,25	140	18	40	8	6,2	9	3
P2031035-M10	P203103-M10	M 10	1,5	160	20	50	10	8	11	3

~DIN 376 L

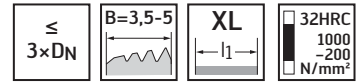
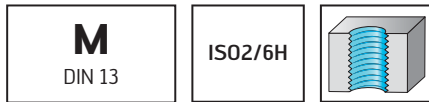
Designation TIN	Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
	P203603-M3	M 3	0,5	112	9	86	2,2	1,8	4	3
	P203603-M4	M 4	0,7	112	12	92	2,8	2,1	5	3
P2036035-M5	P203603-M5	M 5	0,8	125	13	104	3,5	2,7	6	3
P2036035-M6	P203603-M6	M 6	1	125	15	104	4,5	3,4	6	3
P2036035-M8	P203603-M8	M 8	1,25	140	18	117	6	4,9	8	3
P2036035-M10	P203603-M10	M 10	1,5	160	20	137	7	5,5	8	3
P2036035-M12	P203603-M12	M 12	1,75	180	23	153	9	7	10	3
P2036035-M14	P203603-M14	M 14	2	180	25	151	11	9	12	3
P2036035-M16	P203603-M16	M 16	2	200	25	158	12	9	12	3
P2036035-M20	P203603-M20	M 20	2,5	224	30	179	16	12	15	4



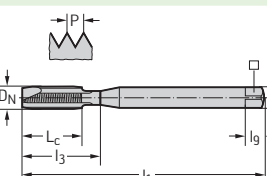
HSS-E machine taps Prototex® X-pert P



– For long-chipping materials

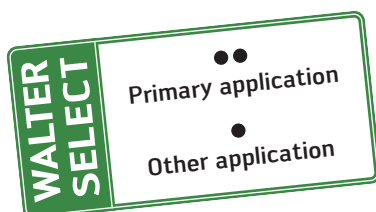


	P	M	K	N	S	H	O
Uncoated	●●	●	●	●	●	●	●

~DIN 371 XL										
	Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	 mm	l ₉ mm	N
	P202103-M4	M 4	0,7	125	12	21	4,5	3,4	6	3
	P202103-M5	M 5	0,8	140	13	25	6	4,9	8	3
	P202103-M6	M 6	1	160	15	30	6	4,9	8	3

~DIN 376 XL

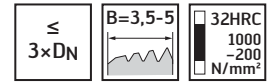
Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
P202603-M8	M 8	1,25	180	18	157	6	4,9	8	3
P202603-M10	M 10	1,5	200	20	177	7	5,5	8	3
P202603-M12	M 12	1,75	220	23	193	9	7	10	3
P202603-M14	M 14	2	220	25	191	11	9	12	3
P202603-M16	M 16	2	220	25	178	12	9	12	3
P202603-M20	M 20	2,5	280	30	235	16	12	15	4



HSS-E machine taps Prototex® X-pert P AZ

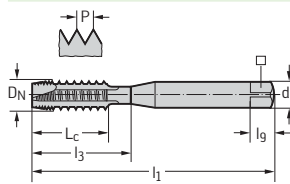


- For long-chipping materials
- For thin-walled workpieces



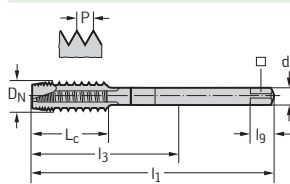
	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

DIN 371



Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
P40310-M3	M 3	0,5	56	9	18	3,5	2,7	6	3
P40310-M4	M 4	0,7	63	12	21	4,5	3,4	6	3
P40310-M5	M 5	0,8	70	13	25	6	4,9	8	3
P40310-M6	M 6	1	80	15	30	6	4,9	8	3
P40310-M8	M 8	1,25	90	18	35	8	6,2	9	3
P40310-M10	M 10	1,5	100	20	39	10	8	11	3

DIN 376



Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
P40360-M12	M 12	1,75	110	23	83	9	7	10	3
P40360-M14	M 14	2	110	25	81	11	9	12	3
P40360-M16	M 16	2	110	25	68	12	9	12	3
P40360-M20	M 20	2,5	140	30	95	16	12	15	4
P40360-M24	M 24	3	160	36	113	18	14,5	17	4

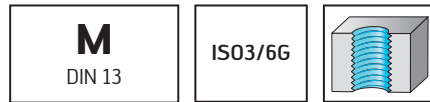


HSS-E machine taps

Prototex® X-pert P



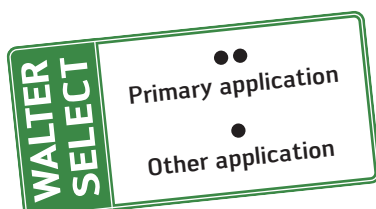
– For long-chipping materials



	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●
Uncoated	●	●	●	●	●	●	●

DIN 371	Designation TIN	Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
		P20330-M2.5	M 2.5	0,45	50	8	12,5	2,8	2,1	5	3
		P20330-M3	M 3	0,5	56	9	18	3,5	2,7	6	3
		P20330-M3.5	M 3.5	0,6	56	11	20	4	3	6	3
		P20330-M4	M 4	0,7	63	12	21	4,5	3,4	6	3
		P20330-M5	M 5	0,8	70	13	25	6	4,9	8	3
	P2033005-M6	P20330-M6	M 6	1	80	15	30	6	4,9	8	3
		P20330-M7	M 7	1	80	15	30	7	5,5	8	3
	P2033005-M8	P20330-M8	M 8	1,25	90	18	35	8	6,2	9	3
	P2033005-M10	P20330-M10	M 10	1,5	100	20	39	10	8	11	3

DIN 376	Designation TIN	Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
		P20380-M5	M 5	0,8	70	13	49	3,5	2,7	6	3
		P20380-M6	M 6	1	80	15	59	4,5	3,4	6	3
		P20380-M8	M 8	1,25	90	18	67	6	4,9	8	3
		P20380-M10	M 10	1,5	100	20	77	7	5,5	8	3
		P20380-M12	M 12	1,75	110	23	83	9	7	10	3
		P20380-M14	M 14	2	110	25	81	11	9	12	3
		P20380-M16	M 16	2	110	25	68	12	9	12	3
		P20380-M18	M 18	2,5	125	30	81	14	11	14	4
		P20380-M20	M 20	2,5	140	30	95	16	12	15	4
		P20380-M24	M 24	3	160	36	113	18	14,5	17	4

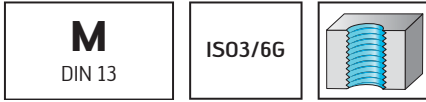
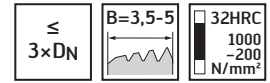


HSS-E machine taps

Prototex® X-pert P

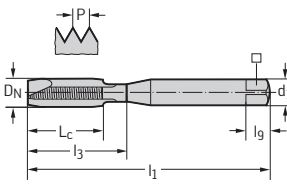


- Reduced number of flutes
- For long-chipping materials



	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●
Uncoated	●	●	●	●	●	●	●

DIN 371



Designation TIN	Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
P2023005-M2	P20230-M2	M 2	0,4	45	6	9	2,8	2,1	5	2
	P20230-M2.3	M 2.3	0,4	45	7	12	2,8	2,1	5	2
P2023005-M2.5	P20230-M2.5	M 2.5	0,45	50	8	12,5	2,8	2,1	5	2
	P20230-M2.6	M 2.6	0,45	50	8	12,5	2,8	2,1	5	2
P2023005-M3	P20230-M3	M 3	0,5	56	9	18	3,5	2,7	6	2
P2023005-M3.5	P20230-M3.5	M 3.5	0,6	56	11	20	4	3	6	2
P2023005-M4	P20230-M4	M 4	0,7	63	12	21	4,5	3,4	6	2
P2023005-M5	P20230-M5	M 5	0,8	70	13	25	6	4,9	8	2

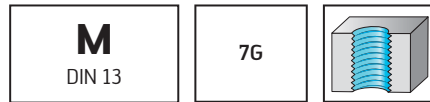
B5

HSS-E machine taps

Prototex® X-pert P



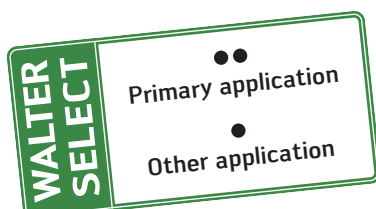
– For long-chipping materials



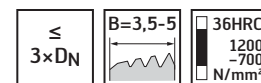
	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●
Uncoated	●	●	●	●	●	●	●

DIN 371	Designation TIN	Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	P2034005-M2	P20340-M2	M 2	0,4	45	6	11	2,8	2,1	5	3
	P2034005-M2.5	P20340-M2.5	M 2.5	0,45	50	8	12,5	2,8	2,1	5	3
		P20340-M2.6	M 2.6	0,45	50	8	14	2,8	2,1	5	3
	P2034005-M3	P20340-M3	M 3	0,5	56	9	18	3,5	2,7	6	3
	P2034005-M3.5	P20340-M3.5	M 3.5	0,6	56	11	20	4	3	6	3
	P2034005-M4	P20340-M4	M 4	0,7	63	12	21	4,5	3,4	6	3
	P2034005-M5	P20340-M5	M 5	0,8	70	13	25	6	4,9	8	3
	P2034005-M6	P20340-M6	M 6	1	80	15	30	6	4,9	8	3
	P2034005-M8	P20340-M8	M 8	1,25	90	18	35	8	6,2	9	3
	P2034005-M10	P20340-M10	M 10	1,5	100	20	39	10	8	11	3

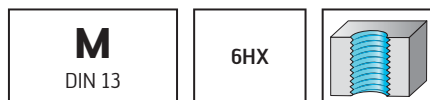
DIN 376	Designation TIN	Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	P2039005-M12	P20390-M12	M 12	1,75	110	23	83	9	7	10	3
	P2039005-M16	P20390-M16	M 16	2	110	25	68	12	9	12	3
	P2039005-M20	P20390-M20	M 20	2,5	140	30	95	16	12	15	4



HSS-E machine taps Prototex® X-pert M

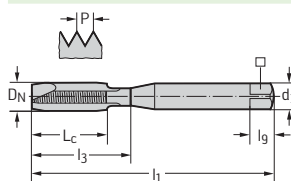


– For long-chipping materials



	P	M	K	N	S	H	O
TICN	●	●●	●	●	●	●	●
TIN	●	●●	●	●	●	●	●
VAP	●	●●	●	●	●	●	●

DIN 371



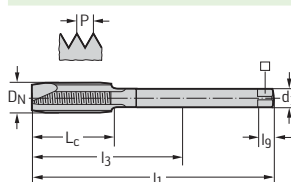
Designation TICN	Designation TIN	Designation VAP	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	N
		M20213-M1	M 1	0,25	40	5	5	2,5	2,1	2
		M20213-M1.2	M 1.2	0,25	40	5	5	2,5	2,1	2
		M20213-M1.4	M 1.4	0,3	40	7	6,5	2,5	2,1	2
		M20213-M1.6	M 1.6	0,35	40	7	7	2,5	2,1	2
		M20213-M1.8	M 1.8	0,35	40	7	7	2,5	2,1	2
		M20213-M1.7	M 1.7	0,35	40	7	7	2,5	2,1	2
M2021306-M2	M2021305-M2	M20213-M2	M 2	0,4	45	6	9	2,8	2,1	2
		M20213-M2.3	M 2.3	0,4	45	7	12	2,8	2,1	2
		M20213-M2.2	M 2.2	0,45	45	7	12	2,8	2,1	2
M2021306-M2.5	M2021305-M2.5	M20213-M2.5	M 2.5	0,45	50	8	12,5	2,8	2,1	2
		M20213-M2.6	M 2.6	0,45	50	8	12,5	2,8	2,1	2
M2021306-M3	M2021305-M3	M20213-M3	M 3	0,5	56	9	18	3,5	2,7	2
M2021306-M3.5	M2021305-M3.5	M20213-M3.5	M 3.5	0,6	56	11	20	4	3	2
M2021306-M4	M2021305-M4	M20213-M4	M 4	0,7	63	12	21	4,5	3,4	3
		M20213-M4.5	M 4.5	0,75	70	13	25	6	4,9	3
M2021306-M5	M2021305-M5	M20213-M5	M 5	0,8	70	13	25	6	4,9	3
M2021306-M6	M2021305-M6	M20213-M6	M 6	1	80	15	30	6	4,9	3
		M20213-M7	M 7	1	80	15	30	7	5,5	3
M2021306-M8	M2021305-M8	M20213-M8	M 8	1,25	90	18	35	8	6,2	3
		M20213-M9	M 9	1,25	90	18	35	9	7	3
M2021306-M10	M2021305-M10	M20213-M10	M 10	1,5	100	20	39	10	8	3

≤ M 1.4: 5HX

≤ M 1.8: Without reduced neck after the thread

l₉ dimension in accordance with DIN 10

DIN 376



Designation TICN	Designation TIN	Designation VAP	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	N
M2026306-M5		M20263-M5	M 5	0,8	70	13	49	3,5	2,7	3
M2026306-M6		M20263-M6	M 6	1	80	15	59	4,5	3,4	3
M2026306-M8		M20263-M8	M 8	1,25	90	18	67	6	4,9	3
M2026306-M10		M20263-M10	M 10	1,5	100	20	77	7	5,5	3
M2026306-M12	M2026305-M12	M20263-M12	M 12	1,75	110	23	83	9	7	4
M2026306-M14	M2026305-M14	M20263-M14	M 14	2	110	25	81	11	9	4
M2026306-M16	M2026305-M16	M20263-M16	M 16	2	110	25	68	12	9	4
		M20263-M18	M 18	2,5	125	30	81	14	11	4
M2026306-M20	M2026305-M20	M20263-M20	M 20	2,5	140	30	95	16	12	4
		M20263-M22	M 22	2,5	140	30	93	18	14,5	4
M2026306-M24		M20263-M24	M 24	3	160	36	113	18	14,5	4
		M20263-M27	M 27	3	160	36	97	20	16	4
		M20263-M30	M 30	3,5	180	42	115	22	18	4
		M20263-M33	M 33	3,5	180	42	113	25	20	5
		M20263-M36	M 36	4	200	48	131	28	22	5

l₉ dimension in accordance with DIN 10



HSS-E machine taps

Prototex® X-pert M

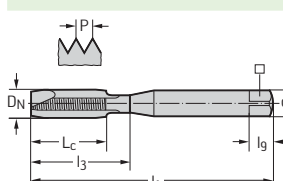


– For long-chipping materials



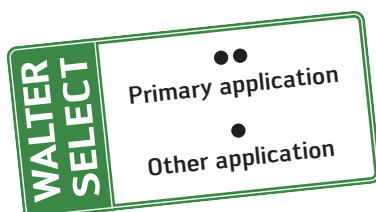
	P	M	K	N	S	H	O
TICN	●	●●	●	●	●	●	●
VAP	●	●●	●	●	●	●	●

DIN 371



Designation TICN	Designation VAP	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	 mm	l_g mm	N
M2023306-M3	M20233-M3	M 3	0,5	56	9	18	3,5	2,7	6	2
M2023306-M4	M20233-M4	M 4	0,7	63	12	21	4,5	3,4	6	3
M2023306-M5	M20233-M5	M 5	0,8	70	13	25	6	4,9	8	3
M2023306-M6	M20233-M6	M 6	1	80	15	30	6	4,9	8	3
M2023306-M7	M20233-M7	M 7	1	80	15	30	7	5,5	8	3
M2023306-M8	M20233-M8	M 8	1,25	90	18	35	8	6,2	9	3
M2023306-M10	M20233-M10	M 10	1,5	100	20	39	10	8	11	3

B5

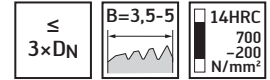


HSS-E machine taps

Prototex® X-pert N



– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated				●●	●		●

DIN 371										
	Designation	DN	P	l ₁	L _c	l ₃	d ₁	□	l _g	N
	Uncoated		mm	mm	mm	mm	h9 mm	mm	mm	
	N20219-M2	M 2	0,4	45	6	9	2,8	2,1	5	2
	N20219-M2.5	M 2.5	0,45	50	8	12,5	2,8	2,1	5	2
	N20219-M3	M 3	0,5	56	9	18	3,5	2,7	6	2
	N20219-M4	M 4	0,7	63	12	21	4,5	3,4	6	2
	N20219-M5	M 5	0,8	70	13	25	6	4,9	8	2
	N20219-M6	M 6	1	80	15	30	6	4,9	8	3
	N20219-M8	M 8	1,25	90	18	35	8	6,2	9	3
	N20219-M10	M 10	1,5	100	20	39	10	8	11	3

B5

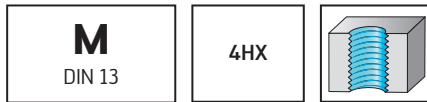


HSS-E-PM machine taps

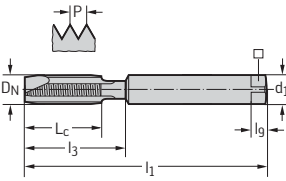
Prototex® TiNi



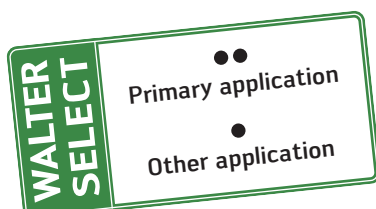
– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●●	●●	●●	●●	●●	●●	●●

~DIN 371										
	Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	202061-M2	M 2	0,4	45	8	8	2,8	2,1	5	2
	202061-M2.5	M 2.5	0,45	50	9	9	2,8	2,1	5	2
	202061-M3	M 3	0,5	56	10	10	3,5	2,7	6	2
	202061-M3.5	M 3.5	0,6	56	12	12	4	3	6	3
	202061-M4	M 4	0,7	63	13	13	4,5	3,4	6	3
	202061-M5	M 5	0,8	70	16	16	6	4,9	8	3
	202061-M6	M 6	1	80	15	23	6	4,9	8	3
	202061-M8	M 8	1,25	90	18	29,5	8	6,2	9	3
	202061-M10	M 10	1,5	100	20	33,5	10	8	11	3

≤ M 5: Without reduced neck after the thread

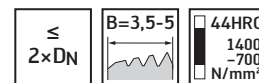
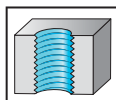


HSS-E-PM machine taps

Prototex® TiNi

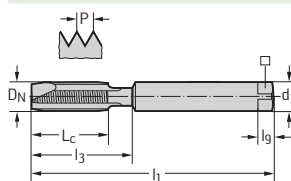


– For long-chipping materials



	P	M	K	N	S	H	O
TICN	●	●	●	●	●	●	●
Uncoated	●	●	●	●	●	●	●

~DIN 371

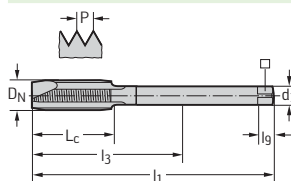


Designation TICN	Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
	202161-M1	M 1	0,25	40	5	5	2,5	2,1	5	2
	202161-M1.2	M 1.2	0,25	40	5	5	2,5	2,1	5	2
	202161-M1.4	M 1.4	0,3	40	5	5	2,5	2,1	5	2
	202161-M1.6	M 1.6	0,35	40	5	5	2,5	2,1	5	2
	202161-M1.8	M 1.8	0,35	40	5	5	2,5	2,1	5	2
2021616-M2	202161-M2	M 2	0,4	45	8	8	2,8	2,1	5	2
	202161-M2.2	M 2.2	0,45	45	8	8	2,8	2,1	5	2
2021616-M2.5	202161-M2.5	M 2.5	0,45	50	9	9	2,8	2,1	5	2
2021616-M3	202161-M3	M 3	0,5	56	10	10	3,5	2,7	6	2
2021616-M3.5	202161-M3.5	M 3.5	0,6	56	12	12	4	3	6	3
2021616-M4	202161-M4	M 4	0,7	63	13	13	4,5	3,4	6	3
	202161-M4.5	M 4.5	0,75	70	13	13	6	4,9	8	3
2021616-M5	202161-M5	M 5	0,8	70	16	16	6	4,9	8	3
2021616-M6	202161-M6	M 6	1	80	15	23	6	4,9	8	3
2021616-M8	202161-M8	M 8	1,25	90	18	29,5	8	6,2	9	3
2021616-M10	202161-M10	M 10	1,5	100	20	33,5	10	8	11	3

≤ M 1.4: 5HX

≤ M 5: Without reduced neck after the thread

DIN 376



Designation TICN	Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
2026616-M12	202661-M12	M 12	1,75	110	23	83	9	7	10	4
2026616-M14	202661-M14	M 14	2	110	25	81	11	9	12	4
2026616-M16	202661-M16	M 16	2	110	25	68	12	9	12	4
2026616-M20	202661-M20	M 20	2,5	140	30	95	16	12	15	4
2026616-M24	202661-M24	M 24	3	160	36	113	18	14,5	17	4

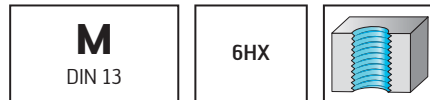
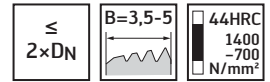


HSS-E-PM machine taps

Prototex® TiNi Plus



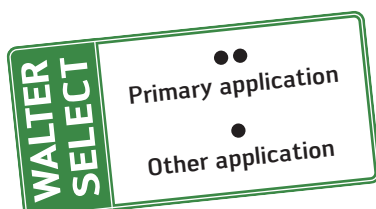
- Machining with emulsion is possible
- For long-chipping materials



	P	M	K	N	S	H	O
ACN					••		

~DIN 371		Designation ACN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	2021763-M2	M 2		0,4	45	8	8	2,8	2,1	5	2
	2021763-M2.5	M 2.5		0,45	50	9	9	2,8	2,1	5	2
	2021763-M3	M 3		0,5	56	10	10	3,5	2,7	6	2
	2021763-M3.5	M 3.5		0,6	56	12	12	4	3	6	3
	2021763-M4	M 4		0,7	63	13	13	4,5	3,4	6	3
	2021763-M5	M 5		0,8	70	16	16	6	4,9	8	3
	2021763-M6	M 6		1	80	15	23	6	4,9	8	3
	2021763-M8	M 8		1,25	90	18	29,5	8	6,2	9	3
	2021763-M10	M 10		1,5	100	20	33,5	10	8	11	3

DIN 376		Designation ACN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	2026763-M12	M 12		1,75	110	23	83	9	7	10	4
	2026763-M16	M 16		2	110	25	68	12	9	12	4
	2026763-M20	M 20		2,5	140	30	95	16	12	15	4

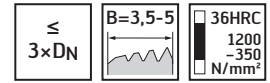


HSS-E-PM machine taps

Prototex® Sprint

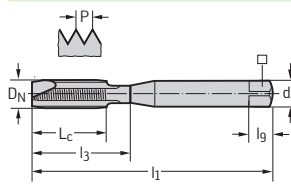


– For long-chipping materials



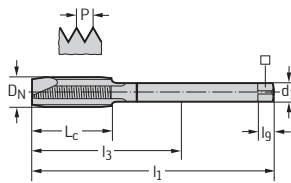
	P	M	K	N	S	H	O
TICN	●	●	●	●	●	●	●
TIN	●	●	●	●	●	●	●

DIN 371



Designation TICN	Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
7021366-M3	7021365-M3	M 3	0,5	56	9	18	3,5	2,7	6	3
7021366-M4	7021365-M4	M 4	0,7	63	12	21	4,5	3,4	6	3
7021366-M5	7021365-M5	M 5	0,8	70	13	25	6	4,9	8	3
7021366-M6	7021365-M6	M 6	1	80	15	30	6	4,9	8	3
7021366-M8	7021365-M8	M 8	1,25	90	18	35	8	6,2	9	3
7021366-M10	7021365-M10	M 10	1,5	100	20	39	10	8	11	3

DIN 376



Designation TICN	Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	7026365-M12	M 12	1,75	110	23	83	9	7	10	3
	7026365-M14	M 14	2	110	25	81	11	9	12	3
	7026365-M16	M 16	2	110	25	68	12	9	12	3
	7026365-M18	M 18	2,5	125	30	81	14	11	14	3
	7026365-M20	M 20	2,5	140	30	95	16	12	15	3

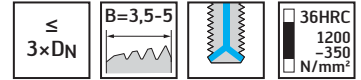


HSS-E-PM machine taps

Prototex® Megasprint

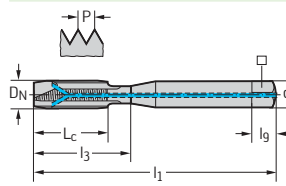


– For long-chipping materials



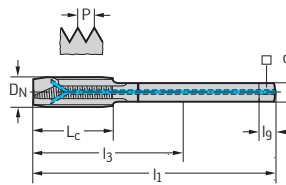
	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●

DIN 371

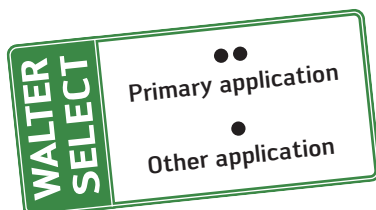


Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
7021345-M6	M 6	1	80	15	30	6	4,9	8	3
7021345-M8	M 8	1,25	90	18	35	8	6,2	9	3
7021345-M10	M 10	1,5	100	20	39	10	8	11	3

DIN 376



Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
7026345-M12	M 12	1,75	110	23	83	9	7	10	3
7026345-M16	M 16	2	110	25	68	12	9	12	3
7026345-M20	M 20	2,5	140	30	95	16	12	15	3

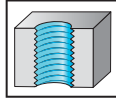
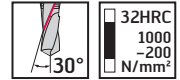


HSS-E machine drill taps

Paradur® Combi

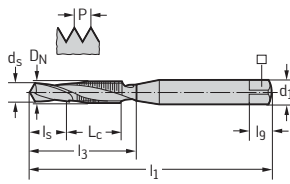


– For long-chipping materials



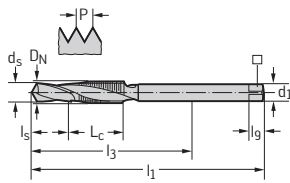
	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

~DIN 371



Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	d _s mm	l _s mm	l ₃ mm	d ₁ h12 mm	mm	l _g mm	N
20417-M3	M 3	0,5	63	11	2,5	10	21	3	2,7	6	2
20417-M4	M 4	0,7	75	14	3,3	11	25	4	3,4	6	2
20417-M5	M 5	0,8	80	16	4,2	12	28	5	4,9	8	2
20417-M6	M 6	1	85	18	5	13	32	6	4,9	8	2

~DIN 376



Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	d _s mm	l _s mm	l ₃ mm	d ₁ h12 mm	mm	l _g mm	N
20467-M8	M 8	1,25	90	14	6,7	18	67	8	4,9	8	2
20467-M10	M 10	1,5	100	17	8,5	24	77	10	5,5	8	4
20467-M12	M 12	1,75	125	20	10,2	25	98	12	7	10	4

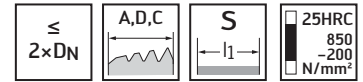
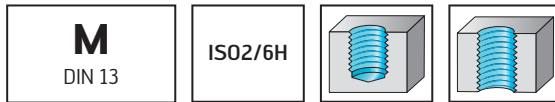


HSS hand tap set

HGB

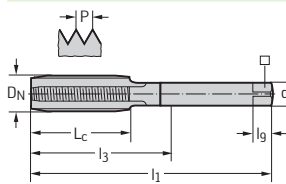


– For long and short-chipping materials



	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

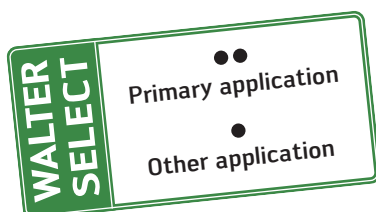
DIN 352



Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
30060-M2	M 2	0,4	36	8	8	2,8	2,1	5	3
30060-M2.5	M 2.5	0,45	40	9	9	2,8	2,1	5	3
30060-M3	M 3	0,5	40	9	13,5	3,5	2,7	6	3
30060-M4	M 4	0,7	45	11	16,5	4,5	3,4	6	3
30060-M5	M 5	0,8	50	13	19	6	4,9	8	3
30060-M6	M 6	1	56	15	27	6	4,9	8	3
30060-M8	M 8	1,25	63	19	40	6	4,9	8	3
30060-M10	M 10	1,5	70	22	47	7	5,5	8	3
30060-M12	M 12	1,75	75	25	48	9	7	10	4
30060-M16	M 16	2	80	25	38	12	9	12	4
30060-M20	M 20	2,5	95	32	50	16	12	15	4
30060-M24	M 24	3	110	34	63	18	14,5	17	4
30060-M30	M 30	3,5	125	40	60	22	18	21	4

Ordering code includes initial, intermediate and final cutter.
 ≤ M 2.5: Without reduced neck after the thread

B5

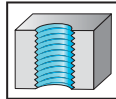
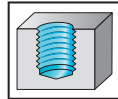


HSS-E hand tap set

HGB Inox

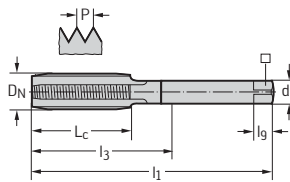


– For long-chipping materials



	P	M	K	N	S	H	O
VAP	●	●	●	●	●	●	●

DIN 352



Designation VAP	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
30063-M2	M 2	0,4	36	8	7	2,8	2,1	5	3
30063-M2.5	M 2.5	0,45	40	9	7,9	2,8	2,1	5	3
30063-M3	M 3	0,5	40	9	7,8	3,5	2,7	6	3
30063-M4	M 4	0,7	45	11	9,3	4,5	3,4	6	3
30063-M5	M 5	0,8	50	13	11	6	4,9	8	3
30063-M6	M 6	1	56	15	12,5	6	4,9	8	3
30063-M8	M 8	1,25	63	19	15,9	6	4,9	8	3
30063-M10	M 10	1,5	70	22	18,3	7	5,5	8	4
30063-M12	M 12	1,75	75	25	20,6	9	7	10	4
30063-M16	M 16	2	80	25	20	12	9	12	4
30063-M20	M 20	2,5	95	32	25,8	16	12	15	4
30063-M24	M 24	3	110	34	26,5	18	14,5	17	4
30063-M30	M 30	3,5	125	40	31,3	22	18	21	4

Ordering code includes initial, intermediate and final cutter.
≤ M 2.5: Without reduced neck after the thread

B5

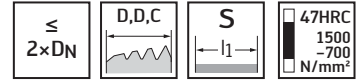


HSS-E hand tap set

HGB Ti

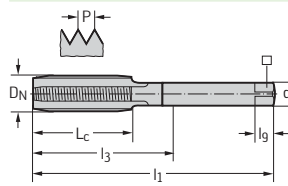


– For long-chipping materials



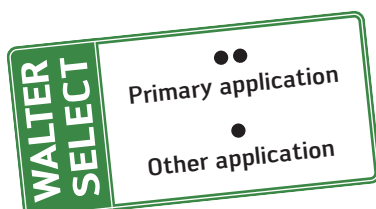
	P	M	K	N	S	H	O
NID					●		

DIN 352



Designation NID	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	l_9 mm	N
30016-M3	M 3	0,5	40	9	7,8	3,5	2,7	3
30016-M4	M 4	0,7	45	11	9,3	4,5	3,4	3
30016-M5	M 5	0,8	50	13	11	6	4,9	3
30016-M6	M 6	1	56	15	12,5	6	4,9	3
30016-M8	M 8	1,25	63	19	15,9	6	4,9	4
30016-M10	M 10	1,5	70	22	18,3	7	5,5	4
30016-M12	M 12	1,75	75	25	20,6	9	7	4

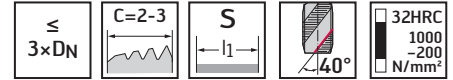
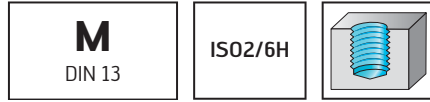
Ordering code includes initial, intermediate and final cutter.



HSS-E taps, short KMB WST

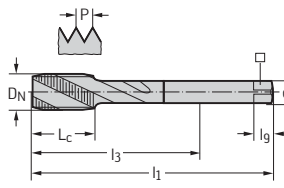


– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

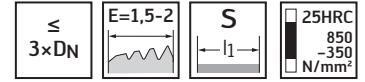
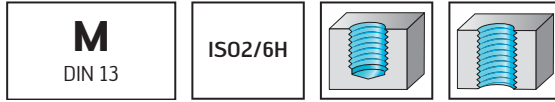
DIN 2184-2										
Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N	
20167-M3	M 3	0,5	40	6	13,5	3,5	2,7	6	3	
20167-M4	M 4	0,7	45	7	16,5	4,5	3,4	6	3	
20167-M5	M 5	0,8	50	8	19	6	4,9	8	3	
20167-M6	M 6	1	56	10	27	6	4,9	8	3	
20167-M8	M 8	1,25	63	12	40	6	4,9	8	3	
20167-M10	M 10	1,5	70	15	47	7	5,5	8	3	
20167-M12	M 12	1,75	75	16	48	9	7	10	3	



HSS-E taps, short KMB Ms

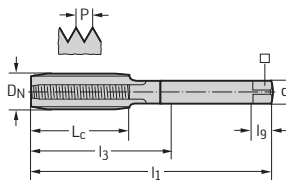


– For short-chipping materials



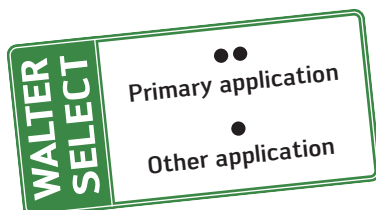
	P	M	K	N	S	H	O
Uncoated				●●			●

DIN 2184-2



Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	h9 mm	 mm	l _g mm	N
20165-M2	M 2	0,4	36	8	8	2,8	2,1	5	3
20165-M2.5	M 2.5	0,45	40	9	9	2,8	2,1	5	3
20165-M3	M 3	0,5	40	9	13,5	3,5	2,7	6	3
20165-M3.5	M 3.5	0,6	45	10	15	4	3	6	3
20165-M4	M 4	0,7	45	11	16,5	4,5	3,4	6	3
20165-M5	M 5	0,8	50	13	19	6	4,9	8	3
20165-M6	M 6	1	56	15	27	6	4,9	8	3
20165-M8	M 8	1,25	63	19	40	6	4,9	8	3

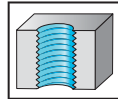
≤ M 2.5: Without reduced neck after the thread



HSS-E taps, short KMB H

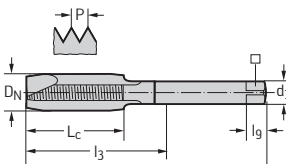


– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

DIN 2184-2



Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
20160-M3	M 3	0,5	40	9	13,5	3,5	2,7	6	3
20160-M4	M 4	0,7	45	11	16,5	4,5	3,4	6	3
20160-M5	M 5	0,8	50	13	19	6	4,9	8	3
20160-M6	M 6	1	56	15	27	6	4,9	8	3
20160-M8	M 8	1,25	63	19	40	6	4,9	8	3
20160-M10	M 10	1,5	70	22	47	7	5,5	8	3
20160-M12	M 12	1,75	75	25	48	9	7	10	3

B5



HSS-E nut taps

MMB



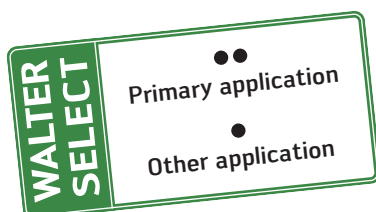
– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●●						

DIN 357		Designation	D_N	P	l_1	L_c	l_3	d_1	l_9	N
		Uncoated		mm	mm	mm	mm	h12 mm	mm	
	20890-M2	M 2	0,4	66	16	47	1,4	1,1	4	3
	20890-M2.5	M 2.5	0,45	70	20	51	1,7	1,3	4	3
	20890-M3	M 3	0,5	70	22	51	2,2	1,8	4	3
	20890-M4	M 4	0,7	90	25	70	2,8	2,1	5	3
	20890-M5	M 5	0,8	100	28	79	3,5	2,7	6	3
	20890-M6	M 6	1	110	32	89	4,5	3,4	6	3
	20890-M8	M 8	1,25	125	40	102	6	4,9	8	3
	20890-M10	M 10	1,5	140	45	117	7	5,5	8	3
	20890-M12	M 12	1,75	180	50	153	9	7	10	3
	20890-M16	M 16	2	200	63	158	12	9	12	3

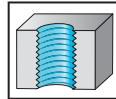
B5



HSS-E automatic nut thread taps AMB



– For long-chipping materials



	P	M	K	N	S	H	O
NID	●●						

AMB STANDARD							
	Designation NID	D _N	P mm	l ₁ mm	L _c mm	d ₁ h12 mm	N
	20801-M3	M 3	0,5	250	12	2,3	3
	20801-M3.5	M 3.5	0,6	250	14,5	2,7	3
	20801-M4	M 4	0,7	250	17	3	3
	20801-M5	M 5	0,8	250	19	3,9	3
	20801-M6	M 6	1	250	24	4,6	3
	20801-M8	M 8	1,25	250	30	6,1	3

3 AN leveller

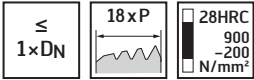
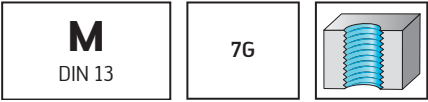
B5



HSS-E automatic nut thread taps AMB

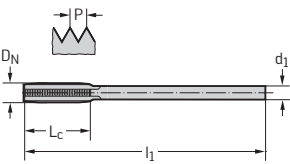


– For long-chipping materials



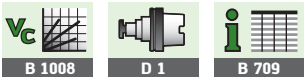
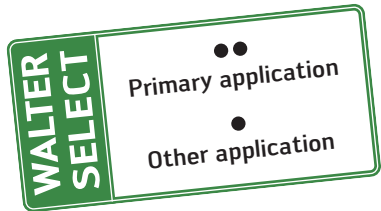
	P	M	K	N	S	H	O
TIN	●●						

AMB STANDARD



Designation TIN	DN	P mm	l1 mm	Lc mm	d1 h12 mm	N
2084805-M5	M 5	0,8	271	19	3,9	5
2084805-M6	M 6	1	271	24	4,6	5
2084805-M8	M 8	1,25	271	30	6,1	5
2084805-M10	M 10	1,5	271	36	8	5

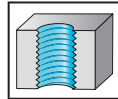
MAS 14, T-STAR 10



HSS-E automatic nut thread taps AMB Inox



– For long-chipping materials

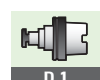


	P	M	K	N	S	H	O
NID		●●					

AMB STANDARD							
	Designation NID	D _N	P mm	l ₁ mm	L _c mm	d ₁ h12 mm	N
	20844-M6	M 6	1	271	24	4,6	5
	20844-M8	M 8	1,25	271	30	6,1	5
	20844-M10	M 10	1,5	271	36	8	5
	20844-M12	M 12	1,75	271	42	9,4	5

MAS 14, T-STAR 10

B5

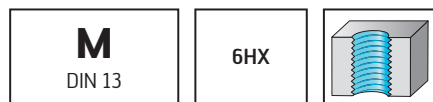


HSS-E stepped AMB Protostep Inox



- For long-chipping materials
- Three steps

33HRC
1100
~400
N/mm²



	P	M	K	N	S	H	O
VAP		●●					

AMB STANDARD

	Designation VAP	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h12 mm	N
	20934-M3	M 3	0,5	195	12	9,8	2,3	3
	20934-M4	M 4	0,7	195	17	13,9	3	3

MAS 8

AMB STANDARD

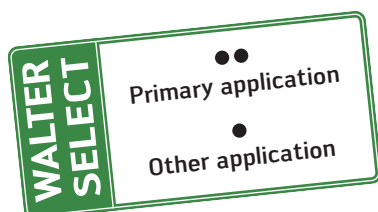
	Designation VAP	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h12 mm	N
	20944-M5	M 5	0,8	271	19	15,4	3,9	3
	20944-M6	M 6	1	271	24	19,5	4,6	3
	20944-M8	M 8	1,25	271	30	24,4	6,1	3
	20944-M10	M 10	1,5	271	36	29,3	8	3
	20944-M12	M 12	1,75	271	42	34,1	9,4	4

MAS 14, T-STAR 10

AMB STANDARD

	Designation VAP	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h12 mm	N
	20954-M14	M 14	2	435	48	39	11,1	4
	20954-M16	M 16	2	435	48	39	13,2	4

MAS 20, T-STAR 20

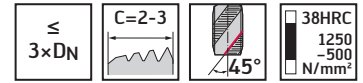


HSS-E-PM machine taps

Paradur® Eco Plus



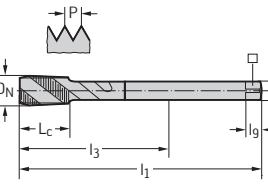
– For long-chipping materials



	P	M	K	N	S	H	O
THL	●	●	●	●	●	●	●
TIN	●	●	●	●	●	●	●

~DIN 371		Designation THL	Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
	EP2051302-M2	EP2051305-M2	M 2	0,4	45	4	7,6	2,8	2,1	5	3	
	EP2051302-M2.5	EP2051305-M2.5	M 2.5	0,45	50	4	9,3	2,8	2,1	5	3	
	EP2051302-M3	EP2051305-M3	M 3	0,5	56	6	11	3,5	2,7	6	3	
	EP2051302-M4	EP2051305-M4	M 4	0,7	63	7	14,8	4,5	3,4	6	3	
	EP2051302-M5	EP2051305-M5	M 5	0,8	70	8	20,7	6	4,9	8	3	
	EP2051302-M6	EP2051305-M6	M 6	1	80	10	25	6	4,9	8	3	
	EP2051302-M8	EP2051305-M8	M 8	1,25	90	12	35	8	6,2	9	3	
	EP2051302-M10	EP2051305-M10	M 10	1,5	100	15	39	10	8	11	3	

DIN 376



Designation THL	Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	 mm	l ₉ mm	N
EP2056302-M12	EP2056305-M12	M 12	1,75	110	16	83	9	7	10	4
EP2056302-M14	EP2056305-M14	M 14	2	110	20	81	11	9	12	4
EP2056302-M16	EP2056305-M16	M 16	2	110	20	68	12	9	12	4
EP2056302-M18	EP2056305-M18	M 18	2,5	125	25	81	14	11	14	4
EP2056302-M20	EP2056305-M20	M 20	2,5	140	25	95	16	12	15	4
EP2056302-M24	EP2056305-M24	M 24	3	160	30	113	18	14,5	17	4
EP2056302-M27		M 27	3	160	30	97	20	16	19	4
EP2056302-M30		M 30	3,5	180	35	115	22	18	21	4
EP2056302-M36		M 36	4	200	40	131	28	22	25	4
EP2056302-M42		M 42	4,5	200	45	102	32	24	27	5
EP2056302-M48		M 48	5	250	50	147	36	29	32	5
EP2056302-M56		M 56	5,5	250	55	120	40	32	35	5
EP2056302-M64		M 64	6	315	60	178	50	39	42	6

HSS-E-PM machine taps

Paradur® Eco Plus



– For long-chipping materials

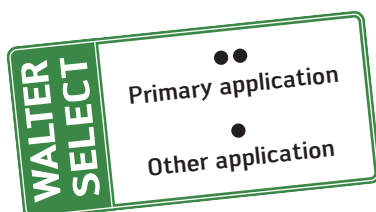


	P	M	K	N	S	H	O
THL	●	●	●	●			

~DIN 371		Designation THL	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	$\square$ mm	l_9 mm	N
	EP2051312-M4	M 4		0,7	63	7	14,8	4,5	3,4	6	3
	EP2051312-M5	M 5		0,8	70	8	20,7	6	4,9	8	3
	EP2051312-M6	M 6		1	80	10	25	6	4,9	8	3
	EP2051312-M8	M 8		1,25	90	12	35	8	6,2	9	3
	EP2051312-M10	M 10		1,5	100	15	39	10	8	11	3

DIN 376		Designation THL	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	$\square$ mm	l_9 mm	N
	EP2056312-M12	M 12		1,75	110	16	83	9	7	10	4
	EP2056312-M16	M 16		2	110	20	68	12	9	12	4
	EP2056312-M20	M 20		2,5	140	25	95	16	12	15	4
	EP2056312-M24	M 24		3	160	30	113	18	14,5	17	4

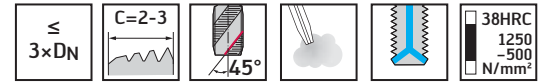
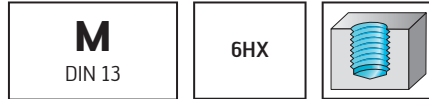
B5



HSS-E-PM machine taps Paradur® Eco Plus

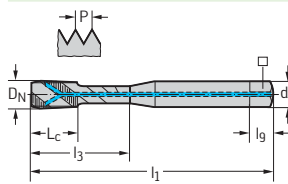


– For long-chipping materials



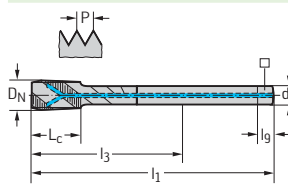
	P	M	K	N	S	H	O
THL	●	●	●	●			

DIN 371



Designation THL	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
EP2051342-M8	M 8	1,25	90	12	35	8	6,2	9	3
EP2051342-M10	M 10	1,5	100	15	39	10	8	11	3

DIN 376



Designation THL	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
EP2056342-M12	M 12	1,75	110	16	83	9	7	10	4
EP2056342-M16	M 16	2	110	20	68	12	9	12	4

HSS-E-PM machine taps

Paradur® Eco Plus



– For long-chipping materials

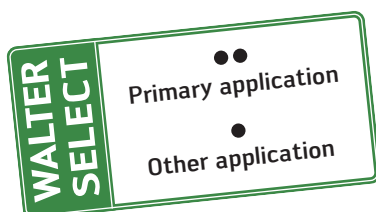


	P	M	K	N	S	H	O
THL	●	●	●	●			

~DIN 371		Designation THL	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	EP2051382-M3	M 3 - LH		0,5	56	6	11	3,5	2,7	6	3
	EP2051382-M4	M 4 - LH		0,7	63	7	14,8	4,5	3,4	6	3
	EP2051382-M5	M 5 - LH		0,8	70	8	20,7	6	4,9	8	3
	EP2051382-M6	M 6 - LH		1	80	10	25	6	4,9	8	3
	EP2051382-M8	M 8 - LH		1,25	90	12	35	8	6,2	9	3
	EP2051382-M10	M 10 - LH		1,5	100	15	39	10	8	11	3

DIN 376		Designation THL	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	EP2056382-M12	M 12 - LH		1,75	110	16	83	9	7	10	4
	EP2056382-M14	M 14 - LH		2	110	20	81	11	9	12	4
	EP2056382-M16	M 16 - LH		2	110	20	68	12	9	12	4
	EP2056382-M18	M 18 - LH		2,5	125	25	81	14	11	14	4
	EP2056382-M20	M 20 - LH		2,5	140	25	95	16	12	15	4

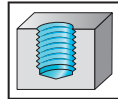
B5



HSS-E-PM machine taps Paradur® Eco Plus

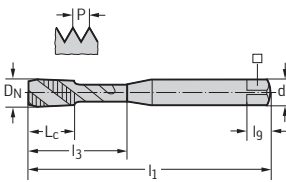


– For long-chipping materials



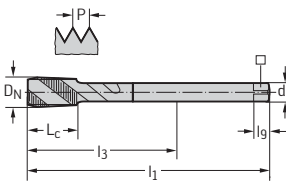
	P	M	K	N	S	H	O
THL	●	●	●	●			

~DIN 371



Designation THL	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
EP2051362-M4	M 4	0,7	63	7	14,8	4,5	3,4	6	3
EP2051362-M5	M 5	0,8	70	8	20,7	6	4,9	8	3
EP2051362-M6	M 6	1	80	10	25	6	4,9	8	3
EP2051362-M8	M 8	1,25	90	12	35	8	6,2	9	4
EP2051362-M10	M 10	1,5	100	15	39	10	8	11	4

DIN 376



Designation THL	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
EP2056362-M12	M 12	1,75	110	16	83	9	7	10	4
EP2056362-M16	M 16	2	110	20	68	12	9	12	4
EP2056362-M20	M 20	2,5	140	25	95	16	12	15	4
EP2056362-M24	M 24	3	160	30	113	18	14,5	17	5



HSS-E-PM machine taps

Paradur® Eco Plus

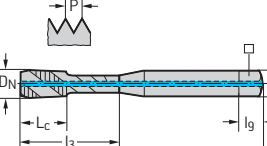


– For long-chipping materials



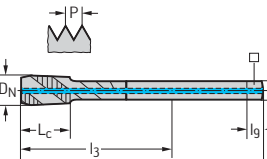
	P	M	K	N	S	H	O
THL	●	●	●	●			

~DIN 371



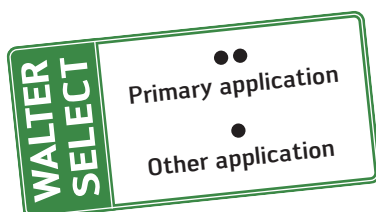
Designation THL	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
EP2051352-M4	M 4	0,7	63	7	14,8	4,5	3,4	6	3
EP2051352-M5	M 5	0,8	70	8	20,7	6	4,9	8	3
EP2051352-M6	M 6	1	80	10	25	6	4,9	8	3
EP2051352-M8	M 8	1,25	90	12	35	8	6,2	9	4
EP2051352-M10	M 10	1,5	100	15	39	10	8	11	4

DIN 376



Designation THL	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	 mm	l _g mm	N
EP2056352-M12	M 12	1,75	110	16	83	9	7	10	4
EP2056352-M16	M 16	2	110	20	68	12	9	12	4
EP2056352-M20	M 20	2,5	140	25	95	16	12	15	4

B 5

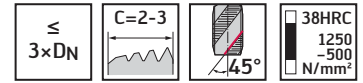
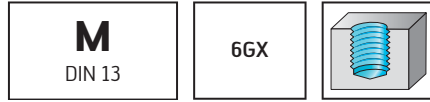


HSS-E-PM machine taps

Paradur® Eco Plus



– For long-chipping materials



	P	M	K	N	S	H	O
THL	●	●	●	●	●	●	●
TIN	●	●	●	●	●	●	●

~DIN 371	Designation THL	Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	EP2053302-M2	EP2053305-M2	M 2	0,4	45	4	7,6	2,8	2,1	5	3
	EP2053302-M2.5	EP2053305-M2.5	M 2.5	0,45	50	4	9,3	2,8	2,1	5	3
	EP2053302-M3	EP2053305-M3	M 3	0,5	56	6	11	3,5	2,7	6	3
	EP2053302-M4	EP2053305-M4	M 4	0,7	63	7	14,8	4,5	3,4	6	3
	EP2053302-M5	EP2053305-M5	M 5	0,8	70	8	20,7	6	4,9	8	3
	EP2053302-M6	EP2053305-M6	M 6	1	80	10	25	6	4,9	8	3
	EP2053302-M8	EP2053305-M8	M 8	1,25	90	12	35	8	6,2	9	3
	EP2053302-M10	EP2053305-M10	M 10	1,5	100	15	39	10	8	11	3

≤ M 2.5: Without thread taper

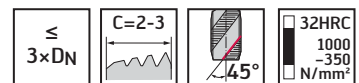
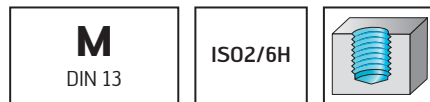
DIN 376	Designation THL	Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	EP2058302-M12	EP2058305-M12	M 12	1,75	110	16	83	9	7	10	4
	EP2058302-M14	EP2058305-M14	M 14	2	110	20	81	11	9	12	4
	EP2058302-M16	EP2058305-M16	M 16	2	110	20	68	12	9	12	4

HSS-E machine taps

TC115 Perform



– For long-chipping materials



	P	M	K	N	S	H	O
WY80AA	●	●	●	●			
WY80FC	●	●	●	●			

DIN 371

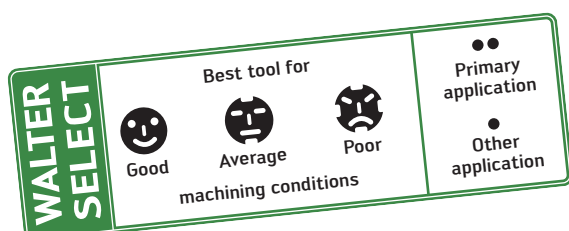
Designation	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N	WY80AA	WY80FC
TC115-M3-C0-	M 3	0,5	56	6	18	3,5	2,7	6	3	●	●
TC115-M4-C0-	M 4	0,7	63	7	21	4,5	3,4	6	3	●	●
TC115-M5-C0-	M 5	0,8	70	8	25	6	4,9	8	3	●	●
TC115-M6-C0-	M 6	1	80	10	30	6	4,9	8	3	●	●
TC115-M8-C0-	M 8	1,25	90	12	35	8	6,2	9	3	●	●
TC115-M10-C0-	M 10	1,5	100	15	39	10	8	11	3	●	●

Ordering example for the WY80FC grade: TC115-M3-C0-WY80FC

DIN 376

Designation	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N	WY80AA	WY80FC
TC115-M12-L0-	M 12	1,75	110	16	83	9	7	10	3	●	●
TC115-M14-L0-	M 14	2	110	20	81	11	9	12	3	●	●
TC115-M16-L0-	M 16	2	110	20	68	12	9	12	3	●	●
TC115-M20-L0-	M 20	2,5	140	25	95	16	12	15	4	●	●

Ordering example for the WY80FC grade: TC115-M12-L0-WY80FC

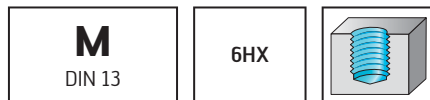
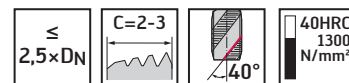


HSS-E machine taps

Paradur® Synchrospeed



- For long-chipping materials
- Only for synchronous machining (rigid tapping)



	P	M	K	N	S	H	O
THL	●	●	●	●	●	●	●
TIN/VAP	●	●	●	●	●	●	●

~DIN 371	Designation THL	Designation TIN/VAP	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	□ mm	l ₉ mm	N
	S2051302-M2	S2051305-M2	M 2	0,4	70	4	7,6	6	4,9	8	3
	S2051302-M2.5	S2051305-M2.5	M 2.5	0,45	70	4,5	9,3	6	4,9	8	3
	S2051302-M3	S2051305-M3	M 3	0,5	70	5	11	6	4,9	8	3
	S2051302-M4	S2051305-M4	M 4	0,7	70	7	14,8	6	4,9	8	3
	S2051302-M5	S2051305-M5	M 5	0,8	70	8,5	20,7	6	4,9	8	3
	S2051302-M6	S2051305-M6	M 6	1	80	10,5	25	6	4,9	8	3
	S2051302-M8	S2051305-M8	M 8	1,25	90	13,5	35	8	6,2	9	3
	S2051302-M10	S2051305-M10	M 10	1,5	100	16	39	10	8	11	3

~DIN 376	Designation THL	Designation TIN/VAP	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	□ mm	l ₉ mm	N
	S2056302-M12	S2056305-M12	M 12	1,75	110	18,5	42	12	9	12	3
	S2056302-M14	S2056305-M14	M 14	2	110	21	45	14	11	14	3
	S2056302-M16	S2056305-M16	M 16	2	110	21	55	16	12	15	4
	S2056302-M20	S2056305-M20	M 20	2,5	140	26,5	95	16	12	15	4
	S2056302-M24	S2056305-M24	M 24	3	160	32	97	20	16	19	4

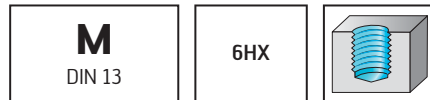


HSS-E machine taps

Paradur® Synchrospeed



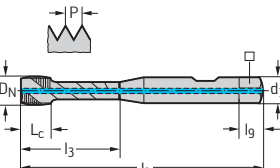
- For long-chipping materials
- Only for synchronous machining (rigid tapping)



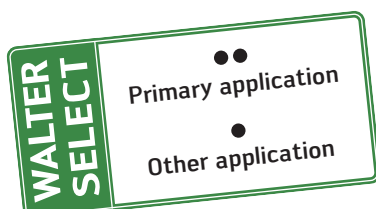
	P	M	K	N	S	H	O
THL	●	●	●	●	●	●	●
TIN/VAP	●	●	●	●	●	●	●

~DIN 371

Designation THL	Designation TIN/VAP	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	mm	l _g mm	N
S2051312-M5	S2051315-M5	M 5	0,8	70	8,5	20,7	6	4,9	8	3
S2051312-M6	S2051315-M6	M 6	1	80	10,5	25	6	4,9	8	3
S2051312-M8	S2051315-M8	M 8	1,25	90	13,5	35	8	6,2	9	3
S2051312-M10	S2051315-M10	M 10	1,5	100	16	39	10	8	11	3

~DIN 376												
	Designation THL	Designation TIN/VAP	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	 mm	l _g mm	N	
	S2056312-M12	S2056315-M12	M 12	1,75	110	18,5	68	12	9	12	3	
	S2056312-M14	S2056315-M14	M 14	2	110	21	66	14	11	14	3	
	S2056312-M16	S2056315-M16	M 16	2	110	21	65	16	12	15	4	
	S2056312-M20	S2056315-M20	M 20	2,5	140	26,5	95	16	12	15	4	

B5

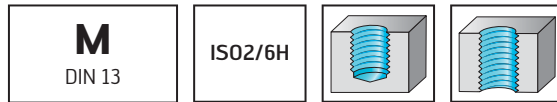
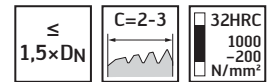


HSS-E machine taps

Paradur® H

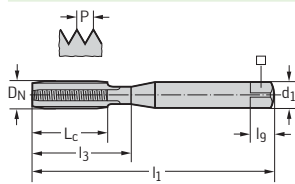


– For long-chipping and short-chipping materials



	P	M	K	N	S	H	O
TIN			●	●●			●
Uncoated			●	●●			●

DIN 371

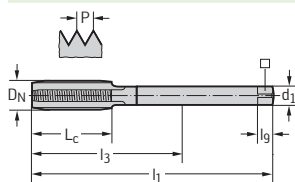


Designation TIN	Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	20311-M1	M 1	0,25	40	5	5	2,5	2,1	5	3
	20311-M1.2	M 1.2	0,25	40	5	5	2,5	2,1	5	3
	20311-M1.4	M 1.4	0,3	40	6,5	6,5	2,5	2,1	5	3
	20311-M1.6	M 1.6	0,35	40	7	7	2,5	2,1	5	3
	20311-M1.7	M 1.7	0,35	40	7	7	2,5	2,1	5	3
	20311-M1.8	M 1.8	0,35	40	7	7	2,5	2,1	5	3
	20311-M2	M 2	0,4	45	6	9	2,8	2,1	5	3
	20311-M2.2	M 2.2	0,45	45	7	12	2,8	2,1	5	3
	20311-M2.3	M 2.3	0,4	45	7	12	2,8	2,1	5	3
	20311-M2.5	M 2.5	0,45	50	8	12,5	2,8	2,1	5	3
	20311-M2.6	M 2.6	0,45	50	8	12,5	2,8	2,1	5	3
203115-M3	20311-M3	M 3	0,5	56	9	18	3,5	2,7	6	3
203115-M3.5	20311-M3.5	M 3.5	0,6	56	11	20	4	3	6	3
203115-M4	20311-M4	M 4	0,7	63	12	21	4,5	3,4	6	3
203115-M5	20311-M5	M 5	0,8	70	13	25	6	4,9	8	3
203115-M6	20311-M6	M 6	1	80	15	30	6	4,9	8	3
203115-M7	20311-M7	M 7	1	80	15	30	7	5,5	8	3
203115-M8	20311-M8	M 8	1,25	90	18	35	8	6,2	9	3
203115-M10	20311-M10	M 10	1,5	100	20	39	10	8	11	3

≤ M 1.4: 5H

≤ M 1.8: Without reduced neck after the thread

DIN 376



Designation TIN	Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	20361-M2	M 2	0,4	45	6	26	1,4	1,1	4	3
	20361-M2.5	M 2.5	0,45	50	8	31	1,8	1,4	4	3
	20361-M3	M 3	0,5	56	9	37	2,2	1,8	4	3
	20361-M4	M 4	0,7	63	12	43	2,8	2,1	5	3
	20361-M5	M 5	0,8	70	13	49	3,5	2,7	6	3
	20361-M6	M 6	1	80	15	59	4,5	3,4	6	3
	20361-M8	M 8	1,25	90	18	67	6	4,9	8	3
	20361-M10	M 10	1,5	100	20	77	7	5,5	8	3
	20361-M12	M 12	1,75	110	23	83	9	7	10	3
	20361-M14	M 14	2	110	25	81	11	9	12	3
	20361-M16	M 16	2	110	25	68	12	9	12	3
	20361-M18	M 18	2,5	125	30	81	14	11	14	4
	20361-M20	M 20	2,5	140	30	95	16	12	15	4
	20361-M24	M 24	3	160	36	113	18	14,5	17	4
	20361-M27	M 27	3	160	36	97	20	16	19	4
	20361-M30	M 30	3,5	180	42	115	22	18	21	4
	20361-M33	M 33	3,5	180	42	113	25	20	23	4
	20361-M36	M 36	4	200	48	131	28	22	25	4
	20361-M42	M 42	4,5	200	54	102	32	24	27	4

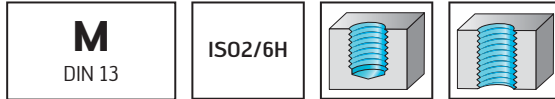
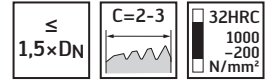


HSS-E machine taps

Paradur® H AZ



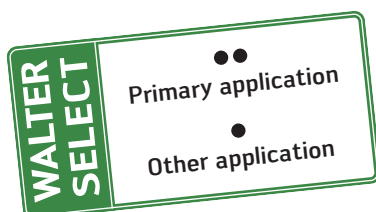
- For long-chipping and short-chipping materials
- For thin-walled workpieces



	P	M	K	N	S	H	O
Uncoated			●●	●●			●

DIN 371										
	Designation Uncoated	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	$\square$ mm	l_g mm	N
	40311-M3	M 3	0,5	56	9	18	3,5	2,7	6	3
	40311-M4	M 4	0,7	63	12	21	4,5	3,4	6	3
	40311-M5	M 5	0,8	70	13	25	6	4,9	8	3
	40311-M6	M 6	1	80	15	30	6	4,9	8	3
	40311-M8	M 8	1,25	90	18	35	8	6,2	9	3
	40311-M10	M 10	1,5	100	20	39	10	8	11	3

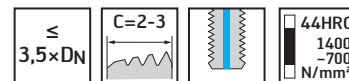
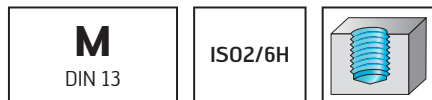
B5



HSS-E machine taps Paradur® HT

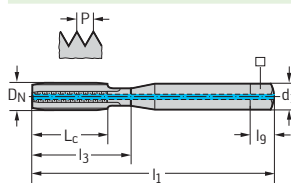


– For long-chipping and short-chipping materials



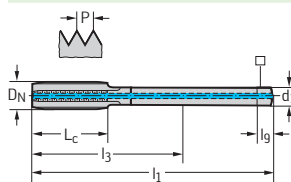
	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●

DIN 371



Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
2031115-M4	M 4	0,7	63	12	21	4,5	3,4	6	3
2031115-M5	M 5	0,8	70	13	25	6	4,9	8	3
2031115-M6	M 6	1	80	15	30	6	4,9	8	3
2031115-M8	M 8	1,25	90	18	35	8	6,2	9	3
2031115-M10	M 10	1,5	100	20	39	10	8	11	3

DIN 376



Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
2036115-M12	M 12	1,75	110	23	83	9	7	10	3
2036115-M14	M 14	2	110	25	81	11	9	12	3
2036115-M16	M 16	2	110	25	68	12	9	12	3
2036115-M20	M 20	2,5	140	30	95	16	12	15	3
2036115-M22	M 22	2,5	140	30	93	18	14,5	17	3
2036115-M24	M 24	3	160	36	113	18	14,5	17	4
2036115-M27	M 27	3	160	36	97	20	16	19	4
2036115-M30	M 30	3,5	180	42	115	22	18	21	4
2036115-M36	M 36	4	200	48	131	28	22	25	5

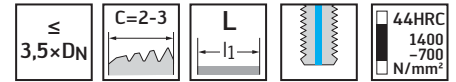


HSS-E machine taps

Paradur® HT



– For long-chipping and short-chipping materials

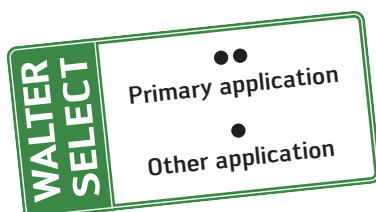


	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●

~DIN 376 L

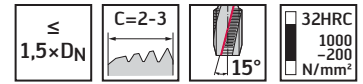
Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
2036155-M8	M 8	1,25	110	18	87	6	4,9	8	3
2036155-M10	M 10	1,5	125	20	102	7	5,5	8	3
2036155-M12	M 12	1,75	140	23	113	9	7	10	3
2036155-M14	M 14	2	140	25	111	11	9	12	3
2036155-M16	M 16	2	160	25	118	12	9	12	3
2036155-M20	M 20	2,5	180	30	135	16	12	15	3
2036155-M22	M 22	2,5	200	30	153	18	14,5	17	3
2036155-M24	M 24	3	200	36	153	18	14,5	17	4
2036155-M27	M 27	3	225	36	162	20	16	19	4
2036155-M30	M 30	3,5	250	42	185	22	18	21	4
2036155-M33	M 33	3,5	275	42	208	25	20	23	4
2036155-M36	M 36	4	300	48	231	28	22	25	5

B5

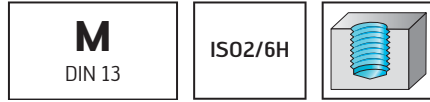


HSS-E machine taps

Paradur® N



– For long-chipping materials



	P	M	K	N	S	H	O
TICN	●	●	●	●	●	●	●
TIN	●	●	●	●	●	●	●
Uncoated	●	●	●	●	●	●	●

DIN 371	Designation TICN	Designation TIN	Designation Uncoated	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	$\square$ mm	N
			20410-M2	M 2	0,4	45	4	9	2,8	2,1	3
			20410-M2.5	M 2.5	0,45	50	4	12,5	2,8	2,1	3
		204105-M3	20410-M3	M 3	0,5	56	6	18	3,5	2,7	3
			20410-M3.5	M 3.5	0,6	56	6,5	20	4	3	3
	2041006-M4	204105-M4	20410-M4	M 4	0,7	63	7	21	4,5	3,4	3
	2041006-M5	204105-M5	20410-M5	M 5	0,8	70	8	25	6	4,9	3
	2041006-M6	204105-M6	20410-M6	M 6	1	80	10	30	6	4,9	3
			20410-M7	M 7	1	80	10	30	7	5,5	3
	2041006-M8	204105-M8	20410-M8	M 8	1,25	90	12	35	8	6,2	3
	2041006-M10	204105-M10	20410-M10	M 10	1,5	100	15	39	10	8	3

l_g dimension in accordance with DIN 10

DIN 376	Designation TICN	Designation TIN	Designation Uncoated	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	$\square$ mm	N
			20460-M3	M 3	0,5	56	6	37	2,2	1,8	3
			20460-M4	M 4	0,7	63	7	43	2,8	2,1	3
			20460-M5	M 5	0,8	70	8	49	3,5	2,7	3
			20460-M6	M 6	1	80	10	59	4,5	3,4	3
			20460-M8	M 8	1,25	90	13	67	6	4,9	3
			20460-M10	M 10	1,5	100	15	77	7	5,5	3
	2046006-M12	204605-M12	20460-M12	M 12	1,75	110	16	83	9	7	3
	2046006-M14	204605-M14	20460-M14	M 14	2	110	20	81	11	9	3
	2046006-M16	204605-M16	20460-M16	M 16	2	110	20	68	12	9	3
			20460-M18	M 18	2,5	125	25	81	14	11	4
	2046006-M20	204605-M20	20460-M20	M 20	2,5	140	25	95	16	12	4
			20460-M22	M 22	2,5	140	25	93	18	14,5	4
			20460-M24	M 24	3	160	30	113	18	14,5	4
			20460-M30	M 30	3,5	180	35	115	22	18	4
			20460-M36	M 36	4	200	40	131	28	22	4

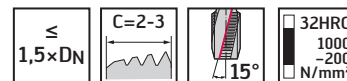
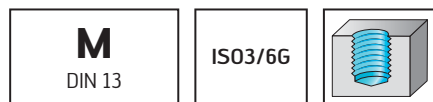
l_g dimension in accordance with DIN 10

HSS-E machine taps

Paradur® N

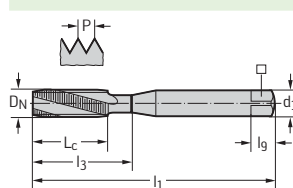


– For long-chipping materials



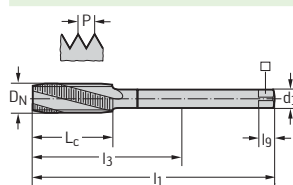
	P	M	K	N	S	H	O
Uncoated	●●	●	●●	●●	●	●	●

DIN 371

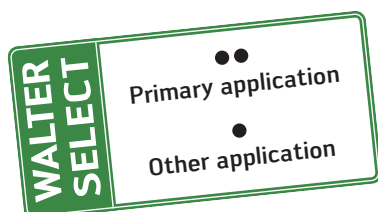


Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
20430-M2	M 2	0,4	45	4	9	2,8	2,1	5	3
20430-M2.5	M 2.5	0,45	50	4	12,5	2,8	2,1	5	3
20430-M3	M 3	0,5	56	6	18	3,5	2,7	6	3
20430-M4	M 4	0,7	63	7	21	4,5	3,4	6	3
20430-M5	M 5	0,8	70	8	25	6	4,9	8	3
20430-M6	M 6	1	80	10	30	6	4,9	8	3
20430-M8	M 8	1,25	90	12	35	8	6,2	9	3
20430-M10	M 10	1,5	100	15	39	10	8	11	3

DIN 376



Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
20480-M12	M 12	1,75	110	16	83	9	7	10	3
20480-M16	M 16	2	110	20	68	12	9	12	3

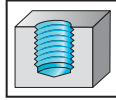


HSS-E machine taps

Paradur® NH

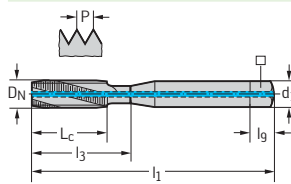


– For long-chipping materials



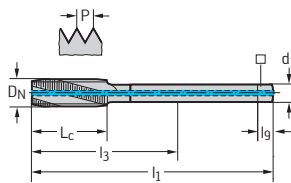
	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●
Uncoated	●	●	●	●	●	●	●

DIN 371



Designation TIN	Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
2041215-M4		M 4	0,7	63	12	21	4,5	3,4	6	3
2041215-M5	2041210-M5	M 5	0,8	70	13	25	6	4,9	8	3
2041215-M6	2041210-M6	M 6	1	80	15	30	6	4,9	8	3
2041215-M8	2041210-M8	M 8	1,25	90	18	35	8	6,2	9	3
2041215-M10	2041210-M10	M 10	1,5	100	20	39	10	8	11	3

DIN 376



Designation TIN	Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
2046215-M12	2046210-M12	M 12	1,75	110	23	83	9	7	10	4

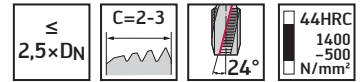
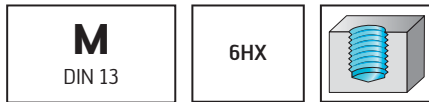


HSS-E-PM machine taps

Paradur® H 24



– For long-chipping materials



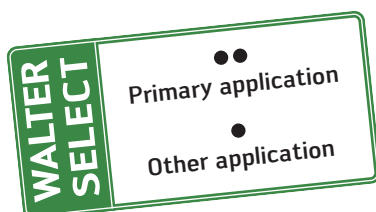
	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

~DIN 371		Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	204107-M3	M 3		0,5	56	11	11	3,5	2,7	6	3
	204107-M4	M 4		0,7	63	15	15	4,5	3,4	6	3
	204107-M5	M 5		0,8	70	18,5	18,5	6	4,9	8	3
	204107-M6	M 6		1	80	15	30	6	4,9	8	3
	204107-M8	M 8		1,25	90	18	38	8	6,2	9	3
	204107-M10	M 10		1,5	100	20	45	10	8	11	3

≤ M 5: Without reduced neck after the thread

DIN 376		Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	204607-M12	M 12		1,75	110	23	83	9	7	10	4
	204607-M16	M 16		2	110	25	68	12	9	12	4

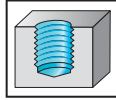
B 5



HSS-E machine taps Paradur® X-pert P

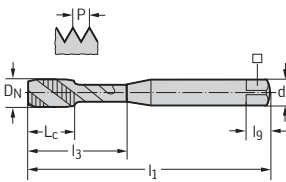


– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

DIN 371



Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
P20509-M2	M 2	0,4	45	4	9	2,8	2,1	5	3
P20509-M2.5	M 2.5	0,45	50	4	12,5	2,8	2,1	5	3
P20509-M3	M 3	0,5	56	6	18	3,5	2,7	6	3
P20509-M4	M 4	0,7	63	7	21	4,5	3,4	6	3
P20509-M5	M 5	0,8	70	8	25	6	4,9	8	3
P20509-M6	M 6	1	80	10	30	6	4,9	8	3
P20509-M7	M 7	1	80	10	30	7	5,5	8	3
P20509-M8	M 8	1,25	90	12	35	8	6,2	9	3
P20509-M10	M 10	1,5	100	15	39	10	8	11	3

B5

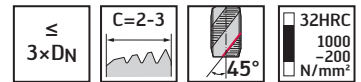
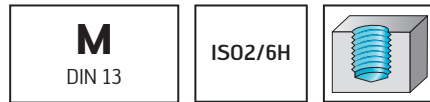


HSS-E machine taps

Paradur® X-pert P



– For long-chipping materials



	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●
Uncoated	●	●	●	●	●	●	●

DIN 371	Designation TIN	Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
		P20519-M1.6	M 1.6	0,35	40	6	6	2,5	2,1	5	2
	P2051905-M2	P20519-M2	M 2	0,4	45	4	9	2,8	2,1	5	3
		P20519-M2.2	M 2.2	0,45	45	4	12	2,8	2,1	5	3
	P2051905-M2.5	P20519-M2.5	M 2.5	0,45	50	4	12,5	2,8	2,1	5	3
		P20519-M2.6	M 2.6	0,45	50	4	12,5	2,8	2,1	5	3
	P2051905-M3	P20519-M3	M 3	0,5	56	6	18	3,5	2,7	6	3
	P2051905-M3.5	P20519-M3.5	M 3.5	0,6	56	6,5	20	4	3	6	3
	P2051905-M4	P20519-M4	M 4	0,7	63	7	21	4,5	3,4	6	3
		P20519-M4.5	M 4.5	0,75	70	8	25	6	4,9	8	3
	P2051905-M5	P20519-M5	M 5	0,8	70	8	25	6	4,9	8	3
	P2051905-M6	P20519-M6	M 6	1	80	10	30	6	4,9	8	3
		P20519-M7	M 7	1	80	10	30	7	5,5	8	3
	P2051905-M8	P20519-M8	M 8	1,25	90	12	35	8	6,2	9	3
	P2051905-M10	P20519-M10	M 10	1,5	100	15	39	10	8	11	3

DIN 376	Designation TIN	Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
		P20569-M4	M 4	0,7	63	7	43	2,8	2,1	5	3
		P20569-M5	M 5	0,8	70	8	49	3,5	2,7	6	3
		P20569-M6	M 6	1	80	10	59	4,5	3,4	6	3
		P20569-M8	M 8	1,25	90	12	67	6	4,9	8	3
		P20569-M9	M 9	1,25	90	13	67	7	5,5	8	3
		P20569-M10	M 10	1,5	100	15	77	7	5,5	8	3
		P20569-M11	M 11	1,5	100	15	76	8	6,2	9	3
	P2056905-M12	P20569-M12	M 12	1,75	110	16	83	9	7	10	3
	P2056905-M14	P20569-M14	M 14	2	110	20	81	11	9	12	3
	P2056905-M16	P20569-M16	M 16	2	110	20	68	12	9	12	3
	P2056905-M18	P20569-M18	M 18	2,5	125	25	81	14	11	14	4
	P2056905-M20	P20569-M20	M 20	2,5	140	25	95	16	12	15	4
		P20569-M22	M 22	2,5	140	25	93	18	14,5	17	4
	P2056905-M24	P20569-M24	M 24	3	160	30	113	18	14,5	17	4
		P20569-M27	M 27	3	160	30	97	20	16	19	4
	P2056905-M30	P20569-M30	M 30	3,5	180	35	115	22	18	21	4
		P20569-M33	M 33	3,5	180	35	113	25	20	23	4
		P20569-M36	M 36	4	200	40	131	28	22	25	4
		P20569-M39	M 39	4	200	40	102	32	24	27	4
		P20569-M42	M 42	4,5	200	45	102	32	24	27	4
		P20569-M45	M 45	4,5	220	45	117	36	29	32	4
		P20569-M48	M 48	5	250	50	147	36	29	32	4
		P20569-M52	M 52	5	250	50	120	40	32	35	5
		P20569-M56	M 56	5,5	250	55	120	40	32	35	5
		P20569-M60	M 60	5,5	280	55	147	45	35	38	5
		P20569-M64	M 64	6	315	60	178	50	39	42	6

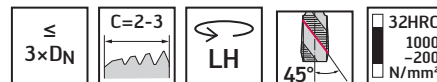
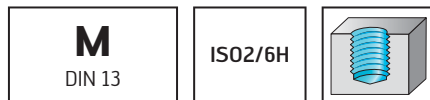
B5

HSS-E machine taps

Paradur® X-pert P

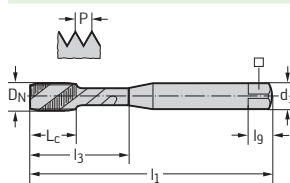


– For long-chipping materials



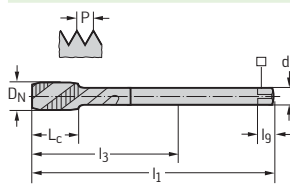
	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

DIN 371



Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
P205198-M3	M 3 - LH	0,5	56	6	18	3,5	2,7	6	3
P205198-M4	M 4 - LH	0,7	63	7	21	4,5	3,4	6	3
P205198-M5	M 5 - LH	0,8	70	8	25	6	4,9	8	3
P205198-M6	M 6 - LH	1	80	10	30	6	4,9	8	3
P205198-M8	M 8 - LH	1,25	90	12	35	8	6,2	9	3
P205198-M10	M 10 - LH	1,5	100	15	39	10	8	11	3

DIN 376



Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
P205698-M12	M 12 - LH	1,75	110	16	83	9	7	10	3
P205698-M14	M 14 - LH	2	110	20	81	11	9	12	3
P205698-M16	M 16 - LH	2	110	20	68	12	9	12	3
P205698-M20	M 20 - LH	2,5	140	25	95	16	12	15	4
P205698-M24	M 24 - LH	3	160	30	113	18	14,5	17	4
P205698-M30	M 30 - LH	3,5	180	35	115	22	18	21	4

B5



B 1008



D 1



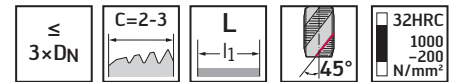
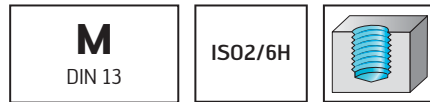
B 709

HSS-E machine taps

Paradur® X-pert P



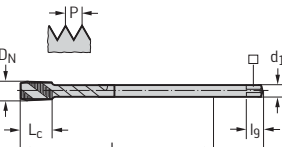
– For long-chipping materials



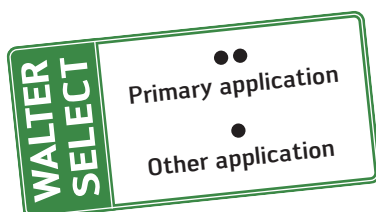
	P	M	K	N	S	H	O
THL	●	●	●	●	●	●	●
Uncoated	●	●	●	●	●	●	●

~DIN 371 L

Designation THL	Designation Uncoated	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	mm	l_9 mm	N
P2051832-M3	P205183-M3	M 3	0,5	112	6	18	3,5	2,7	6	3
P2051832-M4	P205183-M4	M 4	0,7	112	7	21	4,5	3,4	6	3
P2051832-M5	P205183-M5	M 5	0,8	125	8	25	6	4,9	8	3
P2051832-M6	P205183-M6	M 6	1	125	10	30	6	4,9	8	3
P2051832-M8	P205183-M8	M 8	1,25	140	13	40	8	6,2	9	3
P2051832-M10	P205183-M10	M 10	1,5	160	15	50	10	8	11	3

~DIN 376 L											
	Designation THL	Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	 mm	l ₉ mm	N
	P2056832-M8	P205683-M8	M 8	1,25	140	12	117	6	4,9	8	3
	P2056832-M10	P205683-M10	M 10	1,5	160	15	137	7	5,5	8	3
	P2056832-M12	P205683-M12	M 12	1,75	180	16	153	9	7	10	3
	P2056832-M14	P205683-M14	M 14	2	180	20	151	11	9	12	3
	P2056832-M16	P205683-M16	M 16	2	200	20	158	12	9	12	3
	P2056832-M20	P205683-M20	M 20	2,5	224	25	179	16	12	15	4

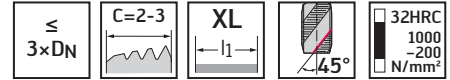
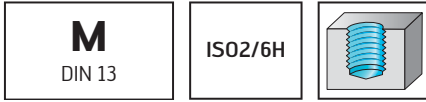
B5



HSS-E machine taps Paradur® X-pert P



– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

~DIN 371 XL

Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
P2051935-M3	M 3	0,5	125	6	18	3,5	2,7	6	3
P2051935-M4	M 4	0,7	125	7	21	4,5	3,4	6	3
P2051935-M5	M 5	0,8	140	8	25	6	4,9	8	3
P2051935-M6	M 6	1	160	10	30	6	4,9	8	3
P2051935-M8	M 8	1,25	180	13	35	8	6,2	9	3
P2051935-M10	M 10	1,5	200	15	39	10	8	11	3

~DIN 376 XL

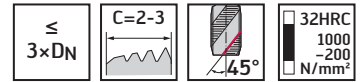
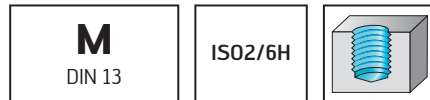
Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
P2056935-M8	M 8	1,25	180	12	157	6	4,9	8	3
P2056935-M10	M 10	1,5	200	15	177	7	5,5	8	3
P2056935-M12	M 12	1,75	220	16	193	9	7	10	3
P2056935-M14	M 14	2	220	20	191	11	9	12	3
P2056935-M16	M 16	2	220	20	178	12	9	12	3
P2056935-M18	M 18	2,5	250	25	206	14	11	14	4
P2056935-M20	M 20	2,5	280	25	235	16	12	15	4

HSS-E machine taps

Paradur® X-pert P AZ



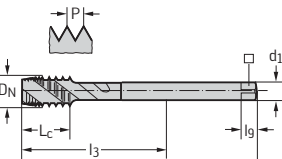
- For long-chipping materials
- For thin-walled workpieces



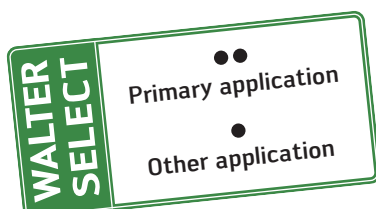
	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

DIN 371

Designation Uncoated	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	mm	l_g mm	N
P40519-M3	M 3	0,5	56	6	18	3,5	2,7	6	3
P40519-M4	M 4	0,7	63	7	21	4,5	3,4	6	3
P40519-M5	M 5	0,8	70	8	25	6	4,9	8	3
P40519-M6	M 6	1	80	10	30	6	4,9	8	3
P40519-M8	M 8	1,25	90	12	35	8	6,2	9	3
P40519-M10	M 10	1,5	100	15	39	10	8	11	3

DIN 376										
	Designation Uncoated	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	 mm	l_g mm	N
	P40569-M12	M 12	1,75	110	16	83	9	7	10	3

B5

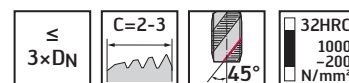
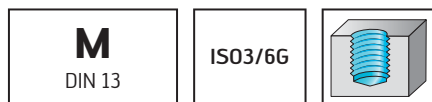


HSS-E machine taps

Paradur® X-pert P

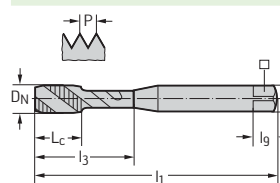


– For long-chipping materials



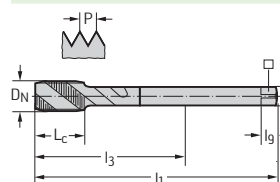
	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●
Uncoated	●	●	●	●	●	●	●

DIN 371



Designation TIN	Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	P20539-M2	M 2	0,4	45	4	9	2,8	2,1	5	3
	P20539-M2.3	M 2.3	0,4	45	4	12	2,8	2,1	5	3
P2053905-M2.5	P20539-M2.5	M 2.5	0,45	50	4	12,5	2,8	2,1	5	3
P2053905-M3	P20539-M3	M 3	0,5	56	6	18	3,5	2,7	6	3
	P20539-M3.5	M 3.5	0,6	56	6,5	20	4	3	6	3
P2053905-M4	P20539-M4	M 4	0,7	63	7	21	4,5	3,4	6	3
P2053905-M5	P20539-M5	M 5	0,8	70	8	25	6	4,9	8	3
P2053905-M6	P20539-M6	M 6	1	80	10	30	6	4,9	8	3
P2053905-M8	P20539-M8	M 8	1,25	90	12	35	8	6,2	9	3
P2053905-M10	P20539-M10	M 10	1,5	100	15	39	10	8	11	3

DIN 376



Designation TIN	Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	P20589-M5	M 5	0,8	70	8	49	3,5	2,7	6	3
	P20589-M6	M 6	1	80	10	59	4,5	3,4	6	3
	P20589-M8	M 8	1,25	90	12	67	6	4,9	8	3
	P20589-M10	M 10	1,5	100	15	77	7	5,5	8	3
P2058905-M12	P20589-M12	M 12	1,75	110	16	83	9	7	10	3
	P20589-M14	M 14	2	110	20	81	11	9	12	3
P2058905-M16	P20589-M16	M 16	2	110	20	68	12	9	12	3

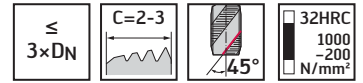
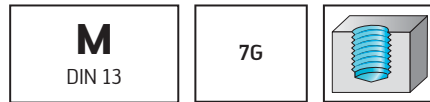


HSS-E machine taps

Paradur® X-pert P

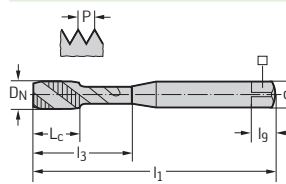


– For long-chipping materials



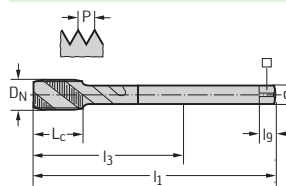
	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●
Uncoated	●	●	●	●	●	●	●

DIN 371

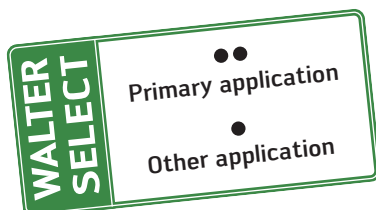


Designation TIN	Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	P20549-M2	M 2	0,4	45	4	9	2,8	2,1	5	3
	P20549-M2.5	M 2.5	0,45	50	4	12,5	2,8	2,1	5	3
P2054905-M3	P20549-M3	M 3	0,5	56	6	18	3,5	2,7	6	3
P2054905-M4	P20549-M4	M 4	0,7	63	7	21	4,5	3,4	6	3
P2054905-M5	P20549-M5	M 5	0,8	70	8	25	6	4,9	8	3
P2054905-M6	P20549-M6	M 6	1	80	10	30	6	4,9	8	3
P2054905-M8	P20549-M8	M 8	1,25	90	12	35	8	6,2	9	3
P2054905-M10	P20549-M10	M 10	1,5	100	15	39	10	8	11	3

DIN 376



Designation TIN	Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	P20599-M8	M 8	1,25	90	12	67	6	4,9	8	3
	P20599-M10	M 10	1,5	100	15	77	7	5,5	8	3
P2059905-M12	P20599-M12	M 12	1,75	110	16	83	9	7	10	3
P2059905-M16	P20599-M16	M 16	2	110	20	68	12	9	12	3
P2059905-M20	P20599-M20	M 20	2,5	140	25	95	16	12	15	4
P2059905-M24	P20599-M24	M 24	3	160	30	113	18	14,5	17	4

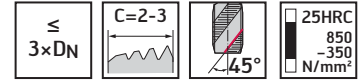


HSS-E-PM machine taps

Paradur® Secur

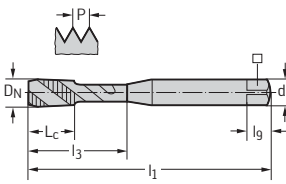


– For long-chipping materials



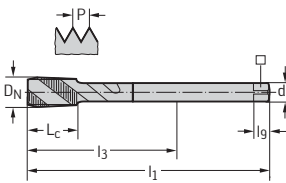
	P	M	K	N	S	H	O
TIN	●●			●●			

~DIN 371



Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
E2051905-M4	M 4	0,7	63	7	14,8	4,5	3,4	6	3
E2051905-M5	M 5	0,8	70	8	20,7	6	4,9	8	3
E2051905-M6	M 6	1	80	10	25	6	4,9	8	3
E2051905-M8	M 8	1,25	90	12	35	8	6,2	9	3
E2051905-M10	M 10	1,5	100	15	39	10	8	11	3

DIN 376



Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
E2056905-M12	M 12	1,75	110	16	83	9	7	10	4
E2056905-M16	M 16	2	110	20	68	12	9	12	4
E2056905-M20	M 20	2,5	140	25	95	16	12	15	4
E2056905-M24	M 24	3	160	30	113	18	14,5	17	4
E2056905-M30	M 30	3,5	180	35	115	22	18	21	5

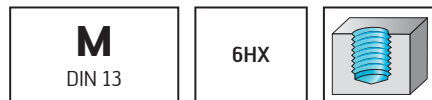


HSS-E machine taps

Paradur® Short Chip HT

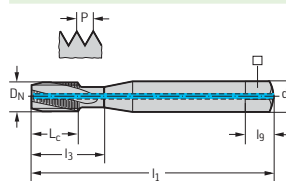


– For long-chipping materials



	P	M	K	N	S	H	O
THL	●	●	●	●	●	●	●
THL/uncoated	●	●	●	●	●	●	●

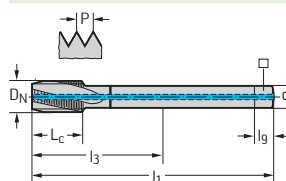
DIN 371



Designation THL	Designation THL/uncoated	DN	P mm	l ₁ mm	l _C mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
20410T2-M5	20410TR-M5	M 5	0,8	70	8	25	6	4,9	8	3
20410T2-M6	20410TR-M6	M 6	1	80	10	30	6	4,9	8	3
20410T2-M8	20410TR-M8	M 8	1,25	90	12	35	8	6,2	9	3
20410T2-M10	20410TR-M10	M 10	1,5	100	15	39	10	8	11	3

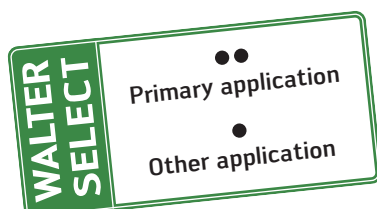
20410TR: Uncoated rake

DIN 376



Designation THL	Designation THL/uncoated	DN	P mm	l ₁ mm	l _C mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
20460T2-M12	20460TR-M12	M 12	1,75	110	16	83	9	7	10	3

20460TR: Uncoated rake

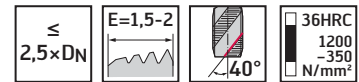


HSS-E machine taps

Paradur® STE



– For long-chipping materials



	P	M	K	N	S	H	O
THL	●	●	●	●	●	●	●
Uncoated	●	●	●	●	●	●	●

DIN 371	Designation THL	Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
	2051062-M3	205106-M3	M 3	0,5	56	6	18	3,5	2,7	6	3
	2051062-M4	205106-M4	M 4	0,7	63	7	21	4,5	3,4	6	3
	2051062-M5	205106-M5	M 5	0,8	70	8	25	6	4,9	8	3
	2051062-M6	205106-M6	M 6	1	80	10	30	6	4,9	8	3
	2051062-M8	205106-M8	M 8	1,25	90	12	35	8	6,2	9	4
	2051062-M10	205106-M10	M 10	1,5	100	15	39	10	8	11	4

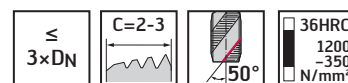
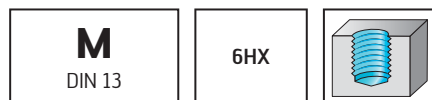
DIN 376	Designation THL	Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
	2056062-M12	205606-M12	M 12	1,75	110	16	83	9	7	10	4
	2056062-M16	205606-M16	M 16	2	110	20	68	12	9	12	5
	2056062-M20		M 20	2,5	140	25	95	16	12	15	5
	2056062-M24		M 24	3	160	30	113	18	14,5	17	5

HSS-E machine taps

TC142 Supreme

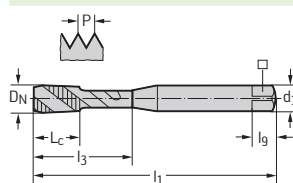


– For long-chipping materials



	P	M	K	N	S	H	O
WW60RB	●	●●					
WY80FC	●	●●					

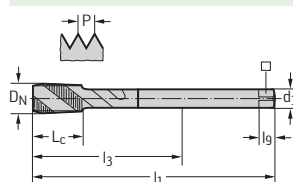
DIN 371



Designation	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N	WW60RB	WY80FC
TC142-M1.6-C0-	M 1.6	0,35	40	6	6	2,5	2,1	5	2		✱
TC142-M2-C0-	M 2	0,4	45	4	9	2,8	2,1	5	3	✱	✱
TC142-M2.3-C0-	M 2.3	0,4	45	4	12	2,8	2,1	5	3		✱
TC142-M2.5-C0-	M 2.5	0,45	50	4	12,5	2,8	2,1	5	3		✱
TC142-M2.6-C0-	M 2.6	0,45	50	4	12,5	2,8	2,1	5	3		✱
TC142-M3-C0-	M 3	0,5	56	6	18	3,5	2,7	6	3	✱	✱
TC142-M4-C0-	M 4	0,7	63	7	21	4,5	3,4	6	3	✱	✱
TC142-M5-C0-	M 5	0,8	70	8	25	6	4,9	8	3	✱	✱
TC142-M6-C0-	M 6	1	80	10	30	6	4,9	8	3	✱	✱
TC142-M8-C0-	M 8	1,25	90	12	35	8	6,2	9	3	✱	✱
TC142-M10-C0-	M 10	1,5	100	15	39	10	8	11	3	✱	✱

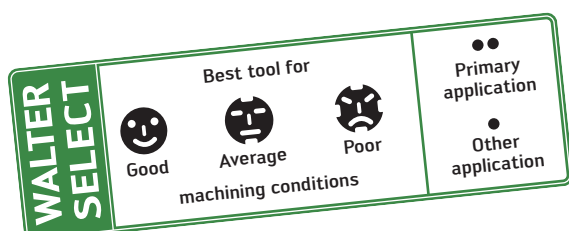
Ordering example for the WY80FC grade: TC142-M1.6-C0-WY80FC

DIN 376



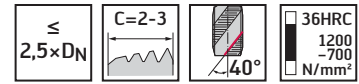
Designation	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N	WW60RB	WY80FC
TC142-M6-L0-	M 6	1	80	10	59	4,5	3,4	6	3		✱
TC142-M8-L0-	M 8	1,25	90	12	67	6	4,9	8	3		✱
TC142-M10-L0-	M 10	1,5	100	15	77	7	5,5	8	3	✱	✱
TC142-M12-L0-	M 12	1,75	110	16	83	9	7	10	3	✱	✱
TC142-M14-L0-	M 14	2	110	20	81	11	9	12	3	✱	✱
TC142-M16-L0-	M 16	2	110	20	68	12	9	12	4	✱	✱
TC142-M18-L0-	M 18	2,5	125	25	81	14	11	14	4	✱	
TC142-M20-L0-	M 20	2,5	140	25	95	16	12	15	4	✱	✱
TC142-M24-L0-	M 24	3	160	30	113	18	14,5	17	4	✱	
TC142-M27-L0-	M 27	3	160	30	97	20	16	19	4		✱
TC142-M30-L0-	M 30	3,5	180	35	115	22	18	21	5		✱
TC142-M33-L0-	M 33	3,5	180	35	113	25	20	23	5		✱
TC142-M36-L0-	M 36	4	200	40	131	28	22	25	5		✱

Ordering example for the WY80FC grade: TC142-M6-L0-WY80FC

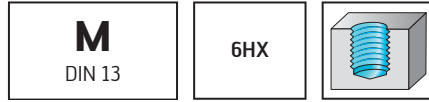


HSS-E machine taps

Paradur® X-pert M

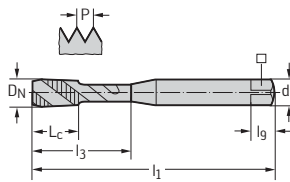


– For long-chipping materials



	P	M	K	N	S	H	O
TICN	●	●●	■	■	■	■	■
TIN	●	●●	■	■	■	■	■
VAP	●	●●	■	■	■	■	■

DIN 371



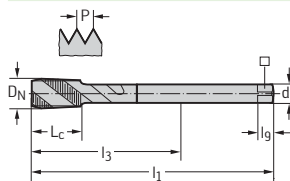
Designation TICN	Designation TIN	Designation VAP	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	N
		M20513-M1.6	M 1.6	0,35	40	6	6	2,5	2,1	3
		M20513-M1.7	M 1.7	0,35	40	6	6	2,5	2,1	3
		M20513-M1.8	M 1.8	0,35	40	6	6	2,5	2,1	3
M2051306-M2	M2051305-M2	M20513-M2	M 2	0,4	45	4	9	2,8	2,1	3
M2051306-M2.5	M2051305-M2.5	M20513-M2.5	M 2.5	0,45	50	4	12,5	2,8	2,1	3
M2051306-M3	M2051305-M3	M20513-M3	M 3	0,5	56	6	18	3,5	2,7	3
		M20513-M3.5	M 3.5	0,6	56	6,5	20	4	3	3
M2051306-M4	M2051305-M4	M20513-M4	M 4	0,7	63	7	21	4,5	3,4	3
		M20513-M4.5	M 4.5	0,75	70	8	25	6	4,9	3
M2051306-M5	M2051305-M5	M20513-M5	M 5	0,8	70	8	25	6	4,9	3
M2051306-M6	M2051305-M6	M20513-M6	M 6	1	80	10	30	6	4,9	3
		M20513-M7	M 7	1	80	10	30	7	5,5	3
M2051306-M8	M2051305-M8	M20513-M8	M 8	1,25	90	12	35	8	6,2	3
M2051306-M10	M2051305-M10	M20513-M10	M 10	1,5	100	15	39	10	8	3

≤ M 1.8: Without reduced neck after the thread

≤ M 2.5: Without thread taper

l_g dimension in accordance with DIN 10

DIN 376



Designation TICN	Designation TIN	Designation VAP	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	N
M2056306-M6		M20563-M6	M 6	1	80	10	59	4,5	3,4	3
M2056306-M8		M20563-M8	M 8	1,25	90	12	67	6	4,9	3
M2056306-M10		M20563-M10	M 10	1,5	100	15	77	7	5,5	3
M2056306-M12	M2056305-M12	M20563-M12	M 12	1,75	110	16	83	9	7	4
		M20563-M14	M 14	2	110	20	81	11	9	4
M2056306-M16	M2056305-M16	M20563-M16	M 16	2	110	20	68	12	9	4
		M20563-M18	M 18	2,5	125	25	81	14	11	4
M2056306-M20	M2056305-M20	M20563-M20	M 20	2,5	140	25	95	16	12	4
		M20563-M22	M 22	2,5	140	25	93	18	14,5	4
M2056306-M24		M20563-M24	M 24	3	160	30	113	18	14,5	4
		M20563-M27	M 27	3	160	30	97	20	16	5
M2056306-M30		M20563-M30	M 30	3,5	180	35	115	22	18	5
		M20563-M33	M 33	3,5	180	35	113	25	20	5
		M20563-M36	M 36	4	200	40	131	28	22	5
		M20563-M42	M 42	4,5	200	45	102	32	24	5

l_g dimension in accordance with DIN 10

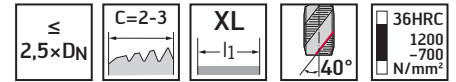


HSS-E machine taps

Paradur® X-pert M



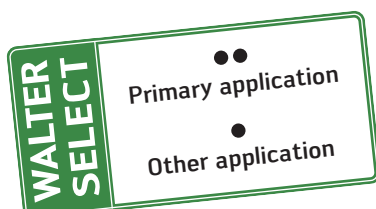
– For long-chipping materials



	P	M	K	N	S	H	O
THL	●	●●					

~DIN 371 XL										
	Designation THL	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	 mm	l ₉ mm	N
	M2051332-M4	M 4	0,7	125	7	21	4,5	3,4	6	3
	M2051332-M5	M 5	0,8	140	8	25	6	4,9	8	3
	M2051332-M6	M 6	1	160	10	30	6	4,9	8	3

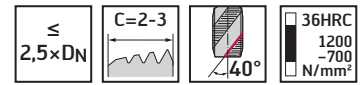
~DIN 376 XL		Designation THL	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	M2056332-M8	M 8	1,25	180	12	157	6	4,9	8	3	
	M2056332-M10	M 10	1,5	200	15	177	7	5,5	8	3	
	M2056332-M12	M 12	1,75	220	16	193	9	7	10	4	
	M2056332-M16	M 16	2	220	20	178	12	9	12	4	
	M2056332-M20	M 20	2,5	280	25	235	16	12	15	4	



HSS-E machine taps Paradur® X-pert M



– For long-chipping materials



	P	M	K	N	S	H	O
TICN	●	●●					
VAP	●	●●					

DIN 371												
	Designation TICN	Designation VAP	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N	
	M2053306-M3	M20533-M3	M 3	0,5	56	6	18	3,5	2,7	6	3	
	M2053306-M4	M20533-M4	M 4	0,7	63	7	21	4,5	3,4	6	3	
	M2053306-M5	M20533-M5	M 5	0,8	70	8	25	6	4,9	8	3	
	M2053306-M6	M20533-M6	M 6	1	80	10	30	6	4,9	8	3	
	M2053306-M8	M20533-M8	M 8	1,25	90	12	35	8	6,2	9	3	
	M2053306-M10	M20533-M10	M 10	1,5	100	15	39	10	8	11	3	

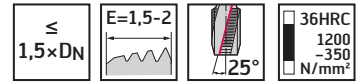
B5

HSS-E machine taps

Paradur Inox® 25



– For long-chipping materials

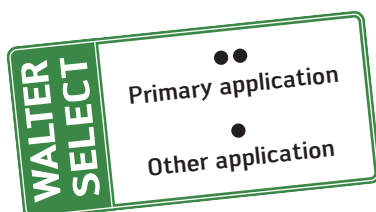


	P	M	K	N	S	H	O
TIN	●●	●●					

~DIN 371		Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
		2051315-M5	M 5	0,8	70	8	19	6	4,9	8	4
		2051315-M6	M 6	1	80	10	22	6	4,9	8	4
		2051315-M8	M 8	1,25	90	13	28	8	6,2	9	5
		2051315-M10	M 10	1,5	100	15	32	10	8	11	5

DIN 376		Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
		2056315-M12	M 12	1,75	110	16	83	9	7	10	5
		2056315-M14	M 14	2	110	20	81	11	9	12	5
		2056315-M16	M 16	2	110	20	68	12	9	12	5
		2056315-M20	M 20	2,5	140	25	95	16	12	15	5

B5

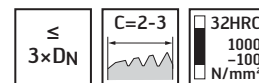


HSS-E-PM machine taps

Paradur® Eco CI

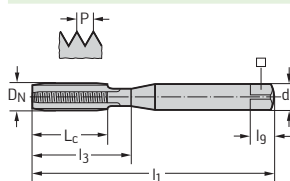


- For short-chipping materials
- Nitrided



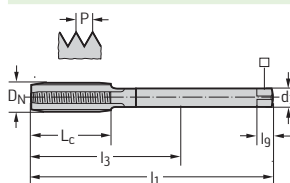
	P	M	K	N	S	H	O
TICN			●●	●●			●●
NID			●●	●●			●●

DIN 371



Designation TICN	Designation NID	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
E2031406-M3	E20314-M3	M 3	0,5	56	9	18	3,5	2,7	6	3
E2031406-M4	E20314-M4	M 4	0,7	63	12	21	4,5	3,4	6	3
E2031406-M5	E20314-M5	M 5	0,8	70	13	25	6	4,9	8	4
E2031406-M6	E20314-M6	M 6	1	80	15	30	6	4,9	8	4
E2031406-M7	E20314-M7	M 7	1	80	15	30	7	5,5	8	4
E2031406-M8	E20314-M8	M 8	1,25	90	18	35	8	6,2	9	4
E2031406-M9		M 9	1,25	90	18	35	9	7	10	4
E2031406-M10	E20314-M10	M 10	1,5	100	20	39	10	8	11	4

DIN 376



Designation TICN	Designation NID	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
E2036406-M12	E20364-M12	M 12	1,75	110	23	83	9	7	10	4
E2036406-M14	E20364-M14	M 14	2	110	25	81	11	9	12	4
E2036406-M16	E20364-M16	M 16	2	110	25	68	12	9	12	4
E2036406-M18	E20364-M18	M 18	2,5	125	30	81	14	11	14	4
E2036406-M20	E20364-M20	M 20	2,5	140	30	95	16	12	15	4
E2036406-M22	E20364-M22	M 22	2,5	140	30	93	18	14,5	17	4
E2036406-M24	E20364-M24	M 24	3	160	36	113	18	14,5	17	5
E2036406-M30	E20364-M30	M 30	3,5	180	42	115	22	18	21	5

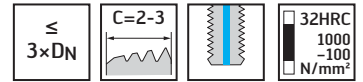
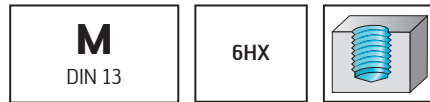


HSS-E-PM machine taps

Paradur® Eco CI



- For short-chipping materials
- Nitrided



TICN	P	M	K	N	S	H	O
			●●	●●			●●

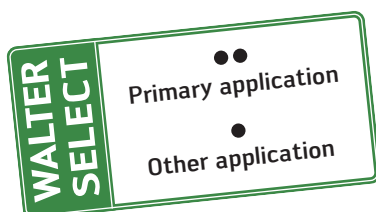
DIN 371

Designation TICN	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	 mm	l_9 mm	N
E2031416-M4	M 4	0,7	63	12	21	4,5	3,4	6	3
E2031416-M5	M 5	0,8	70	13	25	6	4,9	8	4
E2031416-M6	M 6	1	80	15	30	6	4,9	8	4
E2031416-M8	M 8	1,25	90	18	35	8	6,2	9	4
E2031416-M10	M 10	1,5	100	20	39	10	8	11	4

DIN 376

Designation TICN	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	 mm	l_9 mm	N
E2036416-M12	M 12	1,75	110	23	83	9	7	10	4
E2036416-M14	M 14	2	110	25	81	11	9	12	4
E2036416-M16	M 16	2	110	25	68	12	9	12	4
E2036416-M18	M 18	2,5	125	30	81	14	11	14	4
E2036416-M20	M 20	2,5	140	30	95	16	12	15	4
E2036416-M24	M 24	3	160	36	113	18	14,5	17	5

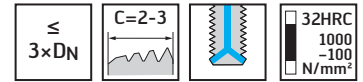
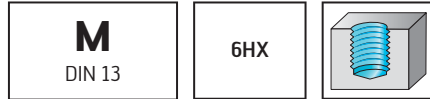
B5



HSS-E-PM machine taps Paradur® Eco CI



- For short-chipping materials
- Nitrided



	P	M	K	N	S	H	O
TICN			●●	●●			●●

DIN 371										
	Designation TICN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	E2031446-M6	M 6	1	80	15	30	6	4,9	8	4
	E2031446-M8	M 8	1,25	90	18	35	8	6,2	9	4
	E2031446-M10	M 10	1,5	100	20	39	10	8	11	4

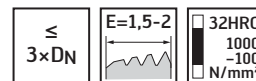
DIN 376										
	Designation TICN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	E2036446-M12	M 12	1,75	110	23	83	9	7	10	4
	E2036446-M16	M 16	2	110	25	68	12	9	12	4

HSS-E-PM machine taps

Paradur® Eco CI

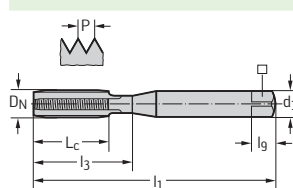


- For short-chipping materials
- Nitrided



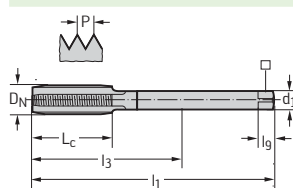
	P	M	K	N	S	H	O
TICN			●●	●●			●●

DIN 371

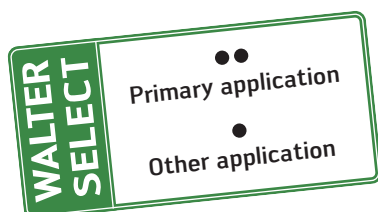


Designation TICN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
E2031466-M4	M 4	0,7	63	12	21	4,5	3,4	6	3
E2031466-M5	M 5	0,8	70	13	25	6	4,9	8	4
E2031466-M6	M 6	1	80	15	30	6	4,9	8	4
E2031466-M8	M 8	1,25	90	18	35	8	6,2	9	4
E2031466-M10	M 10	1,5	100	20	39	10	8	11	4

DIN 376



Designation TICN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
E2036466-M12	M 12	1,75	110	23	83	9	7	10	4
E2036466-M16	M 16	2	110	25	68	12	9	12	4
E2036466-M20	M 20	2,5	140	30	95	16	12	15	4
E2036466-M24	M 24	3	160	36	113	18	14,5	17	5

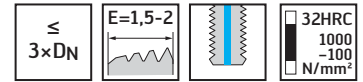


HSS-E-PM machine taps

Paradur® Eco CI



- For short-chipping materials
- Nitrided



	P	M	K	N	S	H	O
TICN			●●	●●			●●

DIN 371										
	Designation	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	□ mm	l_g mm	N
	TICN									
	E2031456-M4	M 4	0,7	63	12	21	4,5	3,4	6	3
	E2031456-M5	M 5	0,8	70	13	25	6	4,9	8	4
	E2031456-M6	M 6	1	80	15	30	6	4,9	8	4
	E2031456-M8	M 8	1,25	90	18	35	8	6,2	9	4
	E2031456-M10	M 10	1,5	100	20	39	10	8	11	4

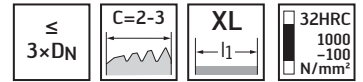
DIN 376										
	Designation	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	□ mm	l_g mm	N
	TICN									
	E2036456-M12	M 12	1,75	110	23	83	9	7	10	4
	E2036456-M16	M 16	2	110	25	68	12	9	12	4
	E2036456-M20	M 20	2,5	140	30	95	16	12	15	4

HSS-E-PM machine taps

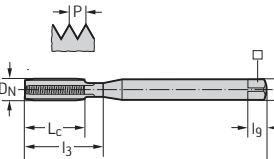
Paradur® Eco CI

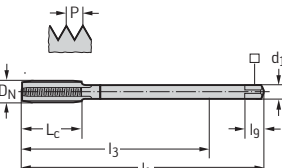


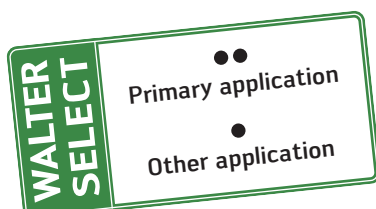
- For short-chipping materials
- Nitrided



	P	M	K	N	S	H	O
TICN			●●	●●			●●

~DIN 371 XL										
	Designation TICN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	 mm	l ₉ mm	N
	E2031436-M4	M 4	0,7	125	12	21	4,5	3,4	6	3
	E2031436-M5	M 5	0,8	140	13	25	6	4,9	8	4
	E2031436-M6	M 6	1	160	15	30	6	4,9	8	4
	E2031436-M8	M 8	1,25	180	18	35	8	6,2	9	4
	E2031436-M10	M 10	1,5	200	20	39	10	8	11	4

~DIN 376 XL										
	Designation TICN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	 mm	l _g mm	N
	E2036436-M12	M 12	1,75	220	23	193	9	7	10	4
	E2036436-M16	M 16	2	220	25	178	12	9	12	4
	E2036436-M20	M 20	2,5	280	30	235	16	12	15	4

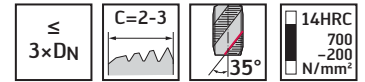
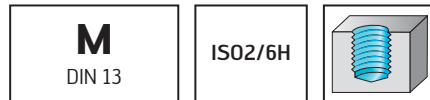


HSS-E machine taps

Paradur® X-pert N



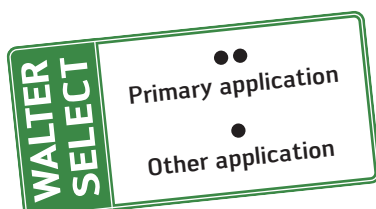
– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated				●	●		●

DIN 371		Designation Uncoated	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	$\square$ mm	l_g mm	N
		N20516-M1.6	M 1.6	0,35	40	6	6	2,5	2,1	5	2
		N20516-M2	M 2	0,4	45	4	9	2,8	2,1	5	2
		N20516-M2.3	M 2.3	0,4	45	4	12	2,8	2,1	5	2
		N20516-M2.5	M 2.5	0,45	50	4	12,5	2,8	2,1	5	2
		N20516-M3	M 3	0,5	56	6	18	3,5	2,7	6	2
		N20516-M3.5	M 3.5	0,6	56	6,5	20	4	3	6	2
		N20516-M4	M 4	0,7	63	7	21	4,5	3,4	6	2
		N20516-M5	M 5	0,8	70	8	25	6	4,9	8	2
		N20516-M6	M 6	1	80	10	30	6	4,9	8	2
		N20516-M8	M 8	1,25	90	12	35	8	6,2	9	2
		N20516-M10	M 10	1,5	100	15	39	10	8	11	2

DIN 376		Designation Uncoated	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	$\square$ mm	l_g mm	N
		N20566-M6	M 6	1	80	10	59	4,5	3,4	6	2
		N20566-M8	M 8	1,25	90	12	67	6	4,9	8	2
		N20566-M10	M 10	1,5	100	15	77	7	5,5	8	2
		N20566-M12	M 12	1,75	110	16	83	9	7	10	3
		N20566-M14	M 14	2	110	20	81	11	9	12	3
		N20566-M16	M 16	2	110	20	68	12	9	12	3
		N20566-M20	M 20	2,5	140	25	95	16	12	15	3

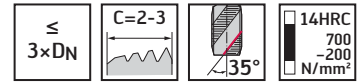


HSS-E machine taps

Paradur® X-pert N



- Increased number of flutes
- For long-chipping materials



	P	M	K	N	S	H	O
Uncoated				●	●		●

DIN 371										
	Designation	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm		l_9 mm	N
	Uncoated									
	N205166-M3	M 3	0,5	56	6	18	3,5	2,7	6	3
	N205166-M4	M 4	0,7	63	7	21	4,5	3,4	6	3
	N205166-M5	M 5	0,8	70	8	25	6	4,9	8	3
	N205166-M6	M 6	1	80	10	30	6	4,9	8	3
	N205166-M7	M 7	1	80	10	30	7	5,5	8	3
	N205166-M8	M 8	1,25	90	12	35	8	6,2	9	3
	N205166-M10	M 10	1,5	100	15	39	10	8	11	3

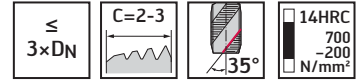
B5

HSS-E machine taps

Paradur® X-pert N

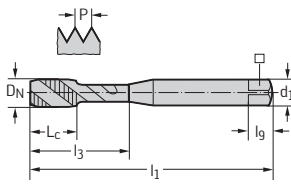


– For long-chipping materials

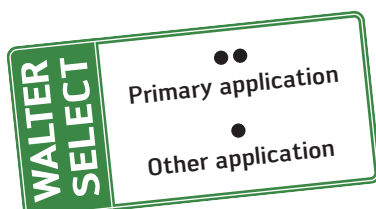


	P	M	K	N	S	H	O
Uncoated				●	●		●

DIN 371



Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	h ₉ mm	 mm	l ₉ mm	N
N20536-M2	M 2	0,4	45	4	9	2,8	2,1	5	2
N20536-M2.5	M 2.5	0,45	50	4	12,5	2,8	2,1	5	2
N20536-M3	M 3	0,5	56	6	18	3,5	2,7	6	2
N20536-M4	M 4	0,7	63	7	21	4,5	3,4	6	2
N20536-M5	M 5	0,8	70	8	25	6	4,9	8	2
N20536-M6	M 6	1	80	10	30	6	4,9	8	2
N20536-M8	M 8	1,25	90	12	35	8	6,2	9	2

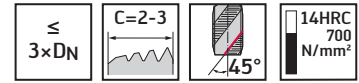


HSS-E machine taps

Paradur® WLM Synchrospeed



- For long-chipping materials
- Only for synchronous machining (rigid tapping)



	P	M	K	N	S	H	O
CRN	●	●	●	●	●	●	●
Uncoated	●	●	●	●	●	●	●

~DIN 371		Designation CRN	Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	□ mm	l _g mm	N
		S2051604-M3	S20516-M3	M 3	0,5	70	6	18	6	4,9	8	2
		S2051604-M4	S20516-M4	M 4	0,7	70	7	21	6	4,9	8	2
		S2051604-M5	S20516-M5	M 5	0,8	70	8	25	6	4,9	8	2
		S2051604-M6	S20516-M6	M 6	1	80	10	30	6	4,9	8	2
		S2051604-M8	S20516-M8	M 8	1,25	90	12	35	8	6,2	9	2
		S2051604-M10	S20516-M10	M 10	1,5	100	15	39	10	8	11	2

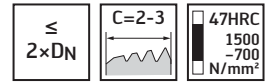
B5

HSS-E machine taps

Paradur® AP

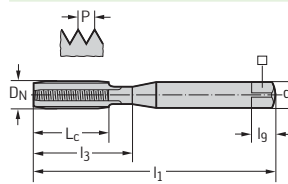


- For short-chipping materials
- For Ampco



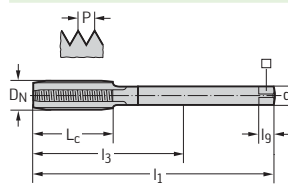
	P	M	K	N	S	H	O
NIT				●●	●		

DIN 371

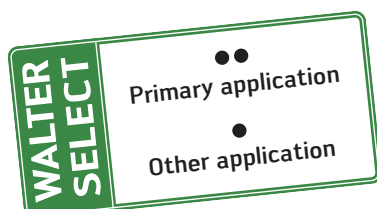


Designation NIT	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	$\square$ mm	l_g mm	N
20312-M3	M 3	0,5	56	9	18	3,5	2,7	6	3
20312-M4	M 4	0,7	63	12	21	4,5	3,4	6	3
20312-M5	M 5	0,8	70	13	25	6	4,9	8	3
20312-M6	M 6	1	80	15	30	6	4,9	8	3
20312-M8	M 8	1,25	90	18	35	8	6,2	9	3
20312-M10	M 10	1,5	100	20	39	10	8	11	3

DIN 376



Designation NIT	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	$\square$ mm	l_g mm	N
20362-M12	M 12	1,75	110	23	83	9	7	10	4
20362-M16	M 16	2	110	25	68	12	9	12	4
20362-M20	M 20	2,5	140	30	95	16	12	15	4

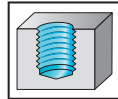
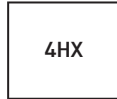


HSS-E-PM machine taps

Paradur® Ni

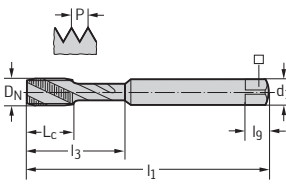


– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●				●●		

~DIN 371



Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
204104-M2	M 2	0,4	45	8	8	2,8	2,1	5	3
204104-M3	M 3	0,5	56	10	10	3,5	2,7	6	3
204104-M3.5	M 3.5	0,6	56	12	12	4	3	6	3
204104-M4	M 4	0,7	63	13	13	4,5	3,4	6	3
204104-M5	M 5	0,8	70	16	16	6	4,9	8	3
204104-M6	M 6	1	80	15	23	6	4,9	8	3
204104-M8	M 8	1,25	90	18	29,5	8	6,2	9	3
204104-M10	M 10	1,5	100	20	33,5	10	8	11	4

≤ M 5: Without reduced neck after the thread

B5

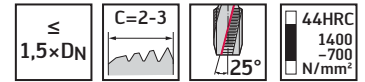


HSS-E-PM machine taps

Paradur® Ni



– For long-chipping materials

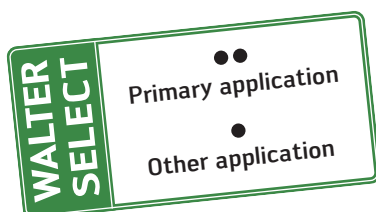


	P	M	K	N	S	H	O
Uncoated	●				●●		

~DIN 371										
	Designation	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	□ mm	l_g mm	N
	Uncoated									
	204102-M2	M 2	0,4	45	8	8	2,8	2,1	5	3
	204102-M2.5	M 2.5	0,45	50	9	30	2,8	2,1	5	3
	204102-M3	M 3	0,5	56	10	35	3,5	2,7	6	3
	204102-M3.5	M 3.5	0,6	56	12	12	4	3	6	3
	204102-M4	M 4	0,7	63	13	42	4,5	3,4	6	3
	204102-M5	M 5	0,8	70	16	16	6	4,9	8	3
	204102-M6	M 6	1	80	15	23	6	4,9	8	3
	204102-M8	M 8	1,25	90	18	29,5	8	6,2	9	3
	204102-M10	M 10	1,5	100	20	33,5	10	8	11	4

≤ M 5: Without reduced neck after the thread

DIN 376										
	Designation	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	□ mm	l_g mm	N
	Uncoated									
	204602-M12	M 12	1,75	110	23	83	9	7	10	4
	204602-M14	M 14	2	110	25	81	11	9	12	4
	204602-M16	M 16	2	110	25	68	12	9	12	4
	204602-M18	M 18	2,5	125	30	81	14	11	14	5
	204602-M20	M 20	2,5	140	30	95	16	12	15	5

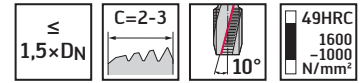
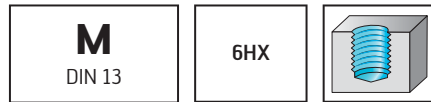


HSS-E-PM machine taps

Paradur® Ni 10



– For long-chipping and short-chipping materials



	P	M	K	N	S	H	O
TIN	●●			●	●●		
Uncoated	●●			●	●●		

~DIN 371	Designation TIN	Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	2041015-M3	204101-M3	M 3	0,5	56	8	35	3,5	2,7	6	3
	2041015-M4	204101-M4	M 4	0,7	63	10,5	42	4,5	3,4	6	3
	2041015-M5	204101-M5	M 5	0,8	70	13	47	6	4,9	8	3
	2041015-M6	204101-M6	M 6	1	80	16	57	6	4,9	8	3
	2041015-M8	204101-M8	M 8	1,25	90	20,5	66	8	6,2	9	3
	2041015-M10	204101-M10	M 10	1,5	100	25,5	72	10	8	11	3
	2041015-M12	204101-M12	M 12	1,75	110	30,5	68	12	9	12	4
	2041015-M16	204101-M16	M 16	2	110	39,5	65	16	12	15	4

Without reduced neck after the thread

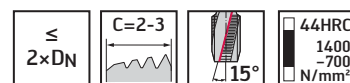
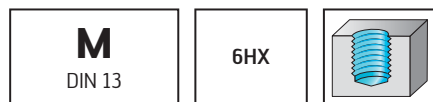
B5

HSS-E-PM machine taps

Paradur® Ti



– For long-chipping materials



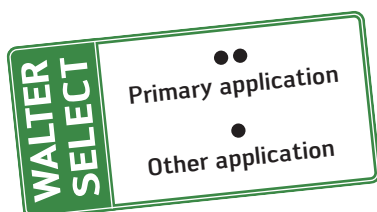
	P	M	K	N	S	H	O
TICN	●●			●	●●		
Uncoated	●●			●	●●		

~DIN 371		Designation TICN	Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
			20416-M1	M 1	0,25	40	5	5	2,5	2,1	5	3
			20416-M1.2	M 1.2	0,25	40	5	5	2,5	2,1	5	3
			20416-M1.4	M 1.4	0,3	40	5	5	2,5	2,1	5	3
			20416-M1.6	M 1.6	0,35	40	5	5	2,5	2,1	5	3
			20416-M1.8	M 1.8	0,35	40	5	5	2,5	2,1	5	3
		2041606-M2	20416-M2	M 2	0,4	45	8	8	2,8	2,1	5	3
			20416-M2.2	M 2.2	0,45	45	8	8	2,8	2,1	5	3
		2041606-M2.5	20416-M2.5	M 2.5	0,45	50	9	30	2,8	2,1	5	3
		2041606-M3	20416-M3	M 3	0,5	56	10	35	3,5	2,7	6	3
			20416-M3.5	M 3.5	0,6	56	12	12	4	3	6	3
		2041606-M4	20416-M4	M 4	0,7	63	13	42	4,5	3,4	6	3
			20416-M4.5	M 4.5	0,75	70	16	16	6	4,9	8	3
		2041606-M5	20416-M5	M 5	0,8	70	16	16	6	4,9	8	3
		2041606-M6	20416-M6	M 6	1	80	15	23	6	4,9	8	3
		2041606-M8	20416-M8	M 8	1,25	90	18	29,5	8	6,2	9	3
		2041606-M10	20416-M10	M 10	1,5	100	20	33,5	10	8	11	3

≤ M 1.4: 5HX

≤ M 5: Without reduced neck after the thread

DIN 376		Designation TICN	Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
		2046606-M12	20466-M12	M 12	1,75	110	23	83	9	7	10	4
			20466-M14	M 14	2	110	25	81	11	9	12	4
		2046606-M16	20466-M16	M 16	2	110	25	68	12	9	12	4
			20466-M20	M 20	2,5	140	30	95	16	12	15	4
			20466-M24	M 24	3	160	36	113	18	14,5	17	5
			20466-M27	M 27	3	160	36	97	20	16	19	5
			20466-M30	M 30	3,5	180	42	115	22	18	21	5
			20466-M33	M 33	3,5	180	42	113	25	20	23	5
			20466-M36	M 36	4	200	48	131	28	22	25	5

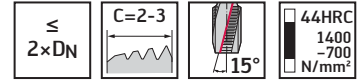
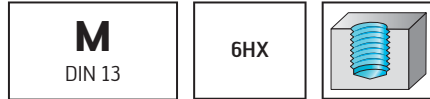


HSS-E-PM machine taps

Paradur® Ti Plus



– For long-chipping materials



ACN	P	M	K	N	S	H	O
					●●		

~DIN 371										
	Designation	D_N	P	l_1	L_c	l_3	d_1	$\square$	l_g	N
	ACN									
	2041663-M2	M 2	0,4	45	8	8	2,8	2,1	5	3
	2041663-M2.5	M 2.5	0,45	50	9	30	2,8	2,1	5	3
	2041663-M3	M 3	0,5	56	10	10	3,5	2,7	6	3
	2041663-M3.5	M 3.5	0,6	56	12	12	4	3	6	3
	2041663-M4	M 4	0,7	63	13	13	4,5	3,4	6	3
	2041663-M5	M 5	0,8	70	16	16	6	4,9	8	3
	2041663-M6	M 6	1	80	15	23	6	4,9	8	3
	2041663-M8	M 8	1,25	90	18	29,5	8	6,2	9	3
	2041663-M10	M 10	1,5	100	20	33,5	10	8	11	3

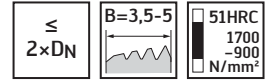
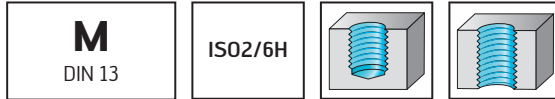
DIN 376										
	Designation	D_N	P	l_1	L_c	l_3	d_1	$\square$	l_g	N
	ACN									
	2046663-M12	M 12	1,75	110	23	83	9	7	10	4
	2046663-M16	M 16	2	110	25	68	12	9	12	4
	2046663-M20	M 20	2,5	140	30	95	16	12	15	4

HSS-E-PM machine taps

Paradur® FT



– For short-chipping materials

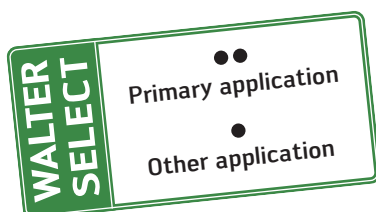


	P	M	K	N	S	H	O
Uncoated					●		●

~DIN 371										
	Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	20316-M3	M 3	0,5	56	11	35	3,5	2,7	6	3
	20316-M4	M 4	0,7	63	13	42	4,5	3,4	6	5
	20316-M5	M 5	0,8	70	16	47	6	4,9	8	5
	20316-M6	M 6	1	80	20	57	6	4,9	8	5
	20316-M8	M 8	1,25	90	25	66	8	6,2	9	5
	20316-M10	M 10	1,5	100	30	72	10	8	11	5

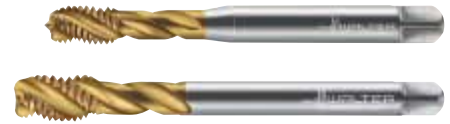
Without reduced neck after the thread

B5

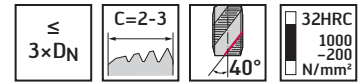
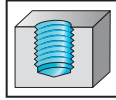


HSS-E machine taps

Paradur® Uni

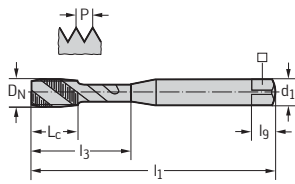


– For long-chipping materials



	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●
VAP	●	●	●	●	●	●	●
Uncoated	●	●	●	●	●	●	●

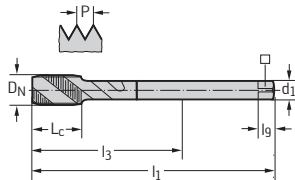
DIN 371



Designation TIN	Designation VAP	Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	N
		7051770-M2	M 2	0,4	45	4	9	2,8	2,1	3
		7051770-M2.3	M 2.3	0,4	45	4	12	2,8	2,1	3
		7051770-M2.5	M 2.5	0,45	50	4	12,5	2,8	2,1	3
		7051770-M2.6	M 2.6	0,45	50	4	12,5	2,8	2,1	3
7051775-M3	7051773-M3	7051770-M3	M 3	0,5	56	6	18	3,5	2,7	3
		7051770-M3.5	M 3.5	0,6	56	6,5	20	4	3	3
7051775-M4	7051773-M4	7051770-M4	M 4	0,7	63	7	21	4,5	3,4	3
7051775-M5	7051773-M5	7051770-M5	M 5	0,8	70	8	25	6	4,9	3
7051775-M6	7051773-M6	7051770-M6	M 6	1	80	10	30	6	4,9	3
7051775-M7		7051770-M7	M 7	1	80	10	30	7	5,5	3
7051775-M8	7051773-M8	7051770-M8	M 8	1,25	90	12	35	8	6,2	3
7051775-M10	7051773-M10	7051770-M10	M 10	1,5	100	15	39	10	8	3

l_g dimension in accordance with DIN 10

DIN 376



Designation TIN	Designation VAP	Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	N
		7056770-M3	M 3	0,5	56	6	34	2,2	1,8	3
		7056770-M4	M 4	0,7	63	7	43	2,8	2,1	3
		7056770-M5	M 5	0,8	70	8	49	3,5	2,7	3
		7056770-M6	M 6	1	80	10	59	4,5	3,4	3
		7056770-M8	M 8	1,25	90	12	67	6	4,9	3
		7056770-M10	M 10	1,5	100	15	77	7	5,5	3
7056775-M12	7056773-M12	7056770-M12	M 12	1,75	110	16	83	9	7	3
7056775-M14	7056773-M14	7056770-M14	M 14	2	110	20	81	11	9	3
7056775-M16	7056773-M16	7056770-M16	M 16	2	110	20	68	12	9	4
7056775-M18		7056770-M18	M 18	2,5	125	25	81	14	11	4
7056775-M20		7056770-M20	M 20	2,5	140	25	95	16	12	4
		7056770-M22	M 22	2,5	140	25	93	18	14,5	4
		7056770-M24	M 24	3	160	30	113	18	14,5	4
		7056770-M27	M 27	3	160	30	97	20	16	4
		7056770-M30	M 30	3,5	180	35	115	22	18	4
		7056770-M33	M 33	3,5	180	35	113	25	20	4
		7056770-M36	M 36	4	200	40	131	28	22	4

l_g dimension in accordance with DIN 10

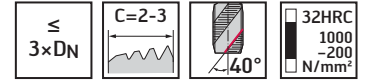


HSS-E machine taps

Paradur® Uni

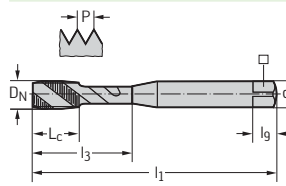


– For long-chipping materials



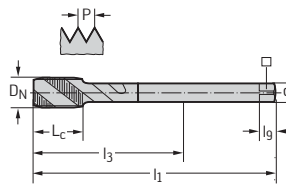
	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

DIN 371



Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
7053770-M2	M 2	0,4	45	4	9	2,8	2,1	5	3
7053770-M3	M 3	0,5	56	6	18	3,5	2,7	6	3
7053770-M4	M 4	0,7	63	7	21	4,5	3,4	6	3
7053770-M5	M 5	0,8	70	8	25	6	4,9	8	3
7053770-M6	M 6	1	80	10	30	6	4,9	8	3
7053770-M8	M 8	1,25	90	12	35	8	6,2	9	3
7053770-M10	M 10	1,5	100	15	39	10	8	11	3

DIN 376



Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
7058770-M12	M 12	1,75	110	16	83	9	7	10	3
7058770-M14	M 14	2	110	20	81	11	9	12	3
7058770-M16	M 16	2	110	20	68	12	9	12	4
7058770-M18	M 18	2,5	125	25	81	14	11	14	4
7058770-M20	M 20	2,5	140	25	95	16	12	15	4

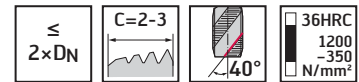


HSS-E-PM machine taps

Paradur® Sprint



– For long-chipping materials



	P	M	K	N	S	H	O
TICN	●	●	●	●	●	●	●
TIN	●	●	●	●	●	●	●

DIN 371	Designation TICN	Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
	7051366-M3	7051365-M3	M 3	0,5	56	6	18	3,5	2,7	6	3
	7051366-M4	7051365-M4	M 4	0,7	63	7	21	4,5	3,4	6	3
	7051366-M5	7051365-M5	M 5	0,8	70	8	25	6	4,9	8	3
	7051366-M6	7051365-M6	M 6	1	80	10	30	6	4,9	8	3
	7051366-M8	7051365-M8	M 8	1,25	90	12	35	8	6,2	9	3
	7051366-M10	7051365-M10	M 10	1,5	100	15	39	10	8	11	3

DIN 376	Designation TICN	Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
		7056365-M12	M 12	1,75	110	16	83	9	7	10	3
		7056365-M14	M 14	2	110	20	81	11	9	12	3
		7056365-M16	M 16	2	110	20	68	12	9	12	4
		7056365-M18	M 18	2,5	125	25	81	14	11	14	4
		7056365-M20	M 20	2,5	140	25	95	16	12	15	4

HSS-E-PM machine taps

Paradur® Megasprint

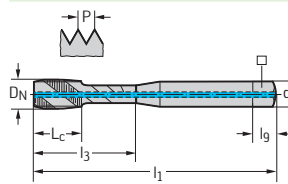


– For long-chipping materials



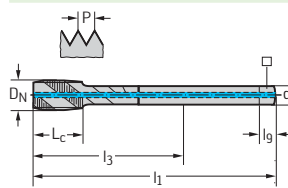
	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●

DIN 371

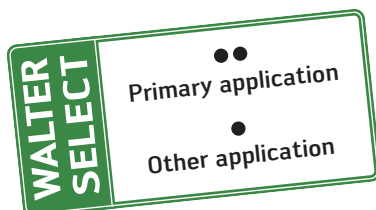


Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
7051315-M6	M 6	1	80	10	30	6	4,9	8	3
7051315-M8	M 8	1,25	90	12	35	8	6,2	9	3
7051315-M10	M 10	1,5	100	15	39	10	8	11	3

DIN 376



Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
7056315-M12	M 12	1,75	110	16	83	9	7	10	3
7056315-M14	M 14	2	110	20	81	11	9	12	3
7056315-M16	M 16	2	110	20	68	12	9	12	4
7056315-M18	M 18	2,5	125	25	81	14	11	14	4
7056315-M20	M 20	2,5	140	25	95	16	12	15	4

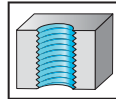


HSS-E-PM machine taps

Prototex® Eco Plus

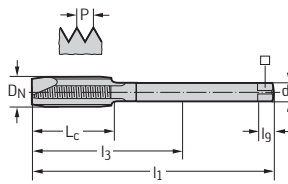


– For long-chipping materials



	P	M	K	N	S	H	O
THL	●	●	●	●			

DIN 374



Designation THL	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
EP2126302-M6X0.75	MF 6x0.75	0,75	80	15	59	4,5	3,4	6	3
EP2126302-M8X1	MF 8x1	1	90	18	67	6	4,9	8	3
EP2126302-M10X1	MF 10x1	1	90	20	67	7	5,5	8	3
EP2126302-M10X1.25	MF 10x1.25	1,25	100	20	77	7	5,5	8	3
EP2126302-M12X1	MF 12x1	1	100	21	73	9	7	10	4
EP2126302-M12X1.25	MF 12x1.25	1,25	100	21	73	9	7	10	4
EP2126302-M12X1.5	MF 12x1.5	1,5	100	21	73	9	7	10	4
EP2126302-M14X1.5	MF 14x1.5	1,5	100	21	71	11	9	12	4
EP2126302-M16X1.5	MF 16x1.5	1,5	100	21	58	12	9	12	4
EP2126302-M18X1.5	MF 18x1.5	1,5	110	24	66	14	11	14	4
EP2126302-M20X1.5	MF 20x1.5	1,5	125	24	80	16	12	15	4
EP2126302-M22X1.5	MF 22x1.5	1,5	125	24	78	18	14,5	17	4

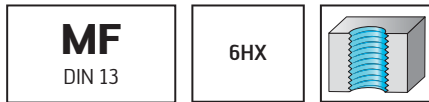
B5



HSS-E-PM machine taps Prototex® Eco Plus

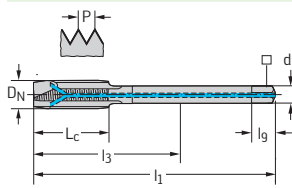


– For long-chipping materials

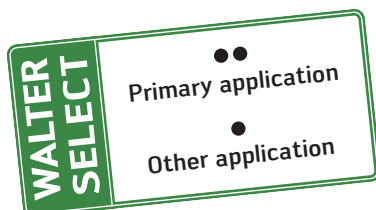


	P	M	K	N	S	H	O
THL	●	●	●	●			

DIN 374



Designation THL	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
EP2126342-M8X1	MF 8x1	1	90	18	67	6	4,9	5	3
EP2126342-M10X1	MF 10x1	1	90	20	67	7	5,5	8	3
EP2126342-M10X1.25	MF 10x1.25	1,25	100	20	77	7	5,5	8	3
EP2126342-M12X1	MF 12x1	1	100	21	73	9	7	10	4
EP2126342-M12X1.25	MF 12x1.25	1,25	100	21	73	9	7	10	4
EP2126342-M12X1.5	MF 12x1.5	1,5	100	21	73	9	7	10	4
EP2126342-M14X1.5	MF 14x1.5	1,5	100	21	71	11	9	12	4
EP2126342-M16X1.5	MF 16x1.5	1,5	100	21	58	12	9	12	4
EP2126342-M18X1.5	MF 18x1.5	1,5	110	24	66	14	11	14	4
EP2126342-M20X1.5	MF 20x1.5	1,5	125	24	80	16	12	12	4

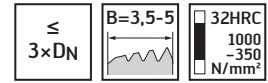


HSS-E machine taps

TC216 Perform

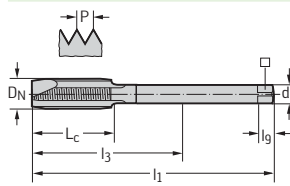


– For long-chipping materials



	P	M	K	N	S	H	O
WY80AA	●	●	●	●			
WY80FC	●	●	●	●			

DIN 374



Designation	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N	WY80AA	WY80FC
TC216-M8X1-L0-	MF 8x1	1	90	18	67	6	4,9	8	3	✱	✱
TC216-M10X1-L0-	MF 10x1	1	90	20	67	7	5,5	8	3	✱	✱
TC216-M12X1.25-L0-	MF 12x1.25	1,25	100	21	73	9	7	10	4	✱	✱
TC216-M12X1.5-L0-	MF 12x1.5	1,5	100	21	73	9	7	10	4	✱	✱
TC216-M14X1.5-L0-	MF 14x1.5	1,5	100	21	71	11	9	12	4	✱	✱
TC216-M16X1.5-L0-	MF 16x1.5	1,5	100	21	58	12	9	12	4	✱	✱
TC216-M18X1.5-L0-	MF 18x1.5	1,5	110	24	66	14	11	14	4	✱	✱

Ordering example for the WY80FC grade: TC216-M8X1-L0-WY80FC

B5

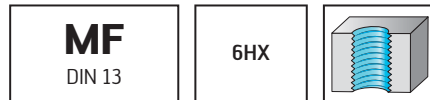


HSS-E machine taps

Prototex® Synchrospeed



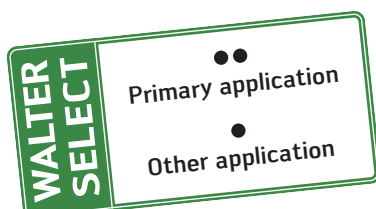
- For long-chipping materials
- Only for synchronous machining (rigid tapping)



	P	M	K	N	S	H	O
THL	●	●	●	●	●		●
TIN	●	●	●	●	●		●

~DIN 371	Designation		D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	□ mm	l _g mm	N
	THL	TIN									
	S2126302-M8X1	S2126305-M8X1	MF 8x1	1	90	10	35	8	6,2	9	3
	S2126302-M10X1	S2126305-M10X1	MF 10x1	1	90	10	39	10	8	11	3
	S2126302-M10X1.25	S2126305-M10X1.25	MF 10x1.25	1,25	100	13	39	10	8	11	3
	S2126302-M12X1.25	S2126305-M12X1.25	MF 12x1.25	1,25	100	13	42	12	9	12	3
	S2126302-M12X1.5	S2126305-M12X1.5	MF 12x1.5	1,5	100	15	42	12	9	12	3
	S2126302-M14X1.5	S2126305-M14X1.5	MF 14x1.5	1,5	100	15	49	14	11	14	3
	S2126302-M16X1.5	S2126305-M16X1.5	MF 16x1.5	1,5	100	15	50	16	12	15	4

B5

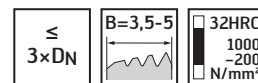
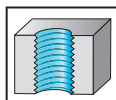


HSS-E machine taps

Prototex® X-pert P

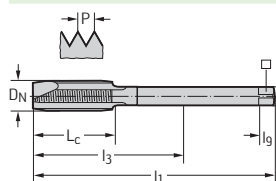


– For long-chipping materials



	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●
Uncoated	●	●	●	●	●	●	●

DIN 374



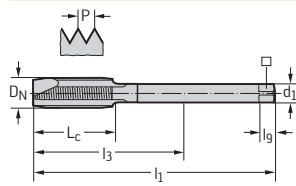
Designation TIN	Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
P2136005-M5X0.5	P21360-M5X0.5	MF 4x0.5	0,5	63	12	43	2,8	2,1	5	3
P2136005-M6X0.5	P21360-M6X0.5	MF 5x0.5	0,5	70	13	49	3,5	2,7	6	3
P2136005-M6X0.75	P21360-M6X0.75	MF 6x0.5	0,5	80	15	59	4,5	3,4	6	3
P2136005-M8X0.5	P21360-M8X0.5	MF 6x0.75	0,75	80	15	59	4,5	3,4	6	3
P2136005-M8X0.75	P21360-M8X0.75	MF 8x0.5	0,5	80	15	57	6	4,9	8	3
P2136005-M8X1	P21360-M8X1	MF 8x0.75	0,75	80	15	57	6	4,9	8	3
	P21360-M9X1	MF 8x1	1	90	18	67	6	4,9	8	3
	P21360-M10X0.5	MF 9x1	1	90	18	67	7	5,5	8	3
	P21360-M10X0.75	MF 10x0.5	0,5	90	20	67	7	5,5	8	3
	P21360-M10X1	MF 10x0.75	0,75	90	20	67	7	5,5	8	3
P2136005-M10X1	P21360-M10X1	MF 10x1	1	90	20	67	7	5,5	8	3
P2136005-M10X1.25	P21360-M10X1.25	MF 10x1.25	1,25	100	20	77	7	5,5	8	3
	P21360-M12X0.5	MF 12x0.5	0,5	100	21	73	9	7	10	4
P2136005-M12X1	P21360-M12X1	MF 12x1	1	100	21	73	9	7	10	4
	P21360-M12X1.25	MF 12x1.25	1,25	100	21	73	9	7	10	4
P2136005-M12X1.5	P21360-M12X1.5	MF 12x1.5	1,5	100	21	73	9	7	10	4
	P21360-M14X1	MF 14x1	1	100	21	71	11	9	12	4
	P21360-M14X1.25	MF 14x1.25	1,25	100	21	71	11	9	12	4
P2136005-M14X1.5	P21360-M14X1.5	MF 14x1.5	1,5	100	21	71	11	9	12	4
	P21360-M16X1	MF 16x1	1	100	21	58	12	9	12	4
P2136005-M16X1.5	P21360-M16X1.5	MF 16x1.5	1,5	100	21	58	12	9	12	4
	P21360-M18X1	MF 18x1	1	110	24	66	14	11	14	4
P2136005-M18X1.5	P21360-M18X1.5	MF 18x1.5	1,5	110	24	66	14	11	14	4
	P21360-M18X2	MF 18x2	2	125	30	81	14	11	14	4
	P21360-M20X1	MF 20x1	1	125	24	80	16	12	15	4
P2136005-M20X1.5	P21360-M20X1.5	MF 20x1.5	1,5	125	24	80	16	12	15	4
	P21360-M20X2	MF 20x2	2	140	30	95	16	12	15	4
	P21360-M22X1	MF 22x1	1	125	24	78	18	14,5	17	4
P2136005-M22X1.5	P21360-M22X1.5	MF 22x1.5	1,5	125	24	78	18	14,5	17	4
	P21360-M22X2	MF 22x2	2	140	26	93	18	14,5	17	4
	P21360-M24X1	MF 24x1	1	140	26	93	18	14,5	17	4
P2136005-M24X1.5	P21360-M24X1.5	MF 24x1.5	1,5	140	26	93	18	14,5	17	4
P2136005-M24X2	P21360-M24X2	MF 24x2	2	140	26	93	18	14,5	17	4
	P21360-M25X1.5	MF 25x1.5	1,5	140	26	93	18	14,5	17	4
	P21360-M26X1.5	MF 26x1.5	1,5	140	26	93	18	14,5	17	4
	P21360-M27X1	MF 27x1	1	140	26	77	20	16	19	4
	P21360-M27X1.5	MF 27x1.5	1,5	140	26	77	20	16	19	4
P2136005-M27X2	P21360-M27X2	MF 27x2	2	140	26	77	20	16	19	4
	P21360-M28X1.5	MF 28x1.5	1,5	140	26	77	20	16	19	4
	P21360-M30X1	MF 30x1	1	150	26	85	22	18	21	4
P2136005-M30X1.5	P21360-M30X1.5	MF 30x1.5	1,5	150	26	85	22	18	21	4
P2136005-M30X2	P21360-M30X2	MF 30x2	2	150	26	85	22	18	21	4
	P21360-M32X1.5	MF 32x1.5	1,5	150	26	85	22	18	21	4
	P21360-M32X2	MF 32x2	2	150	26	85	22	18	21	4
	P21360-M33X1.5	MF 33x1.5	1,5	160	28	93	25	20	23	4
	P21360-M33X2	MF 33x2	2	160	28	93	25	20	23	4
	P21360-M35X1.5	MF 35x1.5	1,5	170	28	101	28	22	25	4
	P21360-M36X1.5	MF 36x1.5	1,5	170	28	101	28	22	25	4

Continued



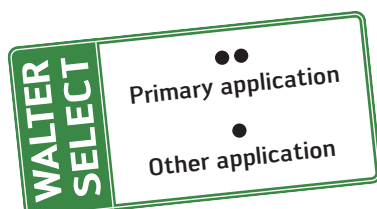
Continued

DIN 374



Designation TIN	Designation Uncoated	D_N	P mm	l_1 mm	L_C mm	l_3 mm	d_1 h9 mm	 mm	l_g mm	N
	P21360-M36X2	MF 36x2	2	170	28	101	28	22	25	4
	P21360-M36X3	MF 36x3	3	200	39	131	28	22	25	4
	P21360-M38X1.5	MF 38x1.5	1.5	170	28	101	28	22	25	5
	P21360-M39X2	MF 39x2	2	170	28	72	32	24	27	4
	P21360-M40X1.5	MF 40x1.5	1.5	170	28	72	32	24	27	5
	P21360-M40X2	MF 40x2	2	170	28	72	32	24	27	4
	P21360-M42X1.5	MF 42x1.5	1.5	170	28	72	32	24	27	5
	P21360-M42X2	MF 42x2	2	170	28	72	32	24	27	4
	P21360-M42X3	MF 42x3	3	200	42	102	32	24	27	4
	P21360-M45X1.5	MF 45x1.5	1.5	180	28	77	36	29	32	5
	P21360-M48X1.5	MF 48x1.5	1.5	190	28	87	36	29	32	5
	P21360-M48X3	MF 48x3	3	225	45	122	36	29	32	4
	P21360-M50X1.5	MF 50x1.5	1.5	190	28	87	36	29	32	5

B5

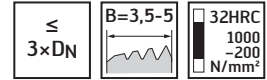


HSS-E machine taps

Prototex® X-pert P

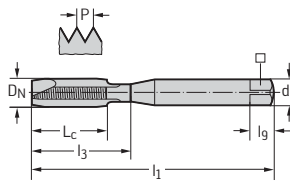


- Reduced number of flutes
- For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●●			●			●

DIN 371



Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
P21210-M2X0.25	MF 2x0.25	0,25	45	6	9	2,8	2,1	5	2
P21210-M2.2X0.25	MF 2.2x0.25	0,25	45	7	12	2,8	2,1	5	2
P21210-M2.3X0.25	MF 2.3x0.25	0,25	45	7	12	2,8	2,1	5	2
P21210-M3X0.25	MF 3x0.25	0,25	56	6	18	3,5	2,7	6	2
P21210-M2.5X0.35	MF 2.5x0.35	0,35	50	8	12,5	2,8	2,1	5	2
P21210-M3X0.35	MF 3x0.35	0,35	56	9	18	3,5	2,7	6	2
P21210-M3.5X0.35	MF 3.5x0.35	0,35	56	11	20	4	3	6	2
P21210-M4X0.35	MF 4x0.35	0,35	63	12	21	4,5	3,4	6	2
P21210-M4X0.5	MF 4x0.5	0,5	63	12	21	4,5	3,4	6	2
P21210-M4.5X0.5	MF 4.5x0.5	0,5	70	13	25	6	4,9	8	2
P21210-M5X0.5	MF 5x0.5	0,5	70	13	25	6	4,9	8	3
P21210-M5X0.75	MF 5x0.75	0,75	70	13	25	6	4,9	8	3
P21210-M6X0.5	MF 6x0.5	0,5	80	15	30	6	4,9	8	3
P21210-M6X0.75	MF 6x0.75	0,75	80	15	30	6	4,9	8	3
P21210-M7X0.75	MF 7x0.75	0,75	80	15	30	7	5,5	8	3
P21210-M8X1	MF 8x1	1	90	18	35	8	6,2	9	3
P21210-M10X1	MF 10x1	1	90	20	39	10	8	11	3

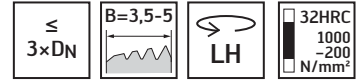
B5



HSS-E machine taps Prototex® X-pert P

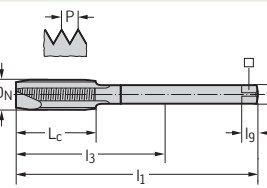


– For long-chipping materials



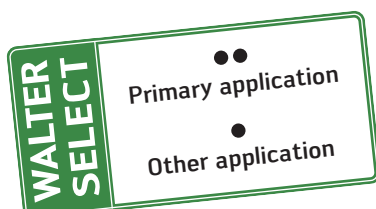
	P	M	K	N	S	H	O
Uncoated	●●			●			●

DIN 374



Designation Uncoated	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	 mm	l_g mm	N
P212608-M8X1	MF 8x1 - LH	1	90	18	67	6	4,9	8	3
P212608-M10X1	MF 10x1 - LH	1	90	20	67	7	5,5	8	3
P212608-M12X1	MF 12x1 - LH	1	100	21	73	9	7	10	4
P212608-M12X1.5	MF 12x1.5 - LH	1,5	100	21	73	9	7	10	4
P212608-M14X1.5	MF 14x1.5 - LH	1,5	100	21	71	11	9	12	4
P212608-M16X1	MF 16x1 - LH	1	100	21	58	12	9	12	4
P212608-M16X1.5	MF 16x1.5 - LH	1,5	100	21	58	12	9	12	4
P212608-M18X1.5	MF 18x1.5 - LH	1,5	110	24	66	14	11	14	4
P212608-M20X1.5	MF 20x1.5 - LH	1,5	125	24	80	16	12	15	4

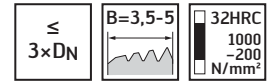
B5



HSS-E machine taps Prototex® X-pert P

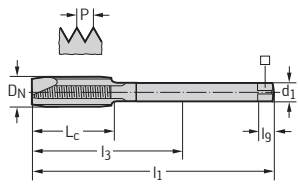


– For long-chipping materials



	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●
Uncoated	●	●	●	●	●	●	●

DIN 374



Designation TIN	Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
	P21380-M4X0.5	MF 4x0.5	0,5	63	12	43	2,8	2,1	5	3
	P21380-M5X0.5	MF 5x0.5	0,5	70	13	49	3,5	2,7	6	3
	P21380-M6X0.5	MF 6x0.5	0,5	80	15	59	4,5	3,4	6	3
	P21380-M6X0.75	MF 6x0.75	0,75	80	15	59	4,5	3,4	6	3
	P21380-M8X0.75	MF 8x0.75	0,75	80	15	57	6	4,9	8	3
P2138005-M8X1	P21380-M8X1	MF 8x1	1	90	18	67	6	4,9	8	3
P2138005-M10X1	P21380-M10X1	MF 10x1	1	90	20	67	7	5,5	8	3
	P21380-M10X1.25	MF 10x1.25	1,25	100	20	77	7	5,5	8	3
P2138005-M12X1	P21380-M12X1	MF 12x1	1	100	21	73	9	7	10	4
	P21380-M12X1.25	MF 12x1.25	1,25	100	21	73	9	7	10	4
P2138005-M12X1.5	P21380-M12X1.5	MF 12x1.5	1,5	100	21	73	9	7	10	4
P2138005-M14X1.5	P21380-M14X1.5	MF 14x1.5	1,5	100	21	71	11	9	12	4
P2138005-M16X1.5	P21380-M16X1.5	MF 16x1.5	1,5	100	21	58	12	9	12	4
	P21380-M18X1.5	MF 18x1.5	1,5	110	24	66	14	11	14	4
	P21380-M20X1.5	MF 20x1.5	1,5	125	24	80	16	12	15	4
	P21380-M22X1.5	MF 22x1.5	1,5	125	24	78	18	14,5	17	4
	P21380-M24X1.5	MF 24x1.5	1,5	140	26	93	18	14,5	17	4

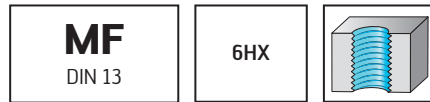
B5

HSS-E machine taps

Prototex® X-pert M



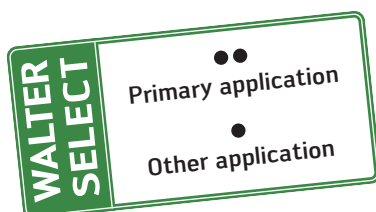
– For long-chipping materials



	P	M	K	N	S	H	O
TIN	●	●●	●●	●●	●●	●●	●●
VAP	●	●●	●●	●●	●●	●●	●●

DIN 371	Designation TIN	Designation VAP	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	M2121305-M5X0.5		MF 5x0.5	0,5	70	13	25	6	4,9	8	3
	M2121305-M6X0.5		MF 6x0.5	0,5	80	15	30	6	4,9	8	3
	M2121305-M6X0.75		MF 6x0.75	0,75	80	15	30	6	4,9	8	3

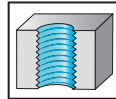
DIN 374	Designation TIN	Designation VAP	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	M2126305-M8X0.5	M21263-M8X0.5	MF 8x0.5	0,5	80	15	57	6	4,9	8	3
	M2126305-M8X0.75	M21263-M8X0.75	MF 8x0.75	0,75	80	15	57	6	4,9	8	3
	M2126305-M8X1	M21263-M8X1	MF 8x1	1	90	18	67	6	4,9	8	3
		M21263-M10X0.75	MF 10x0.75	0,75	90	20	67	7	5,5	8	3
	M2126305-M10X1	M21263-M10X1	MF 10x1	1	90	20	67	7	5,5	8	3
	M2126305-M10X1.25	M21263-M10X1.25	MF 10x1.25	1,25	100	20	77	7	5,5	8	3
		M21263-M12X1	MF 12x1	1	100	21	73	9	7	10	4
		M21263-M12X1.25	MF 12x1.25	1,25	100	21	73	9	7	10	4
	M2126305-M12X1.5	M21263-M12X1.5	MF 12x1.5	1,5	100	21	73	9	7	10	4
		M21263-M14X1	MF 14x1	1	100	21	71	11	9	12	4
	M2126305-M14X1.5	M21263-M14X1.5	MF 14x1.5	1,5	100	21	71	11	9	12	4
		M21263-M16X1	MF 16x1	1	100	21	58	12	9	12	4
	M2126305-M16X1.5	M21263-M16X1.5	MF 16x1.5	1,5	100	21	58	12	9	12	4
	M2126305-M18X1.5	M21263-M18X1.5	MF 18x1.5	1,5	110	24	66	14	11	14	4
	M2126305-M20X1.5	M21263-M20X1.5	MF 20x1.5	1,5	125	24	80	16	12	15	4
		M21263-M22X1.5	MF 22x1.5	1,5	125	24	78	18	14,5	17	4
		M21263-M24X1.5	MF 24x1.5	1,5	140	26	93	18	14,5	17	4



HSS-E machine taps Prototex® X-pert M

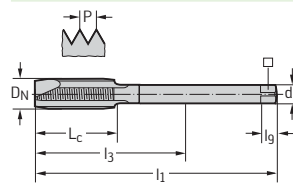


– For long-chipping materials



	P	M	K	N	S	H	O
TIN	●	●●					

DIN 374



Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
M2128305-M12X1.5	MF 12x1.5	1,5	100	21	73	9	7	10	4
M2128305-M14X1.5	MF 14x1.5	1,5	100	21	71	11	9	12	4
M2128305-M16X1.5	MF 16x1.5	1,5	100	21	58	12	9	12	4
M2128305-M20X1.5	MF 20x1.5	1,5	125	24	80	16	12	15	4
M2128305-M24X1.5	MF 24x1.5	1,5	140	26	93	18	14,5	17	4

B5

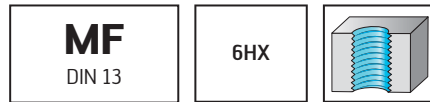


HSS-E-PM machine taps

Prototex® TiNi



– For long-chipping materials

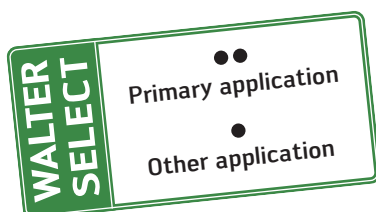


	P	M	K	N	S	H	O
Uncoated	●●	●●	●●	●●	●●	●●	●●

~DIN 371		Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
		212161-M8X0.75	MF 8x0.75	0,75	80	10	29	8	6,2	9	3
		212161-M8X1	MF 8x1	1	90	12	29	8	6,2	9	3
		212161-M10X1	MF 10x1	1	90	14	33	10	8	11	3

DIN 374		Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
		212661-M10X1.25	MF 10x1.25	1,25	100	20	77	7	5,5	8	3
		212661-M12X1	MF 12x1	1	100	16	73	9	7	10	4
		212661-M12X1.25	MF 12x1.25	1,25	100	21	73	9	7	10	4
		212661-M12X1.5	MF 12x1.5	1,5	100	21	73	9	7	10	4
		212661-M14X1	MF 14x1	1	100	16	71	11	9	12	4
		212661-M14X1.5	MF 14x1.5	1,5	100	21	71	11	9	12	4
		212661-M16X1	MF 16x1	1	100	18	58	12	9	12	4

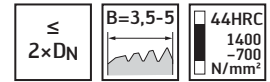
B5



HSS-E-PM machine taps Prototex® TiNi Plus



- Machining with emulsion is possible
- For long-chipping materials



ACN	P	M	K	N	S	H	O
					●●		

~DIN 371

Designation ACN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
2121763-M6X0.75	MF 6x0.75	0,75	80	15	23	6	4,9	8	3
2121763-M8X0.75	MF 8x0.75	0,75	90	18	29,5	8	6,2	9	3
2121763-M8X1	MF 8x1	1	90	18	29,5	8	6,2	9	3
2121763-M10X1	MF 10x1	1	100	20	33,5	10	8	11	3

DIN 374

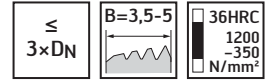
Designation	D_N	P	l_1	L_c	l_3	d_1 h9		l_9	N
ACN		mm	mm	mm	mm	mm	mm	mm	
2126763-M12X1	MF 12x1	1	100	21	73	9	7	10	4
2126763-M12X1.5	MF 12x1.5	1,5	100	21	73	9	7	10	4
2126763-M14X1.5	MF 14x1.5	1,5	100	21	71	11	9	12	4

HSS-E-PM machine taps

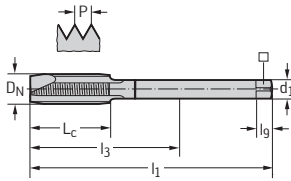
Prototex® Sprint



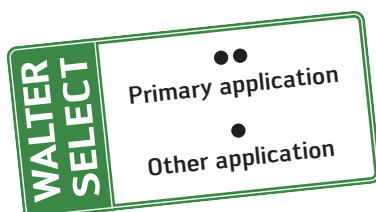
– For long-chipping materials



	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●

DIN 374										
	Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
	7126365-M8X1	MF 8x1	1	90	18	62	6	4,9	8	3
	7126365-M10X1	MF 10x1	1	90	20	62	7	5,5	8	3
	7126365-M12X1.25	MF 12x1.25	1,25	100	21	67	9	7	10	4
	7126365-M12X1.5	MF 12x1.5	1,5	100	21	66	9	7	10	4
	7126365-M14X1.5	MF 14x1.5	1,5	100	21	64	11	9	12	4
	7126365-M16X1.5	MF 16x1.5	1,5	100	21	51	12	9	12	4
	7126365-M18X1.5	MF 18x1.5	1,5	110	24	59	14	11	14	4
	7126365-M20X1.5	MF 20x1.5	1,5	125	24	73	16	12	15	4

B5

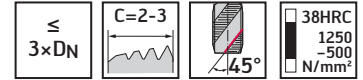
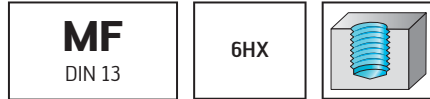


HSS-E-PM machine taps

Paradur® Eco Plus



– For long-chipping materials



	P	M	K	N	S	H	O
THL	●	●	●	●	●	●	●

DIN 374	Designation THL	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	EP2156302-M6x0.75	MF 6x0.75	0,75	80	10	59	4,5	3,4	6	3
	EP2156302-M8x1	MF 8x1	1	90	12	67	6	4,9	8	3
	EP2156302-M10x1	MF 10x1	1	90	12	67	7	5,5	8	3
	EP2156302-M10x1.25	MF 10x1.25	1,25	100	15	77	7	5,5	8	3
	EP2156302-M12x1	MF 12x1	1	100	13	73	9	7	10	4
	EP2156302-M12x1.25	MF 12x1.25	1,25	100	13	73	9	7	10	4
	EP2156302-M12x1.5	MF 12x1.5	1,5	100	13	73	9	7	10	4
	EP2156302-M14x1.25	MF 14x1.25	1,25	100	15	71	11	9	12	4
	EP2156302-M14x1.5	MF 14x1.5	1,5	100	15	71	11	9	12	4
	EP2156302-M16x1.5	MF 16x1.5	1,5	100	15	58	12	9	12	4
	EP2156302-M18x1.5	MF 18x1.5	1,5	110	17	66	14	11	14	4
	EP2156302-M20x1.5	MF 20x1.5	1,5	125	17	80	16	12	15	4
	EP2156302-M22x1.5	MF 22x1.5	1,5	125	18	78	18	14,5	17	4

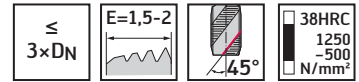
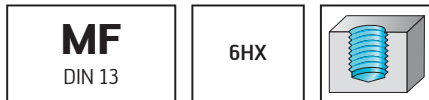
B5

HSS-E-PM machine taps

Paradur® Eco Plus

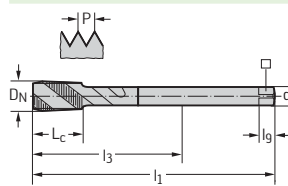


– For long-chipping materials

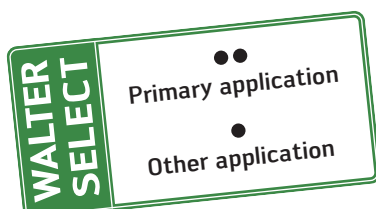


	P	M	K	N	S	H	O
THL	●	●	●	●			

DIN 374



Designation THL	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	$\square$ mm	l_g mm	N
EP2156362-M8X1	MF 8x1	1	90	12	67	6	4,9	8	4
EP2156362-M10X1	MF 10x1	1	90	12	67	7	5,5	8	4
EP2156362-M12X1.5	MF 12x1.5	1,5	100	13	73	9	7	10	4
EP2156362-M14X1.5	MF 14x1.5	1,5	100	15	71	11	9	12	4



HSS-E-PM machine taps

Paradur® Eco Plus

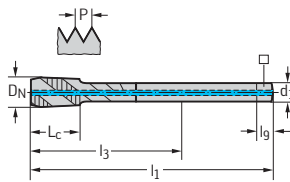


– For long-chipping materials



	P	M	K	N	S	H	O
THL	●	●	●	●	●	●	●

DIN 374										
Designation THL	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N	
EP2156312-M8X1	MF 8x1	1	90	12	67	6	4,9	8	3	
EP2156312-M10X1	MF 10x1	1	90	12	67	7	5,5	8	3	
EP2156312-M10X1.25	MF 10x1.25	1,25	100	15	77	7	5,5	8	3	
EP2156312-M12X1	MF 12x1	1	100	13	73	9	7	10	4	
EP2156312-M12X1.25	MF 12x1.25	1,25	100	13	73	9	7	10	4	
EP2156312-M12X1.5	MF 12x1.5	1,5	100	13	73	9	7	10	4	
EP2156312-M14X1.5	MF 14x1.5	1,5	100	15	71	11	9	12	4	
EP2156312-M16X1.5	MF 16x1.5	1,5	100	15	58	12	9	12	4	
EP2156312-M18X1.5	MF 18x1.5	1,5	110	17	66	14	11	14	4	
EP2156312-M20X1.5	MF 20x1.5	1,5	125	17	80	16	12	15	4	

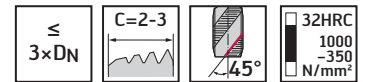
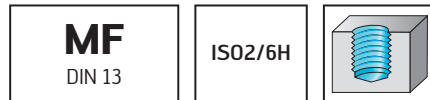


HSS-E machine taps

TC115 Perform



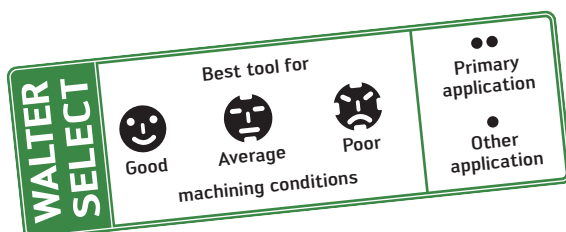
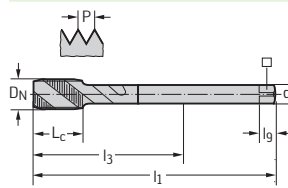
– For long-chipping materials



	P	M	K	N	S	H	O
WY80AA	●	●	●	●			
WY80FC	●	●	●	●			

DIN 374												WY80AA	WY80FC
Designation	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N				
TC115-M8X1-L0-	MF 8x1	1	90	12	67	6	4,9	8	3				
TC115-M10X1-L0-	MF 10x1	1	90	12	67	7	5,5	8	3				
TC115-M12X1.25-L0-	MF 12x1.25	1,25	100	13	73	9	7	10	4				
TC115-M12X1.5-L0-	MF 12x1.5	1,5	100	13	73	9	7	10	4				
TC115-M14X1.5-L0-	MF 14x1.5	1,5	100	15	71	11	9	12	4				
TC115-M16X1.5-L0-	MF 16x1.5	1,5	100	15	58	12	9	12	4				
TC115-M18X1.5-L0-	MF 18x1.5	1,5	110	17	66	14	11	14	4				

Ordering example for the WY80FC grade: TC115-M8X1-L0-WY80FC

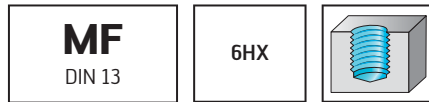
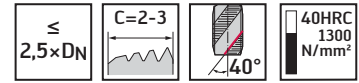


HSS-E machine taps

Paradur® Synchrospeed



- For long-chipping materials
- Only for synchronous machining (rigid tapping)



	P	M	K	N	S	H	O
THL	●	●	●	●	●	●	●
TIN/VAP	●	●	●	●	●	●	●

~DIN 371												
	Designation THL	Designation TIN/VAP	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	□ mm	l ₉ mm	N	
	S2156302-M8X1	S2156305-M8X1	MF 8x1	1	90	10,5	35	8	6,2	9	3	
	S2156302-M10X1	S2156305-M10X1	MF 10x1	1	90	10,5	39	10	8	11	3	
	S2156302-M10X1.25	S2156305-M10X1.25	MF 10x1.25	1,25	100	13,5	39	10	8	11	3	
	S2156302-M12X1.25	S2156305-M12X1.25	MF 12x1.25	1,25	100	13,5	42	12	9	12	3	
	S2156302-M12X1.5	S2156305-M12X1.5	MF 12x1.5	1,5	100	16	42	12	9	12	3	
	S2156302-M14X1.5	S2156305-M14X1.5	MF 14x1.5	1,5	100	16	49	14	11	14	4	
	S2156302-M16X1.5	S2156305-M16X1.5	MF 16x1.5	1,5	100	16	50	16	12	15	4	

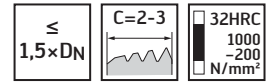
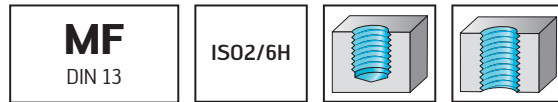
B5

HSS-E machine taps

Paradur® H



– For long-chipping and short-chipping materials



Uncoated	P	M	K	N	S	H	O
			●	●			●

DIN 371	Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
	21311-M2X0.25	MF 2x0.25	0,25	45	6	9	2,8	2,1	5	3
	21311-M2.2X0.25	MF 2.2x0.25	0,25	45	7	12	2,8	2,1	5	3
	21311-M2.5X0.35	MF 2.5x0.35	0,35	50	8	12,5	2,8	2,1	5	3
	21311-M3X0.35	MF 3x0.35	0,35	56	9	18	3,5	2,7	6	3
	21311-M3.5X0.35	MF 3.5x0.35	0,35	56	11	20	4	3	6	3
	21311-M4X0.35	MF 4x0.35	0,35	63	12	21	4,5	3,4	6	3
	21311-M4X0.5	MF 4x0.5	0,5	63	12	21	4,5	3,4	6	3
	21311-M5X0.35	MF 5x0.35	0,35	70	13	25	6	4,9	8	3
	21311-M5X0.5	MF 5x0.5	0,5	70	13	25	6	4,9	8	3
	21311-M6X0.75	MF 6x0.75	0,75	80	15	30	6	4,9	8	3
	21311-M7X0.75	MF 7x0.75	0,75	80	15	30	7	5,5	8	3

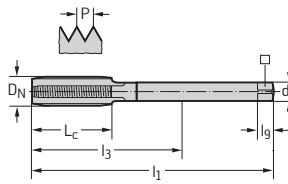
DIN 374	Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
	21361-M4X0.5	MF 4x0.5	0,5	63	12	43	2,8	2,1	5	3
	21361-M5X0.5	MF 5x0.5	0,5	70	13	49	3,5	2,7	6	3
	21361-M6X0.5	MF 6x0.5	0,5	80	15	59	4,5	3,4	6	3
	21361-M6X0.75	MF 6x0.75	0,75	80	15	59	4,5	3,4	6	3
	21361-M7X0.5	MF 7x0.5	0,5	80	15	58	5,5	4,3	7	3
	21361-M7X0.75	MF 7x0.75	0,75	80	15	58	5,5	4,3	7	3
	21361-M8X0.5	MF 8x0.5	0,5	80	15	57	6	4,9	8	3
	21361-M8X0.75	MF 8x0.75	0,75	80	15	57	6	4,9	8	3
	21361-M8X1	MF 8x1	1	90	18	67	6	4,9	8	3
	21361-M9X0.5	MF 9x0.5	0,5	90	15	67	7	5,5	8	3
	21361-M9X0.75	MF 9x0.75	0,75	90	15	67	7	5,5	8	3
	21361-M9X1	MF 9x1	1	90	18	67	7	5,5	8	3
	21361-M10X0.5	MF 10x0.5	0,5	90	20	67	7	5,5	8	3
	21361-M10X0.75	MF 10x0.75	0,75	90	20	67	7	5,5	8	3
	21361-M10X1	MF 10x1	1	90	20	67	7	5,5	8	3
	21361-M10X1.25	MF 10x1.25	1,25	100	20	77	7	5,5	8	3
	21361-M11X1	MF 11x1	1	90	20	66	8	6,2	9	3
	21361-M12X0.5	MF 12x0.5	0,5	100	21	73	9	7	10	3
	21361-M12X0.75	MF 12x0.75	0,75	100	21	73	9	7	10	4
	21361-M12X1	MF 12x1	1	100	21	73	9	7	10	4
	21361-M12X1.25	MF 12x1.25	1,25	100	21	73	9	7	10	4
	21361-M12X1.5	MF 12x1.5	1,5	100	21	73	9	7	10	4
	21361-M14X1	MF 14x1	1	100	21	71	11	9	12	4
	21361-M14X1.25	MF 14x1.25	1,25	100	21	71	11	9	12	4
	21361-M14X1.5	MF 14x1.5	1,5	100	21	71	11	9	12	4
	21361-M15X1.5	MF 15x1.5	1,5	100	21	58	12	9	12	4
	21361-M16X1	MF 16x1	1	100	21	58	12	9	12	4
	21361-M16X1.5	MF 16x1.5	1,5	100	21	58	12	9	12	4
	21361-M18X1	MF 18x1	1	110	24	66	14	11	14	4
	21361-M18X1.5	MF 18x1.5	1,5	110	24	66	14	11	14	4
	21361-M18X2	MF 18x2	2	125	30	81	14	11	14	4

Continued



Continued

DIN 374



Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
21361-M20X1	MF 20x1	1	125	24	80	16	12	15	4
21361-M20X1.5	MF 20x1.5	1,5	125	24	80	16	12	15	4
21361-M20X2	MF 20x2	2	140	30	95	16	12	15	4
21361-M22X1	MF 22x1	1	125	24	78	18	14,5	17	4
21361-M22X1.5	MF 22x1.5	1,5	125	24	78	18	14,5	17	4
21361-M22X2	MF 22x2	2	140	26	93	18	14,5	17	4
21361-M24X1	MF 24x1	1	140	26	93	18	14,5	17	4
21361-M24X1.5	MF 24x1.5	1,5	140	26	93	18	14,5	17	4
21361-M24X2	MF 24x2	2	140	26	93	18	14,5	17	4
21361-M25X1.5	MF 25x1.5	1,5	140	26	93	18	14,5	17	4
21361-M26X1.5	MF 26x1.5	1,5	140	26	93	18	14,5	17	4
21361-M27X1	MF 27x1	1	140	26	77	20	16	19	4
21361-M27X1.5	MF 27x1.5	1,5	140	26	77	20	16	19	4
21361-M27X2	MF 27x2	2	140	26	77	20	16	19	4
21361-M28X1.5	MF 28x1.5	1,5	140	26	77	20	16	19	4
21361-M28X2	MF 28x2	2	140	26	77	20	16	19	4
21361-M30X1	MF 30x1	1	150	26	85	22	18	21	4
21361-M30X1.5	MF 30x1.5	1,5	150	26	85	22	18	21	4
21361-M30X2	MF 30x2	2	150	26	85	22	18	21	4
21361-M32X1.5	MF 32x1.5	1,5	150	26	85	22	18	21	4
21361-M33X1.5	MF 33x1.5	1,5	160	28	93	25	20	23	4
21361-M33X2	MF 33x2	2	160	28	93	25	20	23	4
21361-M35X1.5	MF 35x1.5	1,5	170	28	101	28	22	25	4
21361-M36X1.5	MF 36x1.5	1,5	170	28	101	28	22	25	4
21361-M36X2	MF 36x2	2	170	28	101	28	22	25	4
21361-M36X3	MF 36x3	3	200	39	131	28	22	25	4
21361-M38X1.5	MF 38x1.5	1,5	170	28	101	28	22	25	6
21361-M39X1.5	MF 39x1.5	1,5	170	28	72	32	24	27	6
21361-M39X3	MF 39x3	3	200	42	102	32	24	27	4
21361-M40X1.5	MF 40x1.5	1,5	170	28	72	32	24	27	6
21361-M40X2	MF 40x2	2	170	28	72	32	24	27	4
21361-M42X1.5	MF 42x1.5	1,5	170	28	72	32	24	27	6
21361-M42X2	MF 42x2	2	170	28	72	32	24	27	4
21361-M42X3	MF 42x3	3	200	42	102	32	24	27	4
21361-M45X1.5	MF 45x1.5	1,5	180	28	77	36	29	32	6
21361-M45X2	MF 45x2	2	180	30	77	36	29	32	6
21361-M45X3	MF 45x3	3	200	42	97	36	29	32	4
21361-M48X1.5	MF 48x1.5	1,5	190	28	87	36	29	32	6
21361-M48X2	MF 48x2	2	190	30	87	36	29	32	6
21361-M48X3	MF 48x3	3	225	45	122	36	29	32	4
21361-M50X1.5	MF 50x1.5	1,5	190	28	87	36	29	32	6
21361-M52X1.5	MF 52x1.5	1,5	190	29	60	40	32	35	6
21361-M52X2	MF 52x2	2	190	32	60	40	32	35	6
21361-M52X3	MF 52x3	3	225	45	95	40	32	35	6

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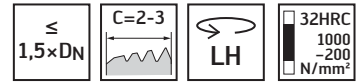
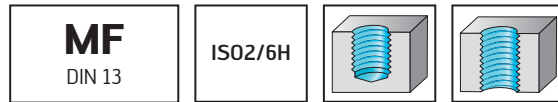


HSS-E machine taps

Paradur® H



– For long-chipping and short-chipping materials

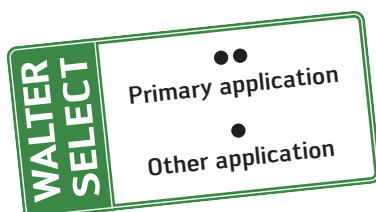


	P	M	K	N	S	H	O
Uncoated			●	●			●

DIN 374

Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h ₉ mm	 mm	l ₉ mm	N
21368-M4X0.5	MF 4x0.5 - LH	0,5	63	12	43	2,8	2,1	5	3
21368-M5X0.5	MF 5x0.5 - LH	0,5	70	13	49	3,5	2,7	6	3
21368-M6X0.5	MF 6x0.5 - LH	0,5	80	15	59	4,5	3,4	6	3
21368-M6X0.75	MF 6x0.75 - LH	0,75	80	15	59	4,5	3,4	6	3
21368-M8X0.5	MF 8x0.5 - LH	0,5	80	15	57	6	4,9	8	3
21368-M8X0.75	MF 8x0.75 - LH	0,75	80	15	57	6	4,9	8	3
21368-M8X1	MF 8x1 - LH	1	90	18	67	6	4,9	8	3
21368-M10X0.75	MF 10x0.75 - LH	0,75	90	20	67	7	5,5	8	3
21368-M10X1	MF 10x1 - LH	1	90	20	67	7	5,5	8	3
21368-M12X1	MF 12x1 - LH	1	100	21	73	9	7	10	4
21368-M12X1.5	MF 12x1.5 - LH	1,5	100	21	73	9	7	10	4
21368-M14X1	MF 14x1 - LH	1	100	21	71	11	9	12	4
21368-M14X1.5	MF 14x1.5 - LH	1,5	100	21	71	11	9	12	4
21368-M16X1	MF 16x1 - LH	1	100	21	58	12	9	12	4
21368-M16X1.5	MF 16x1.5 - LH	1,5	100	21	58	12	9	12	4
21368-M18X1.5	MF 18x1.5 - LH	1,5	110	24	66	14	11	14	4
21368-M20X1.5	MF 20x1.5 - LH	1,5	125	24	80	16	12	15	4
21368-M22X1.5	MF 22x1.5 - LH	1,5	125	24	78	18	14,5	17	4
21368-M24X1.5	MF 24x1.5 - LH	1,5	140	26	93	18	14,5	17	4

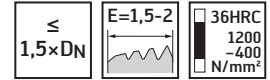
B5



HSS-E machine taps Paradur® HN



– For short-chipping materials



	P	M	K	N	S	H	O
Uncoated	●●		●●	●●			

DIN 374

Designation	D_N	P	l_1	L_c	l_3	d_1		l_9	N
Uncoated		mm	mm	mm	mm	h9 mm	mm	mm	
213614-M12X1.5	MF 12x1.5	1,5	100	21	73	9	7	10	5
213614-M14X1.5	MF 14x1.5	1,5	100	21	71	11	9	12	6
213614-M16X1.5	MF 16x1.5	1,5	100	21	58	12	9	12	6
213614-M18X1.5	MF 18x1.5	1,5	110	24	66	14	11	14	6
213614-M20X1.5	MF 20x1.5	1,5	125	24	80	16	12	15	6
213614-M22X1.5	MF 22x1.5	1,5	125	24	78	18	14,5	17	6

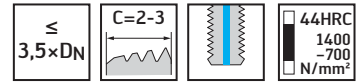
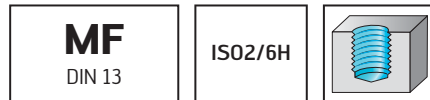
B5

HSS-E machine taps

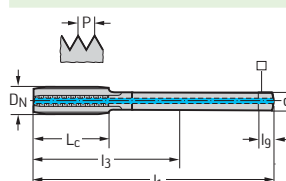
Paradur® HT



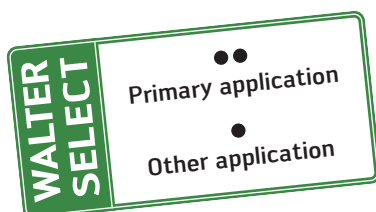
– For long-chipping and short-chipping materials



	P	M	K	N	S	H	O
TIN	●●		●●	●			●

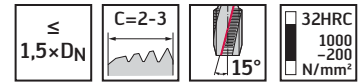
DIN 374										
	Designation	D_N	P	l_1	L_c	l_3	d_1	l_9	N	
	TIN		mm	mm	mm	mm	h9 mm	mm	mm	
	2136115-M10X1	MF 10x1	1	90	20	67	7	5,5	8	3
	2136115-M12X1.5	MF 12x1.5	1,5	100	21	73	9	7	10	3
	2136115-M14X1.5	MF 14x1.5	1,5	100	21	71	11	9	12	3
	2136115-M16X1.5	MF 16x1.5	1,5	100	21	58	12	9	12	3
	2136115-M18X1.5	MF 18x1.5	1,5	110	24	66	14	11	14	3
	2136115-M20X1.5	MF 20x1.5	1,5	125	24	80	16	12	15	3
	2136115-M22X1.5	MF 22x1.5	1,5	125	24	78	18	14,5	17	3
	2136115-M24X1.5	MF 24x1.5	1,5	140	26	93	18	14,5	17	4
	2136115-M30X2	MF 30x2	2	150	26	85	22	18	21	4
	2136115-M33X2	MF 33x2	2	160	28	93	25	20	23	4

B5



HSS-E machine taps

Paradur® N

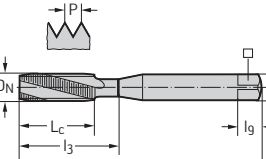


– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●
TICN	●	●	●	●	●	●	●
TIN	●	●	●	●	●	●	●

DIN 371



Designation TICN	Designation TIN	Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	 mm
		21410-M4X0.5	MF 4x0.5	0,5	63	7	21	4,5	3,4
		21410-M5X0.5	MF 5x0.5	0,5	70	8	25	6	4,9
		21410-M6X0.5	MF 6x0.5	0,5	80	10	30	6	4,9
		21410-M6X0.75	MF 6x0.75	0,75	80	10	30	6	4,9

lg dimension in accordance with DIN 10

DIN 374

Designation TICN	Designation TIN	Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	
	2146005-M8X0.75	21460-M8X0.75	MF 8x0.75	0,75	80	10	57	6	4,9
2146006-M8X1	2146005-M8X1	21460-M8X1	MF 8x1	1	90	13	67	6	4,9
2146006-M10X1	2146005-M10X1	21460-M10X1	MF 10x1	1	90	12	67	7	5,5
		21460-M10X1.25	MF 10x1.25	1,25	100	15	77	7	5,5
2146006-M12X1	2146005-M12X1	21460-M12X1	MF 12x1	1	100	13	73	9	7
		21460-M12X1.25	MF 12x1.25	1,25	100	13	73	9	7
2146006-M12X1.5	2146005-M12X1.5	21460-M12X1.5	MF 12x1.5	1,5	100	21	73	9	7
		21460-M14X1	MF 14x1	1	100	15	71	11	9
		21460-M14X1.25	MF 14x1.25	1,25	100	15	71	11	9
2146006-M14X1.5	2146005-M14X1.5	21460-M14X1.5	MF 14x1.5	1,5	100	21	71	11	9
		21460-M16X1	MF 16x1	1	100	15	58	12	9
2146006-M16X1.5	2146005-M16X1.5	21460-M16X1.5	MF 16x1.5	1,5	100	21	58	12	9
2146006-M18X1.5	2146005-M18X1.5	21460-M18X1.5	MF 18x1.5	1,5	110	24	66	14	11
2146006-M20X1.5	2146005-M20X1.5	21460-M20X1.5	MF 20x1.5	1,5	125	24	80	16	12
		21460-M20X2	MF 20x2	2	140	30	95	16	12
	2146005-M22X1.5	21460-M22X1.5	MF 22x1.5	1,5	125	24	78	18	14,5
	2146005-M24X1.5	21460-M24X1.5	MF 24x1.5	1,5	140	26	93	18	14,5
		21460-M24X2	MF 24x2	2	140	26	93	18	14,5
		21460-M26X1.5	MF 26x1.5	1,5	140	26	93	18	14,5
		21460-M27X1.5	MF 27x1.5	1,5	140	26	77	20	16
		21460-M27X2	MF 27x2	2	140	26	77	20	16
		21460-M28X1.5	MF 28x1.5	1,5	140	26	77	20	16
		21460-M30X1.5	MF 30x1.5	1,5	150	26	85	22	18
		21460-M30X2	MF 30x2	2	150	26	85	22	18
		21460-M32X1.5	MF 32x1.5	1,5	150	26	85	22	18
		21460-M33X1.5	MF 33x1.5	1,5	160	28	93	25	20
		21460-M36X1.5	MF 36x1.5	1,5	170	28	101	28	22

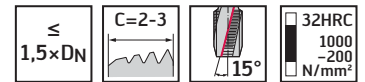
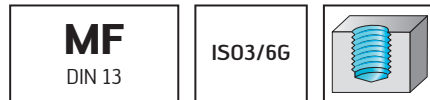
lg dimension in accordance with DIN 10

HSS-E machine taps

Paradur® N



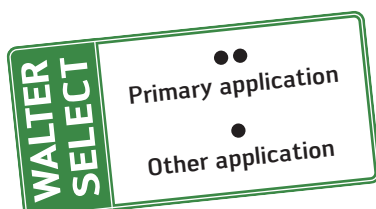
– For long-chipping materials



	P	M	K	N	S	H	O
TIN	●●		●●	●●			
Uncoated	●●		●●	●●			

DIN 374												
	Designation TIN	Designation Uncoated	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	$\square$ mm	l_g mm	N	
		21480-M4X0.5	MF 4x0.5	0,5	63	7	43	2,8	2,1	5	3	
		21480-M5X0.5	MF 5x0.5	0,5	70	8	49	3,5	2,7	6	3	
		21480-M6X0.5	MF 6x0.5	0,5	80	10	59	4,5	3,4	6	3	
		21480-M6X0.75	MF 6x0.75	0,75	80	10	59	4,5	3,4	6	3	
		21480-M8X0.75	MF 8x0.75	0,75	80	10	57	6	4,9	8	3	
	2148005-M8X1	21480-M8X1	MF 8x1	1	90	13	67	6	4,9	8	3	
	2148005-M10X1	21480-M10X1	MF 10x1	1	90	12	67	7	5,5	8	3	
	2148005-M12X1	21480-M12X1	MF 12x1	1	100	13	73	9	7	10	3	
	2148005-M12X1.5	21480-M12X1.5	MF 12x1.5	1,5	100	21	73	9	7	10	3	
	2148005-M14X1.5	21480-M14X1.5	MF 14x1.5	1,5	100	21	71	11	9	12	4	
	2148005-M16X1.5	21480-M16X1.5	MF 16x1.5	1,5	100	21	58	12	9	12	4	
		21480-M18X1.5	MF 18x1.5	1,5	110	24	66	14	11	14	4	
		21480-M20X1.5	MF 20x1.5	1,5	125	24	80	16	12	15	4	
		21480-M22X1.5	MF 22x1.5	1,5	125	24	78	18	14,5	17	4	

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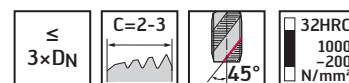
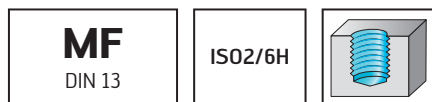


HSS-E machine taps

Paradur® X-pert P

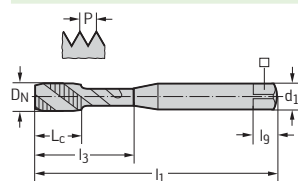


– For long-chipping materials



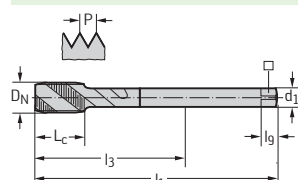
	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●
TIN	●	●	●	●	●	●	●

DIN 371



Designation TIN	Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
	P21519-M2.5X0.35	MF 2.5x0.35	0,35	50	4	12,5	2,8	2,1	5	3
	P21519-M3X0.25	MF 3x0.25	0,25	56	6	18	3,5	2,7	6	3
	P21519-M3X0.35	MF 3x0.35	0,35	56	6	18	3,5	2,7	6	3
	P21519-M4X0.35	MF 4x0.35	0,35	63	7	21	4,5	3,4	6	3
	P21519-M4X0.5	MF 4x0.5	0,5	63	7	21	4,5	3,4	6	3
	P21519-M4.5X0.5	MF 4.5x0.5	0,5	70	8	25	6	4,9	8	3
	P21519-M5X0.5	MF 5x0.5	0,5	70	8	25	6	4,9	8	3
	P21519-M6X0.5	MF 6x0.5	0,5	80	10	30	6	4,9	8	3
	P21519-M6X0.75	MF 6x0.75	0,75	80	10	30	6	4,9	8	3
	P21519-M7X0.75	MF 7x0.75	0,75	80	10	30	7	5,5	8	3
	P21519-M8X1	MF 8x1	1	90	12	35	8	6,2	9	3
	P21519-M10X1	MF 10x1	1	90	12	39	10	8	11	3

DIN 374



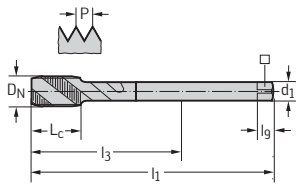
Designation TIN	Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
	P21569-M8X0.75	MF 8x0.75	0,75	80	10	57	6	4,9	8	3
P2156905-M8X1	P21569-M8X1	MF 8x1	1	90	12	67	6	4,9	8	3
	P21569-M9X1	MF 9x1	1	90	13	67	7	5,5	8	3
	P21569-M10X0.75	MF 10x0.75	0,75	90	12	67	7	5,5	8	3
P2156905-M10X1	P21569-M10X1	MF 10x1	1	90	12	67	7	5,5	8	3
P2156905-M10X1.25	P21569-M10X1.25	MF 10x1.25	1,25	100	15	77	7	5,5	8	3
P2156905-M12X1	P21569-M12X1	MF 12x1	1	100	13	73	9	7	10	4
P2156905-M12X1.25	P21569-M12X1.25	MF 12x1.25	1,25	100	13	73	9	7	10	4
P2156905-M12X1.5	P21569-M12X1.5	MF 12x1.5	1,5	100	13	73	9	7	10	4
	P21569-M14X1	MF 14x1	1	100	15	71	11	9	12	4
	P21569-M14X1.25	MF 14x1.25	1,25	100	15	71	11	9	12	4
P2156905-M14X1.5	P21569-M14X1.5	MF 14x1.5	1,5	100	15	71	11	9	12	4
	P21569-M16X1	MF 16x1	1	100	15	58	12	9	12	4
P2156905-M16X1.5	P21569-M16X1.5	MF 16x1.5	1,5	100	15	58	12	9	12	4
	P21569-M18X1	MF 18x1	1	110	17	66	14	11	14	4
P2156905-M18X1.5	P21569-M18X1.5	MF 18x1.5	1,5	110	17	66	14	11	14	4
	P21569-M20X1	MF 20x1	1	125	17	80	16	12	15	4
P2156905-M20X1.5	P21569-M20X1.5	MF 20x1.5	1,5	125	17	80	16	12	15	4
	P21569-M20X2	MF 20x2	2	140	25	95	16	12	15	4
	P21569-M22X1	MF 22x1	1	125	18	78	18	14,5	17	4
P2156905-M22X1.5	P21569-M22X1.5	MF 22x1.5	1,5	125	18	78	18	14,5	17	4
	P21569-M22X2	MF 22x2	2	140	20	93	18	14,5	17	4
	P21569-M24X1	MF 24x1	1	140	20	93	18	14,5	17	5
	P21569-M24X1.5	MF 24x1.5	1,5	140	20	93	18	14,5	17	5
	P21569-M24X2	MF 24x2	2	140	20	93	18	14,5	17	5
	P21569-M26X1.5	MF 26x1.5	1,5	140	20	93	18	14,5	17	5
	P21569-M27X1.5	MF 27x1.5	1,5	140	20	77	20	16	19	5
	P21569-M27X2	MF 27x2	2	140	20	77	20	16	19	5
	P21569-M30X1.5	MF 30x1.5	1,5	150	20	85	22	18	21	5
	P21569-M30X2	MF 30x2	2	150	20	85	22	18	21	5

Continued



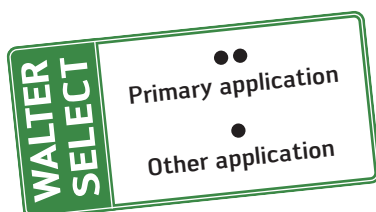
Continued

DIN 374



Designation TIN	Designation Uncoated	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	l_9 mm	N
	P21569-M32X1.5	MF 32x1.5	1,5	150	20	85	22	18	5
	P21569-M33X1.5	MF 33x1.5	1,5	160	22	93	25	20	5
	P21569-M33X2	MF 33x2	2	160	22	93	25	20	5
	P21569-M36X1.5	MF 36x1.5	1,5	170	22	101	28	22	5
	P21569-M36X2	MF 36x2	2	170	22	101	28	22	5
	P21569-M36X3	MF 36x3	3	200	30	131	28	22	5
	P21569-M38X1.5	MF 38x1.5	1,5	170	22	101	28	22	5
	P21569-M39X2	MF 39x2	2	170	22	72	32	24	5
	P21569-M39X3	MF 39x3	3	200	33	102	32	24	5
	P21569-M40X1.5	MF 40x1.5	1,5	170	22	72	32	24	5
	P21569-M42X1.5	MF 42x1.5	1,5	170	22	72	32	24	6
	P21569-M42X2	MF 42x2	2	170	22	72	32	24	6
	P21569-M42X3	MF 42x3	3	200	33	102	32	24	6
	P21569-M45X1.5	MF 45x1.5	1,5	180	22	77	36	29	6
	P21569-M48X1.5	MF 48x1.5	1,5	190	22	87	36	29	6
	P21569-M48X2	MF 48x2	2	190	24	87	36	29	6
	P21569-M48X3	MF 48x3	3	225	36	122	36	29	6
	P21569-M52X2	MF 52x2	2	190	26	60	40	32	6
	P21569-M52X3	MF 52x3	3	225	36	95	40	32	6

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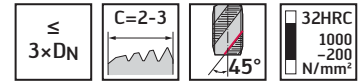
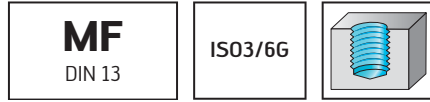


HSS-E machine taps

Paradur® X-pert P



– For long-chipping materials



	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●
Uncoated	●	●	●	●	●	●	●

DIN 374												
	Designation TIN	Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N	
	P2158905-M8X1	P21589-M8X1	MF 8x1	1	90	12	67	6	4,9	8	3	
	P2158905-M10X1	P21589-M10X1	MF 10x1	1	90	12	67	7	5,5	8	3	
	P2158905-M12X1	P21589-M12X1	MF 12x1	1	100	13	73	9	7	10	4	
	P2158905-M12X1.5	P21589-M12X1.5	MF 12x1.5	1,5	100	13	73	9	7	10	4	
	P2158905-M14X1.5	P21589-M14X1.5	MF 14x1.5	1,5	100	15	71	11	9	12	4	
	P2158905-M16X1.5	P21589-M16X1.5	MF 16x1.5	1,5	100	15	58	12	9	12	4	
	P2158905-M18X1.5	P21589-M18X1.5	MF 18x1.5	1,5	110	17	66	14	11	14	4	
		P21589-M20X1.5	MF 20x1.5	1,5	125	17	80	16	12	15	4	

B5

HSS-E machine taps
Paradur® Short Chip HT

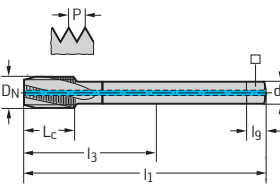


– For long-chipping materials



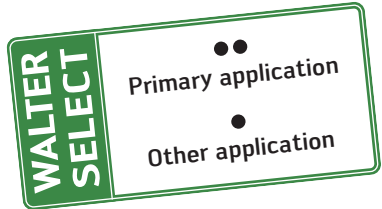
	P	M	K	N	S	H	O
THL	●	●	●	●	●	●	●
THL/uncoated	●	●	●	●	●	●	●

DIN 376



Designation THL	Designation THL / Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
21460T2-M12X1.5	21460TR-M12X1.5	MF 12x1.5	1,5	100	13	58	9	7	10	3
21460T2-M14X1.5	21460TR-M14X1.5	MF 14x1.5	1,5	100	15	71	11	9	12	4
21460T2-M16X1.5	21460TR-M16X1.5	MF 16x1.5	1,5	100	15	58	12	9	12	4

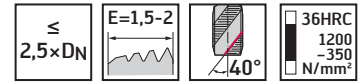
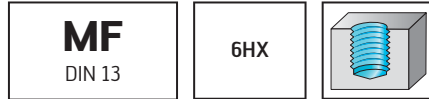
21460TR: Uncoated rake



HSS-E machine taps Paradur® STE



– For long-chipping materials



	P	M	K	N	S	H	O
THL	●	●	●	●	●	●	●

DIN 374										
	Designation	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	□ mm	l_9 mm	N
	THL									
	2156062-M8X1	MF 8x1	1	90	13	67	6	4,9	8	4
	2156062-M10X1	MF 10x1	1	90	12	67	7	5,5	8	4
	2156062-M12X1.5	MF 12x1.5	1,5	100	13	73	9	7	10	4
	2156062-M14X1.5	MF 14x1.5	1,5	100	15	71	11	9	12	5
	2156062-M16X1.5	MF 16x1.5	1,5	100	15	58	12	9	12	5
	2156062-M18X1.5	MF 18x1.5	1,5	110	17	66	14	11	14	5

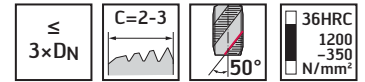
B5

HSS-E machine taps

TC142 Supreme

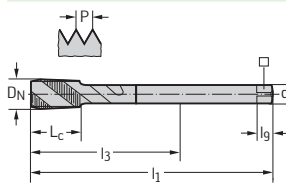


– For long-chipping materials



	P	M	K	N	S	H	O
WW60RB	●	●●					

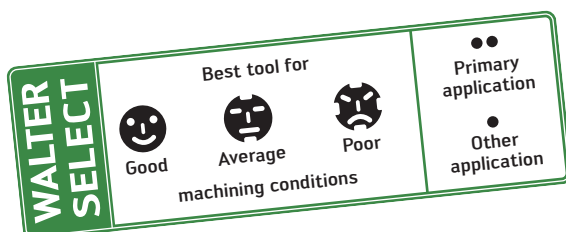
DIN 374



Designation	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N	WW60RB
TC142-M8X1-L0-	MF 8x1	1	90	12	67	6	4,9	8	3	
TC142-M10X1-L0-	MF 10x1	1	90	12	67	7	5,5	8	3	
TC142-M10X1.25-L0-	MF 10x1.25	1,25	100	15	77	7	5,5	8	3	
TC142-M12X1-L0-	MF 12x1	1	100	13	73	9	7	10	4	
TC142-M12X1.25-L0-	MF 12x1.25	1,25	100	13	73	9	7	10	4	
TC142-M12X1.5-L0-	MF 12x1.5	1,5	100	13	73	9	7	10	4	
TC142-M14X1.5-L0-	MF 14x1.5	1,5	100	15	71	11	9	12	4	
TC142-M16X1.5-L0-	MF 16x1.5	1,5	100	15	58	12	9	12	4	
TC142-M20X1.5-L0-	MF 20x1.5	1,5	125	17	80	16	12	15	4	

Ordering example for the WW60RB grade: TC142-M8X1-L0-WW60RB

B5

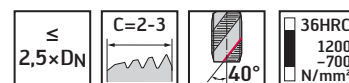
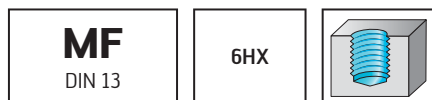


HSS-E machine taps

Paradur® X-pert M

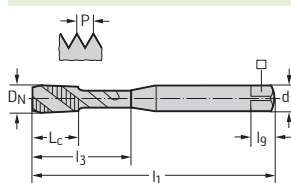


– For long-chipping materials



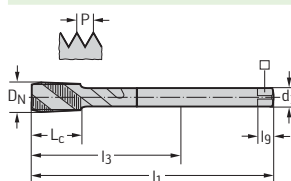
	P	M	K	N	S	H	O
TIN	●	●●	●	●	●	●	●
VAP	●	●●	●	●	●	●	●

DIN 371



Designation TIN	Designation VAP	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
M2151305-M4X0.5	M21513-M4X0.5	MF 4x0.5	0,5	63	7	21	4,5	3,4	6	3
M2151305-M5X0.5	M21513-M5X0.5	MF 5x0.5	0,5	70	8	25	6	4,9	8	3
M2151305-M6X0.5	M21513-M6X0.5	MF 6x0.5	0,5	80	10	30	6	4,9	8	3
	M21513-M6X0.75	MF 6x0.75	0,75	80	10	30	6	4,9	8	3

DIN 374



Designation TIN	Designation VAP	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
M2156305-M8X0.5	M21563-M8X0.5	MF 8x0.5	0,5	80	10	57	6	4,9	8	3
M2156305-M8X0.75	M21563-M8X0.75	MF 8x0.75	0,75	80	10	57	6	4,9	8	3
M2156305-M8X1	M21563-M8X1	MF 8x1	1	90	12	67	6	4,9	8	3
M2156305-M10X0.75	M21563-M10X0.75	MF 10x0.75	0,75	90	12	67	7	5,5	8	3
M2156305-M10X1	M21563-M10X1	MF 10x1	1	90	12	67	7	5,5	8	3
M2156305-M10X1.25	M21563-M10X1.25	MF 10x1.25	1,25	100	15	77	7	5,5	8	3
M2156305-M12X1	M21563-M12X1	MF 12x1	1	100	13	73	9	7	10	4
M2156305-M12X1.25	M21563-M12X1.25	MF 12x1.25	1,25	100	13	73	9	7	10	4
M2156305-M12X1.5	M21563-M12X1.5	MF 12x1.5	1,5	100	13	73	9	7	10	4
	M21563-M14X1	MF 14x1	1	100	15	71	11	9	12	4
M2156305-M14X1.5	M21563-M14X1.5	MF 14x1.5	1,5	100	15	71	11	9	12	4
M2156305-M16X1.5	M21563-M16X1.5	MF 16x1.5	1,5	100	15	58	12	9	12	4
M2156305-M18X1.5	M21563-M18X1.5	MF 18x1.5	1,5	110	17	66	14	11	14	4
M2156305-M20X1.5	M21563-M20X1.5	MF 20x1.5	1,5	125	17	80	16	12	15	4
	M21563-M20X2	MF 20x2	2	140	25	95	16	12	15	4
	M21563-M22X1.5	MF 22x1.5	1,5	125	18	78	18	14,5	17	5
	M21563-M24X1.5	MF 24x1.5	1,5	140	20	93	18	14,5	17	5
	M21563-M24X2	MF 24x2	2	140	20	93	18	14,5	17	5
	M21563-M27X1.5	MF 27x1.5	1,5	140	20	77	20	16	19	5
	M21563-M27X2	MF 27x2	2	140	20	77	20	16	19	5
	M21563-M30X2	MF 30x2	2	150	20	85	22	18	21	5

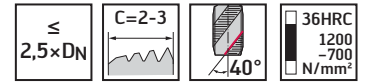
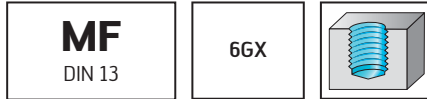


HSS-E machine taps

Paradur® X-pert M

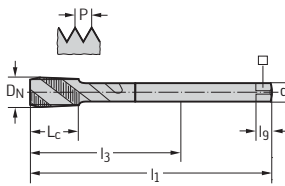


– For long-chipping materials



	P	M	K	N	S	H	O
TIN	●	●●					

DIN 374



Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
M2158305-M8X1	MF 8x1	1	90	12	67	6	4,9	8	3
M2158305-M10X1	MF 10x1	1	90	12	67	7	5,5	8	3
M2158305-M12X1	MF 12x1	1	100	13	73	9	7	10	4
M2158305-M12X1.5	MF 12x1.5	1,5	100	13	73	9	7	10	4
M2158305-M14X1	MF 14x1	1	100	15	71	11	9	12	4
M2158305-M14X1.5	MF 14x1.5	1,5	100	15	71	11	9	12	4
M2158305-M16X1	MF 16x1	1	100	15	58	12	9	12	4
M2158305-M16X1.5	MF 16x1.5	1,5	100	15	58	12	9	12	4

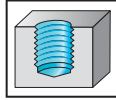


HSS-E machine taps

Paradur Inox® 25

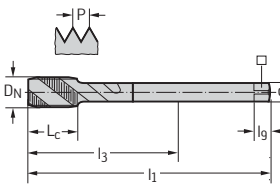


– For long-chipping materials



	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●

DIN 374



Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
2156315-M10X1	MF 10x1	1	90	20	67	7	5,5	8	5
2156315-M12X1	MF 12x1	1	100	21	73	9	7	10	5
2156315-M12X1.5	MF 12x1.5	1,5	100	21	73	9	7	10	5
2156315-M14X1.5	MF 14x1.5	1,5	100	21	71	11	9	12	5
2156315-M16X1.5	MF 16x1.5	1,5	100	21	58	12	9	12	5
2156315-M18X1.5	MF 18x1.5	1,5	110	24	66	14	11	14	5
2156315-M20X1.5	MF 20x1.5	1,5	125	24	80	16	12	15	6
2156315-M22X1.5	MF 22x1.5	1,5	125	24	78	18	14,5	17	6
2156315-M24X1.5	MF 24x1.5	1,5	140	26	93	18	14,5	17	6

B5

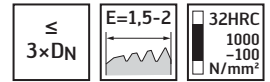


HSS-E-PM machine taps

Paradur® Eco CI



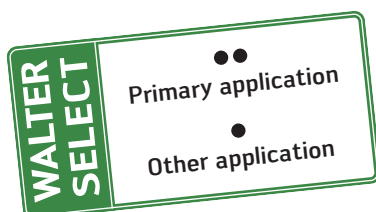
- For short-chipping materials
- Nitrided



	P	M	K	N	S	H	O
TICN			●●	●●			●●

DIN 374										
	Designation TICN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	E2136466-M8X1	MF 8x1	1	90	18	67	6	4,9	8	4
	E2136466-M10X1	MF 10x1	1	90	20	67	7	5,5	8	4
	E2136466-M12X1	MF 12x1	1	100	21	73	9	7	10	4
	E2136466-M12X1.5	MF 12x1.5	1,5	100	21	73	9	7	10	4
	E2136466-M14X1.5	MF 14x1.5	1,5	100	21	71	11	9	12	4
	E2136466-M16X1.5	MF 16x1.5	1,5	100	21	58	12	9	12	4
	E2136466-M18X1.5	MF 18x1.5	1,5	110	24	66	14	11	14	4
	E2136466-M20X1.5	MF 20x1.5	1,5	125	24	80	16	12	15	4
	E2136466-M22X1.5	MF 22x1.5	1,5	125	24	78	18	14,5	17	5

B5

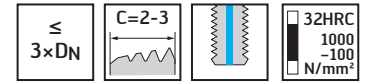
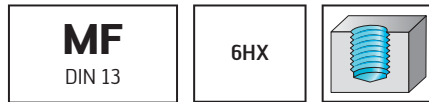


HSS-E-PM machine taps

Paradur® Eco CI



- For short-chipping materials
- Nitrided



	P	M	K	N	S	H	O
TICN			●●	●●			●●

DIN 374										
	Designation TICN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
	E2136416-M8X1	MF 8x1	1	90	18	67	6	4,9	8	4
	E2136416-M10X1	MF 10x1	1	90	20	67	7	5,5	8	4
	E2136416-M12X1	MF 12x1	1	100	21	73	9	7	10	4
	E2136416-M12X1.5	MF 12x1.5	1,5	100	21	73	9	7	10	4
	E2136416-M14X1.5	MF 14x1.5	1,5	100	21	71	11	9	12	4
	E2136416-M16X1.5	MF 16x1.5	1,5	100	21	58	12	9	12	4
	E2136416-M18X1.5	MF 18x1.5	1,5	110	24	66	14	11	14	4
	E2136416-M20X1.5	MF 20x1.5	1,5	125	24	80	16	12	15	4
	E2136416-M22X1.5	MF 22x1.5	1,5	125	24	78	18	14,5	17	5

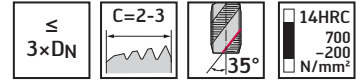
B5

HSS-E machine taps

Paradur® X-pert N



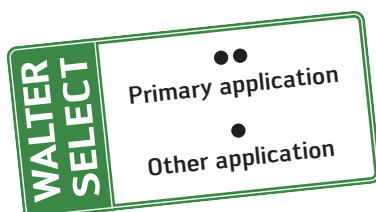
– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated				●	●		●

DIN 374										
	Designation	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	□ mm	l_g mm	N
	Uncoated									
	N21566-M8X1	MF 8x1	1	90	12	67	6	4,9	8	2
	N21566-M10X1	MF 10x1	1	90	12	67	7	5,5	8	3
	N21566-M12X1	MF 12x1	1	100	13	73	9	7	10	3
	N21566-M12X1.5	MF 12x1.5	1,5	100	13	73	9	7	10	3
	N21566-M14X1.5	MF 14x1.5	1,5	100	15	71	11	9	12	3
	N21566-M16X1	MF 16x1	1	100	15	58	12	9	12	4
	N21566-M16X1.5	MF 16x1.5	1,5	100	15	58	12	9	12	3
	N21566-M18X1.5	MF 18x1.5	1,5	110	17	66	14	11	14	4
	N21566-M20X1.5	MF 20x1.5	1,5	125	17	80	16	12	15	4

B5

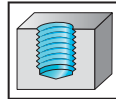


HSS-E-PM machine taps

Paradur® Ni 10

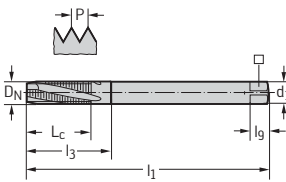


– For long-chipping and short-chipping materials



	P	M	K	N	S	H	O
Uncoated	●●	●●	●●	●●	●●	●●	●●

~DIN 371



Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
214101-M8X1	MF 8x1	1	90	20	66	8	6,2	9	3
214101-M10X1	MF 10x1	1	90	24	62	10	8	11	3
214101-M10X1.25	MF 10x1.25	1,25	100	24,5	72	10	8	11	3
214101-M12X1	MF 12x1	1	100	28	58	12	9	12	4
214101-M12X1.25	MF 12x1.25	1,25	100	28,5	58	12	9	12	4
214101-M12X1.5	MF 12x1.5	1,5	100	29,5	58	12	9	12	4

B5

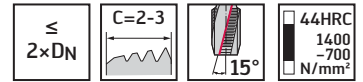


HSS-E-PM machine taps

Paradur® Ti



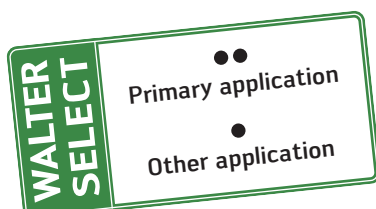
– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●●			●	●●		

~DIN 371		Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
		21416-M8X0.75	MF 8x0.75	0,75	80	10	29	8	6,2	9	3
		21416-M8X1	MF 8x1	1	90	12	29	8	6,2	9	3
		21416-M10X1	MF 10x1	1	90	14	33	10	8	11	3

DIN 374		Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
		21466-M8X0.75	MF 8x0.75	0,75	80	10	57	6	4,9	8	3
		21466-M8X1	MF 8x1	1	90	12	67	6	4,9	8	3
		21466-M10X1	MF 10x1	1	90	14	67	7	5,5	8	3
		21466-M10X1.25	MF 10x1.25	1,25	100	20	77	7	5,5	8	3
		21466-M12X1	MF 12x1	1	100	16	73	9	7	10	4
		21466-M12X1.25	MF 12x1.25	1,25	100	21	73	9	7	10	4
		21466-M12X1.5	MF 12x1.5	1,5	100	21	73	9	7	10	4
		21466-M14X1	MF 14x1	1	100	16	71	11	9	12	4
		21466-M14X1.5	MF 14x1.5	1,5	100	21	71	11	9	12	4
		21466-M16X1	MF 16x1	1	100	18	58	12	9	12	4

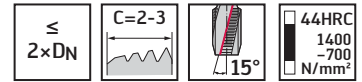


HSS-E-PM machine taps

Paradur® Ti Plus



– For long-chipping materials



ACN	P	M	K	N	S	H	O
					●●		

~DIN 371											
	Designation	D_N	P	l_1	L_c	l_3	d_1	h_9	l_9	N	
	ACN										
	2141663-M6X0.75	MF 6x0.75	0,75	80	15	23	6	4,9	8	3	
	2141663-M8X0.75	MF 8x0.75	0,75	90	18	29,5	8	6,2	9	3	
	2141663-M8X1	MF 8x1	1	90	18	29,5	8	6,2	9	3	
	2141663-M10X1	MF 10x1	1	100	20	33,5	10	8	11	3	

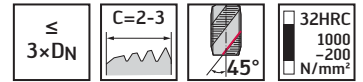
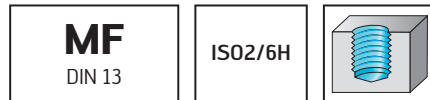
DIN 374											
	Designation	D_N	P	l_1	L_c	l_3	d_1	h_9	l_9	N	
	ACN										
	2146663-M12X1.5	MF 12x1.5	1,5	100	21	73	9	7	10	4	
	2146663-M14X1.5	MF 14x1.5	1,5	100	21	71	11	9	12	4	

HSS-E machine taps

Paradur® Uni

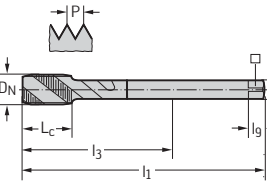


– For long-chipping materials



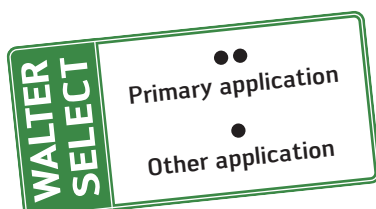
	P	M	K	N	S	H	O
Uncoated	●●		●	●			

DIN 374



Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
7156770-M4X0.5	MF 4x0.5	0,5	63	7	43	2,8	2,1	5	3
7156770-M5X0.5	MF 5x0.5	0,5	70	8	49	3,5	2,7	6	3
7156770-M6X0.5	MF 6x0.5	0,5	80	10	59	4,5	3,4	6	3
7156770-M6X0.75	MF 6x0.75	0,75	80	10	59	4,5	3,4	6	3
7156770-M8X0.75	MF 8x0.75	0,75	80	10	57	6	4,9	8	3
7156770-M8X1	MF 8x1	1	90	12	67	6	4,9	8	3
7156770-M10X1	MF 10x1	1	90	12	67	7	5,5	8	3
7156770-M10X1.25	MF 10x1.25	1,25	100	15	77	7	5,5	8	3
7156770-M12X1	MF 12x1	1	100	13	73	9	7	10	4
7156770-M12X1.25	MF 12x1.25	1,25	100	13	73	9	7	10	4
7156770-M12X1.5	MF 12x1.5	1,5	100	13	73	9	7	10	4
7156770-M14X1.5	MF 14x1.5	1,5	100	15	71	11	9	12	4
7156770-M16X1.5	MF 16x1.5	1,5	100	15	58	12	9	12	5
7156770-M18X1.5	MF 18x1.5	1,5	110	17	66	14	11	14	5
7156770-M20X1.5	MF 20x1.5	1,5	125	17	80	16	12	15	5
7156770-M22X1.5	MF 22x1.5	1,5	125	18	78	18	14,5	17	5
7156770-M24X1.5	MF 24x1.5	1,5	140	20	93	18	14,5	17	5
7156770-M26X1.5	MF 26x1.5	1,5	140	20	93	18	14,5	17	5
7156770-M27X1.5	MF 27x1.5	1,5	140	20	77	20	16	19	5
7156770-M27X2	MF 27x2	2	140	20	77	20	16	19	5
7156770-M28X1.5	MF 28x1.5	1,5	140	20	77	20	16	19	5
7156770-M30X1.5	MF 30x1.5	1,5	150	20	85	22	18	21	5
7156770-M30X2	MF 30x2	2	150	20	85	22	18	21	5

B5

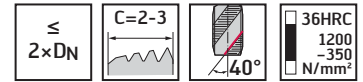


HSS-E-PM machine taps

Paradur® Sprint



– For long-chipping materials



	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●

DIN 374										
	Designation		P	l ₁	L _c	l ₃	d ₁		l _g	N
	TIN	D _N	mm	mm	mm	mm	h9 mm	mm	mm	
	7156365-M8X1	MF 8x1	1	90	12	67	6	4,9	8	3
	7156365-M10X1	MF 10x1	1	90	12	67	7	5,5	8	3
	7156365-M10X1.25	MF 10x1.25	1,25	100	15	77	7	5,5	8	3
	7156365-M12X1.5	MF 12x1.5	1,5	100	13	73	9	7	10	4
	7156365-M14X1.5	MF 14x1.5	1,5	100	15	71	11	9	12	4
	7156365-M16X1.5	MF 16x1.5	1,5	100	15	58	12	9	12	5
	7156365-M18X1.5	MF 18x1.5	1,5	110	17	66	14	11	14	5
	7156365-M20X1.5	MF 20x1.5	1,5	125	17	80	16	12	15	5

B5

HSS-E-PM machine taps

Prototex® Eco Plus

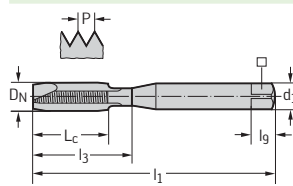


– For long-chipping materials



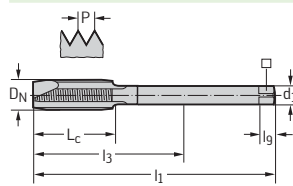
THL	P	M	K	N	S	H	O
	●	●	●	●			

DIN 2184-1



Designation THL	D _N -P	D _N mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	□ mm	l ₉ mm	N
EP2221302-UNC2	UNC 2-56	2,184	45	7	12	2,8	2,1	5	3
EP2221302-UNC4	UNC 4-40	2,845	56	9	18	3,5	2,7	6	3
EP2221302-UNC6	UNC 6-32	3,505	56	11	20	4	3	6	3
EP2221302-UNC8	UNC 8-32	4,166	63	12	21	4,5	3,4	6	3
EP2221302-UNC10	UNC 10-24	4,826	70	13	25	6	4,9	8	3
EP2221302-UNC1/4	UNC 1/4-20	6,35	80	15	30	7	5,5	8	3

DIN 2184-1



Designation THL	D _N -P	D _N mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	□ mm	l ₉ mm	N
EP2226302-UNC5/16	UNC 5/16-18	7,938	90	18	67	6	4,9	8	3
EP2226302-UNC3/8	UNC 3/8-16	9,525	100	20	77	7	5,5	8	3
EP2226302-UNC1/2	UNC 1/2-13	12,7	110	23	83	9	7	10	4
EP2226302-UNC5/8	UNC 5/8-11	15,875	110	25	68	12	9	12	4

B5

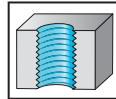
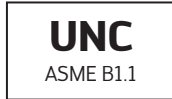


HSS-E machine taps

Prototex® X-pert P

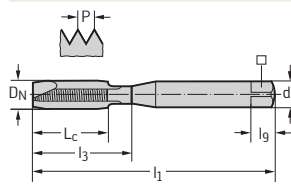


– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

DIN 2184-1-B



Designation Uncoated	DN-P	DN mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	□ mm	l ₉ mm	N
P22200-UNC2	UNC 2-56	2,184	45	7	12	2,8	2,1	5	2
P22200-UNC4	UNC 4-40	2,845	56	9	18	3,5	2,7	6	2
P22200-UNC6	UNC 6-32	3,505	56	11	20	4	3	6	2
P22200-UNC8	UNC 8-32	4,166	63	12	21	4,5	3,4	6	2

B5



HSS-E machine taps

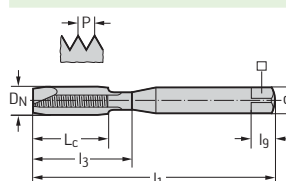
Prototex® X-pert P



– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●●			●			●

DIN 2184-1										
	Designation									
	Uncoated	D _N -P	D _N mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	mm	l _g mm	N
	P22210-UNC2	UNC 2-56	2,184	45	7	12	2,8	2,1	5	2
	P22210-UNC4	UNC 4-40	2,845	56	9	18	3,5	2,7	6	2
	P22210-UNC6	UNC 6-32	3,505	56	11	20	4	3	6	2
	P22210-UNC8	UNC 8-32	4,166	63	12	21	4,5	3,4	6	2

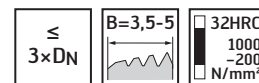
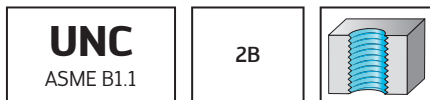
B5



HSS-E machine taps Prototex® X-pert P

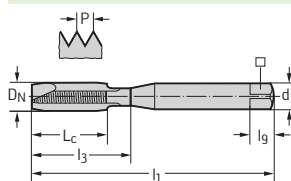


– For long-chipping materials



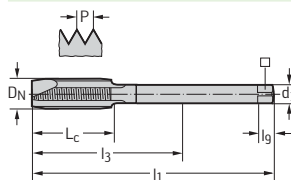
	P	M	K	N	S	H	O
TIN	••			•			•
Uncoated	••			•			•

DIN 2184-1



Designation TIN	Designation Uncoated	D _N -P	D _N mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	□ mm	l ₉ mm	N
	P22310-UNC2	UNC 2-56	2,184	45	7	12	2,8	2,1	5	3
	P22310-UNC4	UNC 4-40	2,845	56	9	18	3,5	2,7	6	3
	P22310-UNC5	UNC 5-40	3,175	56	10	18	3,5	2,7	6	3
P2231005-UNC6	P22310-UNC6	UNC 6-32	3,505	56	11	20	4	3	6	3
	P22310-UNC8	UNC 8-32	4,166	63	12	21	4,5	3,4	6	3
	P22310-UNC10	UNC 10-24	4,826	70	13	25	6	4,9	8	3
	P22310-UNC12	UNC 12-24	5,486	80	15	30	6	4,9	8	3
	P22310-UNC1/4	UNC 1/4-20	6,35	80	15	30	7	5,5	8	3
	P22310-UNC5/16	UNC 5/16-18	7,938	90	18	35	8	6,2	9	3
	P22310-UNC3/8	UNC 3/8-16	9,525	100	20	39	10	8	11	3

DIN 2184-1



Designation TIN	Designation Uncoated	D _N -P	D _N mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	□ mm	l ₉ mm	N
	P22360-UNC7/16	UNC 7/16-14	11,113	100	20	76	8	6,2	9	3
P2236005-UNC1/2	P22360-UNC1/2	UNC 1/2-13	12,7	110	23	83	9	7	10	3
	P22360-UNC9/16	UNC 9/16-12	14,288	110	25	81	11	9	12	3
P2236005-UNC5/8	P22360-UNC5/8	UNC 5/8-11	15,875	110	25	68	12	9	12	3
P2236005-UNC3/4	P22360-UNC3/4	UNC 3/4-10	19,05	125	30	81	14	11	14	3
	P22360-UNC7/8	UNC 7/8-9	22,225	140	30	93	18	14,5	17	3
	P22360-UNC1	UNC 1"-8	25,4	160	36	113	18	14,5	17	3
	P22360-UNC1.1/8	UNC 1.1/8-7	28,575	180	42	115	22	18	21	4
	P22360-UNC1.1/4	UNC 1.1/4-7	31,75	180	42	115	22	18	21	4
	P22360-UNC1.1/2	UNC 1.1/2-6	38,1	200	48	131	28	22	25	4



HSS-E machine taps

Prototex® X-pert M



– For long-chipping materials



	P	M	K	N	S	H	O
TIN	●	●●	●●	●●	●●	●●	●●
VAP	●	●●	●●	●●	●●	●●	●●

DIN 2184-1	Designation TIN	Designation VAP	D _N -P	D _N mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	□ mm	l _g mm	N
	M2221305-UNC2	M22213-UNC2	UNC 2-56	2,184	45	7	12	2,8	2,1	5	2
	M2221305-UNC3	M22213-UNC3	UNC 3-48	2,515	50	8	12,5	2,8	2,1	5	2
	M2221305-UNC4	M22213-UNC4	UNC 4-40	2,845	56	9	18	3,5	2,7	6	2
	M2221305-UNC5	M22213-UNC5	UNC 5-40	3,175	56	10	18	3,5	2,7	6	2
	M2221305-UNC6	M22213-UNC6	UNC 6-32	3,505	56	11	20	4	3	6	2
	M2221305-UNC8	M22213-UNC8	UNC 8-32	4,166	63	12	21	4,5	3,4	6	3
	M2221305-UNC10	M22213-UNC10	UNC 10-24	4,826	70	13	25	6	4,9	8	3
	M2221305-UNC12	M22213-UNC12	UNC 12-24	5,486	80	15	30	6	4,9	8	3
	M2221305-UNC1/4	M22213-UNC1/4	UNC 1/4-20	6,35	80	15	30	7	5,5	8	3

DIN 2184-1	Designation TIN	Designation VAP	D _N -P	D _N mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	□ mm	l _g mm	N
		M22263-UNC5/16	UNC 5/16-18	7,938	90	18	67	6	4,9	8	3
	M2226305-UNC3/8	M22263-UNC3/8	UNC 3/8-16	9,525	100	20	77	7	5,5	8	3
		M22263-UNC7/16	UNC 7/16-14	11,113	100	20	76	8	6,2	9	3
	M2226305-UNC1/2	M22263-UNC1/2	UNC 1/2-13	12,7	110	23	83	9	7	10	4
		M22263-UNC9/16	UNC 9/16-12	14,288	110	25	81	11	9	12	4
		M22263-UNC5/8	UNC 5/8-11	15,875	110	25	68	12	9	12	4
		M22263-UNC3/4	UNC 3/4-10	19,05	125	30	81	14	11	14	4
		M22263-UNC7/8	UNC 7/8-9	22,225	140	30	93	18	14,5	17	4
		M22263-UNC1	UNC 1"-8	25,4	160	36	113	18	14,5	17	4

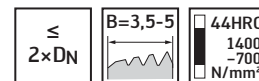
B5

HSS-E-PM machine taps

Prototex® TiNi



– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

~DIN 2184-1		Designation Uncoated	D _N -P	D _N mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	□ mm	l ₉ mm	N
	22207-UNC2	UNC 2-56		2,184	45	9	9	2,8	2,1	5	2
	22207-UNC4	UNC 4-40		2,845	56	10	10	3,5	2,7	6	2
	22207-UNC5	UNC 5-40		3,175	56	10	10	3,5	2,7	6	2
	22207-UNC6	UNC 6-32		3,505	56	12	12	4	3	6	3
	22207-UNC8	UNC 8-32		4,166	63	13	13	4,5	3,4	6	3
	22207-UNC10	UNC 10-24		4,826	70	16	16	6	4,9	8	3
	22207-UNC1/4	UNC 1/4-20		6,35	80	15	25	7	5,5	8	3
	22207-UNC5/16	UNC 5/16-18		7,938	90	18	29,5	8	6,2	9	3
	22207-UNC3/8	UNC 3/8-16		9,525	100	20	33,5	10	8	11	3

B5

DIN 2184-1		Designation Uncoated	D _N -P	D _N mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	□ mm	l ₉ mm	N
	22257-UNC7/16	UNC 7/16-14		11,113	100	20	76	8	6,2	9	4
	22257-UNC1/2	UNC 1/2-13		12,7	110	23	83	9	7	10	4
	22257-UNC5/8	UNC 5/8-11		15,875	110	25	68	12	9	12	4
	22257-UNC3/4	UNC 3/4-10		19,05	125	30	81	14	11	14	4



HSS-E-PM machine taps

Prototex® TiNi



– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●●	●●	●●	●●	●●	●●	●●

~DIN 2184-1		Designation Uncoated	D _N -P	D _N mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	□ mm	l _g mm	N
	22217-UNC2	UNC 2-56		2,184	45	9	9	2,8	2,1	5	2
	22217-UNC4	UNC 4-40		2,845	56	10	10	3,5	2,7	6	2
	22217-UNC5	UNC 5-40		3,175	56	10	10	3,5	2,7	6	2
	22217-UNC6	UNC 6-32		3,505	56	12	12	4	3	6	3
	22217-UNC8	UNC 8-32		4,166	63	13	13	4,5	3,4	6	3
	22217-UNC10	UNC 10-24		4,826	70	16	16	6	4,9	8	3
	22217-UNC1/4	UNC 1/4-20		6,35	80	15	25	7	5,5	8	3
	22217-UNC5/16	UNC 5/16-18		7,938	90	18	29,5	8	6,2	9	3
	22217-UNC3/8	UNC 3/8-16		9,525	100	20	33,5	10	8	11	3

≤ UNC 10: Without reduced neck after the thread

DIN 2184-1		Designation Uncoated	D _N -P	D _N mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	□ mm	l _g mm	N
	22267-UNC7/16	UNC 7/16-14		11,113	100	20	76	8	6,2	9	4
	22267-UNC1/2	UNC 1/2-13		12,7	110	23	83	9	7	10	4
	22267-UNC9/16	UNC 9/16-12		14,288	110	25	81	11	9	12	4
	22267-UNC5/8	UNC 5/8-11		15,875	110	25	68	12	9	12	4
	22267-UNC3/4	UNC 3/4-10		19,05	125	30	81	14	11	14	4

B5

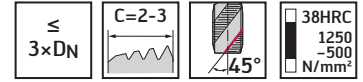


HSS-E-PM machine taps

Paradur® Eco Plus



– For long-chipping materials



	P	M	K	N	S	H	O
THL	●	●	●	●			

~DIN 2184-1											
	Designation THL	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N	
	EP2251302-UNC2	UNC 2-56	2,184	45	4	8,4	2,8	2,1	5	3	
	EP2251302-UNC4	UNC 4-40	2,845	56	6	11	3,5	2,7	6	3	
	EP2251302-UNC6	UNC 6-32	3,505	56	6,5	13,7	4	3	6	3	
	EP2251302-UNC8	UNC 8-32	4,166	63	7	17,8	4,5	3,4	6	3	
	EP2251302-UNC10	UNC 10-24	4,826	70	8	20,7	6	4,9	8	3	
	EP2251302-UNC1/4	UNC 1/4-20	6,35	80	10	27,3	7	5,5	8	3	

UNC 2: Without thread taper

DIN 2184-1											
	Designation THL	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N	
	EP2256302-UNC5/16	UNC 5/16-18	7,938	90	12	67	6	4,9	8	3	
	EP2256302-UNC3/8	UNC 3/8-16	9,525	100	15	77	7	5,5	8	3	
	EP2256302-UNC1/2	UNC 1/2-13	12,7	110	18	83	9	7	10	4	
	EP2256302-UNC5/8	UNC 5/8-11	15,875	110	20	68	12	9	12	4	



HSS-E-PM machine taps

Paradur® Eco Plus



– For long-chipping materials



	P	M	K	N	S	H	O
THL	●	●	●	●			

~DIN 2184-1		Designation THL	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	EP2251312-UNC1/4	UNC 1/4-20		6,35	80	10	27,3	7	5,5	8	3

DIN 2184-1		Designation THL	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	EP2256312-UNC5/16	UNC 5/16-18		7,938	90	12	67	6	4,9	8	3
	EP2256312-UNC3/8	UNC 3/8-16		9,525	100	15	77	7	5,5	8	3
	EP2256312-UNC1/2	UNC 1/2-13		12,7	110	18	83	9	7	10	4
	EP2256312-UNC5/8	UNC 5/8-11		15,875	110	20	68	12	9	12	4
	EP2256312-UNC3/4	UNC 3/4-10		19,05	125	25	81	14	11	14	4

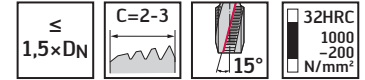
B5

HSS-E machine taps

Paradur® N



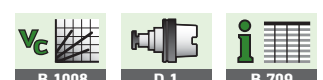
– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●●	●●	●●	●●	●●	●●	●●

DIN 2184-1	Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	22400-UNC2	UNC 2-56	2,184	45	4	12	2,8	2,1	5	3
	22400-UNC4	UNC 4-40	2,845	56	6	18	3,5	2,7	6	3
	22400-UNC6	UNC 6-32	3,505	56	6,5	20	4	3	6	3
	22400-UNC8	UNC 8-32	4,166	63	7	21	4,5	3,4	6	3
	22400-UNC1/4	UNC 1/4-20	6,35	80	10	30	7	5,5	8	3
	22400-UNC5/16	UNC 5/16-18	7,938	90	12	35	8	6,2	9	3
	22400-UNC3/8	UNC 3/8-16	9,525	100	15	39	10	8	11	3

DIN 2184-1	Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	22450-UNC3/8	UNC 3/8-16	9,525	100	15	77	7	5,5	8	3
	22450-UNC7/16	UNC 7/16-14	11,113	100	15	76	8	6,2	9	3
	22450-UNC1/2	UNC 1/2-13	12,7	110	18	83	9	7	10	3
	22450-UNC5/8	UNC 5/8-11	15,875	110	20	68	12	9	12	3
	22450-UNC3/4	UNC 3/4-10	19,05	125	25	81	14	11	14	4
	22450-UNC7/8	UNC 7/8-9	22,225	140	25	93	18	14,5	17	4

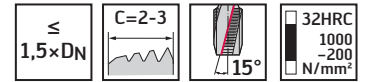


HSS-E machine taps

Paradur® N

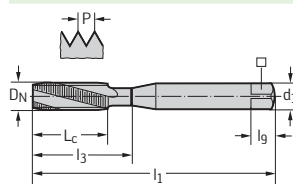


– For long-chipping materials



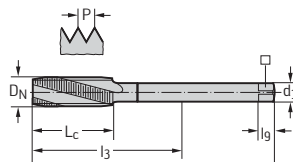
	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

DIN 2184-1



Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
22410-UNC1	UNC 1-64	1,854	45	4	9	2,8	2,1	5	3
22410-UNC2	UNC 2-56	2,184	45	4	12	2,8	2,1	5	3
22410-UNC3	UNC 3-48	2,515	50	4	12,5	2,8	2,1	5	3
22410-UNC4	UNC 4-40	2,845	56	6	18	3,5	2,7	6	3
22410-UNC6	UNC 6-32	3,505	56	6,5	20	4	3	6	3
22410-UNC8	UNC 8-32	4,166	63	7	21	4,5	3,4	6	3
22410-UNC10	UNC 10-24	4,826	70	8	25	6	4,9	8	3
22410-UNC12	UNC 12-24	5,486	80	10	30	6	4,9	8	3
22410-UNC1/4	UNC 1/4-20	6,35	80	10	30	7	5,5	8	3
22410-UNC5/16	UNC 5/16-18	7,938	90	12	35	8	6,2	9	3
22410-UNC3/8	UNC 3/8-16	9,525	100	15	39	10	8	11	3

DIN 2184-1



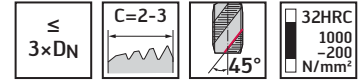
Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
22460-UNC7/16	UNC 7/16-14	11,113	100	15	76	8	6,2	9	3
22460-UNC1/2	UNC 1/2-13	12,7	110	18	83	9	7	10	3
22460-UNC5/8	UNC 5/8-11	15,875	110	20	68	12	9	12	3
22460-UNC3/4	UNC 3/4-10	19,05	125	25	81	14	11	14	4
22460-UNC7/8	UNC 7/8-9	22,225	140	25	93	18	14,5	17	4
22460-UNC1	UNC 1"-8	25,4	160	30	113	18	14,5	17	4

B5

HSS-E machine taps Paradur® X-pert P

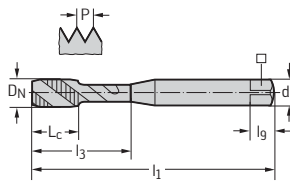


– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

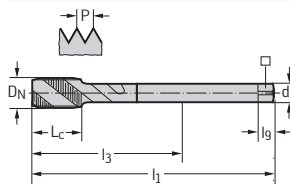
DIN 2184-1



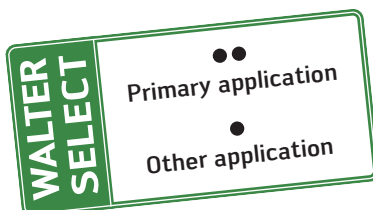
Designation Uncoated	DN-P	DN mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
P22509-UNC2	UNC 2-56	2,184	45	4	12	2,8	2,1	5	3
P22509-UNC3	UNC 3-48	2,515	50	4	12,5	2,8	2,1	5	3
P22509-UNC4	UNC 4-40	2,845	56	6	18	3,5	2,7	6	3
P22509-UNC6	UNC 6-32	3,505	56	6,5	20	4	3	6	3
P22509-UNC8	UNC 8-32	4,166	63	7	21	4,5	3,4	6	3
P22509-UNC10	UNC 10-24	4,826	70	8	25	6	4,9	8	3
P22509-UNC1/4	UNC 1/4-20	6,35	80	10	30	7	5,5	8	3
P22509-UNC5/16	UNC 5/16-18	7,938	90	12	35	8	6,2	9	3
P22509-UNC3/8	UNC 3/8-16	9,525	100	15	39	10	8	11	3

B5

DIN 2184-1



Designation Uncoated	DN-P	DN mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
P22559-UNC5/16	UNC 5/16-18	7,938	90	12	67	6	4,9	8	3
P22559-UNC3/8	UNC 3/8-16	9,525	100	15	77	7	5,5	8	3
P22559-UNC7/16	UNC 7/16-14	11,113	100	15	76	8	6,2	9	3
P22559-UNC1/2	UNC 1/2-13	12,7	110	18	83	9	7	10	4
P22559-UNC9/16	UNC 9/16-12	14,288	110	20	81	11	9	12	4
P22559-UNC5/8	UNC 5/8-11	15,875	110	20	68	12	9	12	4
P22559-UNC3/4	UNC 3/4-10	19,05	125	25	81	14	11	14	4
P22559-UNC7/8	UNC 7/8-9	22,225	140	25	93	18	14,5	17	4
P22559-UNC1	UNC 1"-8	25,4	160	30	113	18	14,5	17	4
P22559-UNC1.1/4	UNC 1.1/4-7	31,75	180	35	115	22	18	21	4

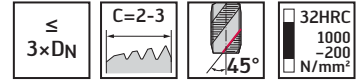


HSS-E machine taps

Paradur® X-pert P

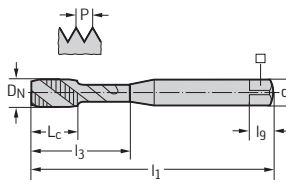


– For long-chipping materials



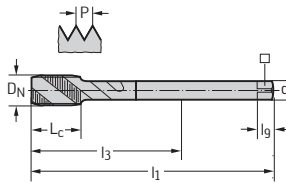
	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

DIN 2184-1



Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
P22519-UNC2	UNC 2-56	2,184	45	4	12	2,8	2,1	5	3
P22519-UNC3	UNC 3-48	2,515	50	4	12,5	2,8	2,1	5	3
P22519-UNC4	UNC 4-40	2,845	56	6	18	3,5	2,7	6	3
P22519-UNC5	UNC 5-40	3,175	56	6	18	3,5	2,7	6	3
P22519-UNC6	UNC 6-32	3,505	56	6,5	20	4	3	6	3
P22519-UNC8	UNC 8-32	4,166	63	7	21	4,5	3,4	6	3
P22519-UNC10	UNC 10-24	4,826	70	8	25	6	4,9	8	3
P22519-UNC12	UNC 12-24	5,486	80	10	30	6	4,9	8	3
P22519-UNC1/4	UNC 1/4-20	6,35	80	10	30	7	5,5	8	3
P22519-UNC5/16	UNC 5/16-18	7,938	90	12	35	8	6,2	9	3
P22519-UNC3/8	UNC 3/8-16	9,525	100	15	39	10	8	11	3

DIN 2184-1



Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
P22569-UNC7/16	UNC 7/16-14	11,113	100	15	76	8	6,2	9	3
P22569-UNC1/2	UNC 1/2-13	12,7	110	18	83	9	7	10	4
P22569-UNC9/16	UNC 9/16-12	14,288	110	20	81	11	9	12	4
P22569-UNC5/8	UNC 5/8-11	15,875	110	20	68	12	9	12	4
P22569-UNC3/4	UNC 3/4-10	19,05	125	25	81	14	11	14	4
P22569-UNC7/8	UNC 7/8-9	22,225	140	25	93	18	14,5	17	4
P22569-UNC1	UNC 1"-8	25,4	160	30	113	18	14,5	17	4
P22569-UNC1.1/8	UNC 1.1/8-7	28,575	180	35	115	22	18	21	4
P22569-UNC1.1/4	UNC 1.1/4-7	31,75	180	35	115	22	18	21	4
P22569-UNC1.1/2	UNC 1.1/2-6	38,1	200	40	131	28	22	25	4

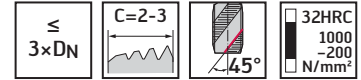
B5

HSS-E machine taps

Paradur® X-pert P

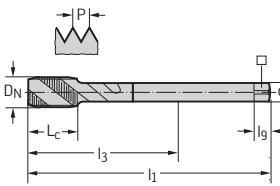


– For long-chipping materials



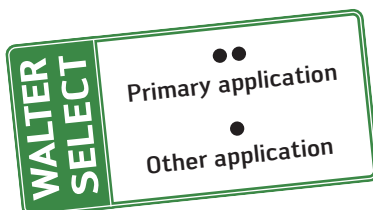
	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

DIN 2184-1



Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
P265676-UN1.1/8	UN 1.1/8-8	28,575	180	30	115	22	18	21	5
P265676-UN1.1/4	UN 1.1/4-8	31,75	180	30	115	22	18	21	5
P265676-UN1.3/8	UN 1.3/8-8	34,925	200	30	131	28	22	25	5
P265676-UN1.1/2	UN 1.1/2-8	38,1	200	30	131	28	22	25	5
P265676-UN1.5/8	UN 1.5/8-8	41,275	200	33	102	32	24	27	6
P265676-UN1.3/4	UN 1.3/4-8	44,45	200	33	97	36	29	32	6
P265676-UN1.7/8	UN 1.7/8-8	47,625	225	36	122	36	29	32	6
P265676-UN2	UN 2"-8	50,8	225	36	95	40	32	35	6
P265676-UN2.1/4	UN 2.1/4-8	57,15	250	36	117	45	35	38	6

B5

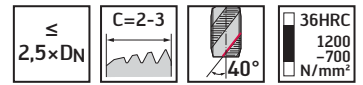


HSS-E machine taps

Paradur® X-pert M



– For long-chipping materials



	P	M	K	N	S	H	O
TIN	●	●●					
VAP	●	●●					

DIN 2184-1	Designation TIN	Designation VAP	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	M2251305-UNC2	M22513-UNC2	UNC 2-56	2,184	45	4	12	2,8	2,1	5	3
	M2251305-UNC3	M22513-UNC3	UNC 3-48	2,515	50	4	12,5	2,8	2,1	5	3
	M2251305-UNC4	M22513-UNC4	UNC 4-40	2,845	56	6	18	3,5	2,7	6	3
	M2251305-UNC5	M22513-UNC5	UNC 5-40	3,175	56	6	18	3,5	2,7	6	3
	M2251305-UNC6	M22513-UNC6	UNC 6-32	3,505	56	6,5	20	4	3	6	3
	M2251305-UNC8	M22513-UNC8	UNC 8-32	4,166	63	7	21	4,5	3,4	6	3
	M2251305-UNC10	M22513-UNC10	UNC 10-24	4,826	70	8	25	6	4,9	8	3
	M2251305-UNC12	M22513-UNC12	UNC 12-24	5,486	80	10	30	6	4,9	8	3
	M2251305-UNC1/4	M22513-UNC1/4	UNC 1/4-20	6,35	80	10	30	7	5,5	8	3

UNC 2: Without thread taper

DIN 2184-1	Designation TIN	Designation VAP	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	M2256305-UNC5/16	M22563-UNC5/16	UNC 5/16-18	7,938	90	12	67	6	4,9	8	3
	M2256305-UNC3/8	M22563-UNC3/8	UNC 3/8-16	9,525	100	15	77	7	5,5	8	3
	M2256305-UNC7/16	M22563-UNC7/16	UNC 7/16-14	11,113	100	15	76	8	6,2	9	3
	M2256305-UNC1/2	M22563-UNC1/2	UNC 1/2-13	12,7	110	18	83	9	7	10	4
	M2256305-UNC9/16	M22563-UNC9/16	UNC 9/16-12	14,288	110	20	81	11	9	12	4
	M2256305-UNC5/8	M22563-UNC5/8	UNC 5/8-11	15,875	110	20	68	12	9	12	4
	M2256305-UNC3/4	M22563-UNC3/4	UNC 3/4-10	19,05	125	25	81	14	11	14	4
	M2256305-UNC7/8	M22563-UNC7/8	UNC 7/8-9	22,225	140	25	93	18	14,5	17	4
	M2256305-UNC1	M22563-UNC1	UNC 1"-8	25,4	160	30	113	18	14,5	17	4
		M22563-UNC1.1/8	UNC 1.1/8-7	28,575	180	35	115	22	18	21	5
		M22563-UNC1.1/4	UNC 1.1/4-7	31,75	180	35	115	22	18	21	5
		M22563-UNC1.1/2	UNC 1.1/2-6	38,1	200	40	131	28	22	25	5

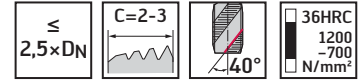
B5



HSS-E machine taps Paradur® X-pert M

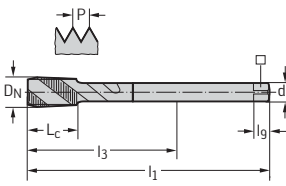


– For long-chipping materials



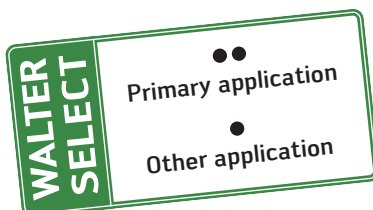
	P	M	K	N	S	H	O
VAP	●	●●					

DIN 2184-1-C



Designation VAP	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
M225532-UN1.1/8	UN 1.1/8-8	28,575	180	30	115	22	18	21	4
M225532-UN1.1/4	UN 1.1/4-8	31,75	180	30	115	22	18	21	4
M225532-UN1.3/8	UN 1.3/8-8	34,925	200	30	131	28	22	25	5

B5

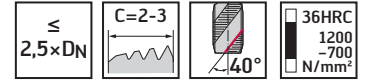


HSS-E machine taps

Paradur® X-pert M

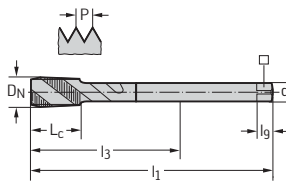


– For long-chipping materials



	P	M	K	N	S	H	O
VAP	●	●●					

DIN 2184-1



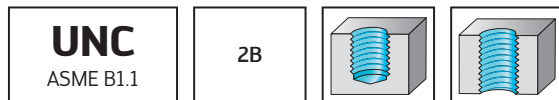
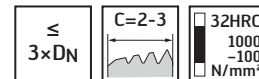
Designation VAP	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
M225632-UN1.1/8	UN 1.1/8-8	28,575	180	30	115	22	18	21	4
M225632-UN1.1/4	UN 1.1/4-8	31,75	180	30	115	22	18	21	4
M225632-UN1.3/8	UN 1.3/8-8	34,925	200	30	131	28	22	25	5
M225632-UN1.1/2	UN 1.1/2-8	38,1	200	30	131	28	22	25	5
M225632-UN1.5/8	UN 1.5/8-8	41,275	200	33	102	32	24	27	5
M225632-UN1.3/4	UN 1.3/4-8	44,45	200	33	97	36	29	32	6
M225632-UN1.7/8	UN 1.7/8-8	47,625	225	36	122	36	29	32	6
M225632-UN2	UN 2"-8	50,8	225	36	95	40	32	35	6

HSS-E-PM machine taps

Paradur® Eco CI

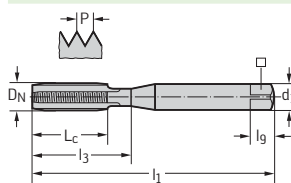


- For short-chipping materials
- Nitrided



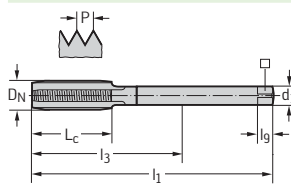
	P	M	K	N	S	H	O
NID			●●	●●			●●

DIN 2184-1



Designation NID	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
E22314-UNC6	UNC 6-32	3,505	56	11	20	4	3	6	3
E22314-UNC8	UNC 8-32	4,166	63	12	21	4,5	3,4	6	3
E22314-UNC10	UNC 10-24	4,826	70	13	25	6	4,9	8	4
E22314-UNC1/4	UNC 1/4-20	6,35	80	15	30	7	5,5	8	4

DIN 2184-1



Designation NID	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
E22364-UNC5/16	UNC 5/16-18	7,938	90	18	67	6	4,9	8	4
E22364-UNC3/8	UNC 3/8-16	9,525	100	20	77	7	5,5	8	4
E22364-UNC7/16	UNC 7/16-14	11,113	100	20	76	8	6,2	9	4
E22364-UNC1/2	UNC 1/2-13	12,7	110	23	83	9	7	10	4
E22364-UNC9/16	UNC 9/16-12	14,288	110	25	81	11	9	12	4
E22364-UNC5/8	UNC 5/8-11	15,875	110	25	68	12	9	12	4
E22364-UNC3/4	UNC 3/4-10	19,05	125	30	81	14	11	14	4
E22364-UNC7/8	UNC 7/8-9	22,225	140	30	93	18	14,5	17	4

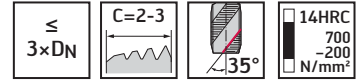


HSS-E machine taps

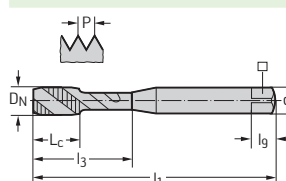
Paradur® X-pert N



– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated				●	●		●

DIN 2184-1		Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	N22516-UNC2	UNC 2-56		2,184	45	4	12	2,8	2,1	5	2
	N22516-UNC4	UNC 4-40		2,845	56	6	18	3,5	2,7	6	2
	N22516-UNC6	UNC 6-32		3,505	56	6,5	20	4	3	6	2
	N22516-UNC8	UNC 8-32		4,166	63	7	21	4,5	3,4	6	2
	N22516-UNC10	UNC 10-24		4,826	70	8	25	6	4,9	8	2
	N22516-UNC1/4	UNC 1/4-20		6,35	80	10	30	7	5,5	8	2
	N22516-UNC5/16	UNC 5/16-18		7,938	90	12	35	8	6,2	9	2
	N22516-UNC3/8	UNC 3/8-16		9,525	100	15	39	10	8	11	2

B5

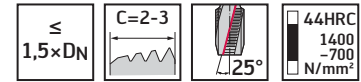


HSS-E-PM machine taps

Paradur® Ni



– For long-chipping materials

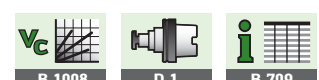


	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

~DIN 2184-1		Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	224104-UNC2	UNC 2-56		2,184	45	9	9	2,8	2,1	5	3
	224104-UNC4	UNC 4-40		2,845	56	10	10	3,5	2,7	6	3
	224104-UNC6	UNC 6-32		3,505	56	12	12	4	3	6	3
	224104-UNC8	UNC 8-32		4,166	63	13	13	4,5	3,4	6	3
	224104-UNC1/4	UNC 1/4-20		6,35	80	15	25	7	5,5	8	3
	224104-UNC5/16	UNC 5/16-18		7,938	90	18	29,5	8	6,2	9	3
	224104-UNC3/8	UNC 3/8-16		9,525	100	20	33,5	10	8	11	4

≤ UNC 8: Without reduced neck after the thread

DIN 2184-1		Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	224604-UNC7/16	UNC 7/16-14		11,113	100	20	76	8	6,2	9	4
	224604-UNC1/2	UNC 1/2-13		12,7	110	23	83	9	7	10	4
	224604-UNC9/16	UNC 9/16-12		14,288	110	25	81	11	9	12	4
	224604-UNC5/8	UNC 5/8-11		15,875	110	25	68	12	9	12	4
	224604-UNC3/4	UNC 3/4-10		19,05	125	30	81	14	11	14	5

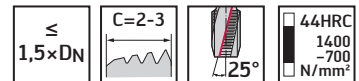
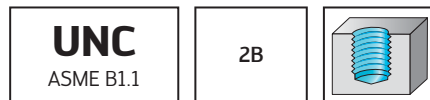


HSS-E-PM machine taps

Paradur® Ni



– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●				●●		

~DIN 2184-1										
	Designation	D_N-P	D_N	l_1	L_c	l_3	d_1	h_9	l_9	N
	Uncoated		mm	mm	mm	mm	mm	mm	mm	
	224102-UNC2	UNC 2-56	2,184	45	9	9	2,8	2,1	5	3
	224102-UNC3	UNC 3-48	2,515	50	9	9	2,8	2,1	5	3
	224102-UNC4	UNC 4-40	2,845	56	10	10	3,5	2,7	6	3
	224102-UNC6	UNC 6-32	3,505	56	12	12	4	3	6	3
	224102-UNC8	UNC 8-32	4,166	63	13	13	4,5	3,4	6	3
	224102-UNC10	UNC 10-24	4,826	70	16	16	6	4,9	8	3
	224102-UNC1/4	UNC 1/4-20	6,35	80	15	25	7	5,5	8	3
	224102-UNC5/16	UNC 5/16-18	7,938	90	18	29,5	8	6,2	9	3
	224102-UNC3/8	UNC 3/8-16	9,525	100	20	33,5	10	8	11	4

≤ UNC 10: Without reduced neck after the thread

DIN 2184-1										
	Designation	D_N-P	D_N	l_1	L_c	l_3	d_1	h_9	l_9	N
	Uncoated		mm	mm	mm	mm	mm	mm	mm	
	224602-UNC7/16	UNC 7/16-14	11,113	100	20	76	8	6,2	9	4
	224602-UNC1/2	UNC 1/2-13	12,7	110	23	83	9	7	10	4
	224602-UNC5/8	UNC 5/8-11	15,875	110	25	68	12	9	12	4
	224602-UNC3/4	UNC 3/4-10	19,05	125	30	81	14	11	14	5

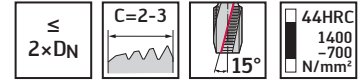
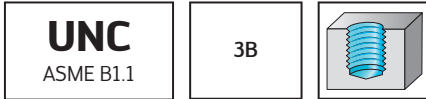
B5

HSS-E-PM machine taps

Paradur® Ti

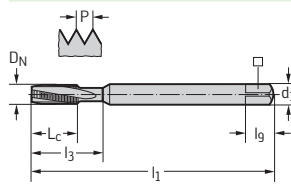


– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●●			●	●●		

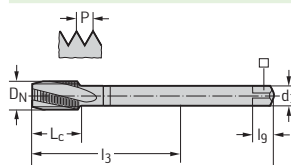
~DIN 2184-1



Designation Uncoated	DN-P	DN mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
224164-UNC6	UNC 6-32	3,505	56	12	12	4	3	6	3
224164-UNC8	UNC 8-32	4,166	63	13	13	4,5	3,4	6	3
224164-UNC10	UNC 10-24	4,826	70	16	16	6	4,9	8	3
224164-UNC1/4	UNC 1/4-20	6,35	80	15	25	7	5,5	8	3
224164-UNC5/16	UNC 5/16-18	7,938	90	18	29,5	8	6,2	9	3
224164-UNC3/8	UNC 3/8-16	9,525	100	20	33,5	10	8	11	3

≤ UNC 10: Without reduced neck after the thread

DIN 2184-1



Designation Uncoated	DN-P	DN mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
224664-UNC7/16	UNC 7/16-14	11,113	100	20	76	8	6,2	9	4
224664-UNC1/2	UNC 1/2-13	12,7	110	23	83	9	7	10	4
224664-UNC5/8	UNC 5/8-11	15,875	110	25	68	12	9	12	4

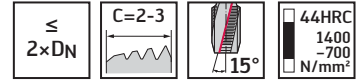


HSS-E-PM machine taps

Paradur® Ti



– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●●			●	●●		

~DIN 2184-1										
	Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	22416-UNC6	UNC 6-32	3,505	56	12	12	4	3	6	3
	22416-UNC8	UNC 8-32	4,166	63	13	13	4,5	3,4	6	3
	22416-UNC10	UNC 10-24	4,826	70	16	16	6	4,9	8	3
	22416-UNC12	UNC 12-24	5,486	80	15	23	6	4,9	8	3
	22416-UNC1/4	UNC 1/4-20	6,35	80	15	25	7	5,5	8	3
	22416-UNC5/16	UNC 5/16-18	7,938	90	18	29,5	8	6,2	9	3
	22416-UNC3/8	UNC 3/8-16	9,525	100	20	33,5	10	8	11	3

≤ UNC 10: Without reduced neck after the thread

DIN 2184-1										
	Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	22466-UNC7/16	UNC 7/16-14	11,113	100	20	76	8	6,2	9	4
	22466-UNC1/2	UNC 1/2-13	12,7	110	23	83	9	7	10	4
	22466-UNC5/8	UNC 5/8-11	15,875	110	25	68	12	9	12	4

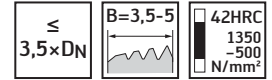
B5

HSS-E-PM machine taps

Prototex® Eco Plus

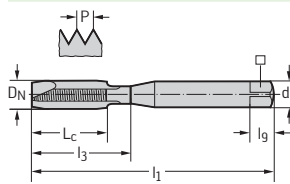


– For long-chipping materials



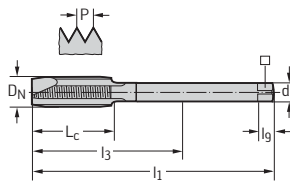
	P	M	K	N	S	H	O
THL	●	●	●	●			

DIN 2184-1



Designation THL	D _N -P	D _N mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	□ mm	l ₉ mm	N
EP2321302-UNF4	UNF 4-48	2,845	56	9	18	3,5	2,7	6	3
EP2321302-UNF6	UNF 6-40	3,505	56	11	20	4	3	6	3
EP2321302-UNF8	UNF 8-36	4,166	63	12	21	4,5	3,4	6	3
EP2321302-UNF10	UNF 10-32	4,826	70	13	25	6	4,9	8	3
EP2321302-UNF1/4	UNF 1/4-28	6,35	80	15	30	7	5,5	8	3

DIN 2184-1



Designation THL	D _N -P	D _N mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	□ mm	l ₉ mm	N
EP2326302-UNF5/16	UNF 5/16-24	7,938	90	18	67	6	4,9	8	3
EP2326302-UNF3/8	UNF 3/8-24	9,525	100	20	77	7	5,5	8	3
EP2326302-UNF1/2	UNF 1/2-20	12,7	100	21	73	9	7	10	4
EP2326302-UNF5/8	UNF 5/8-18	15,875	100	21	58	12	9	12	4



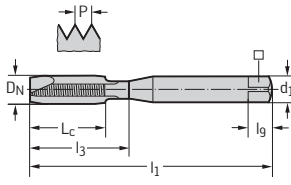
HSS-E machine taps Prototex® X-pert P



– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

DIN 2184-1-B										
	Designation Uncoated	D _N -P	D _N mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	□ mm	l _g mm	N
	P23200-UNF2	UNF 2-64	2,184	45	7	12	2,8	2,1	5	2
	P23200-UNF4	UNF 4-48	2,845	56	9	18	3,5	2,7	6	2
	P23200-UNF6	UNF 6-40	3,505	56	11	20	4	3	6	2
	P23200-UNF8	UNF 8-36	4,166	63	12	21	4,5	3,4	6	2
	P23200-UNF10	UNF 10-32	4,826	70	13	25	6	4,9	8	2
	P23200-UNF12	UNF 12-28	5,486	80	15	30	6	4,9	8	3
	P23200-UNF1/4	UNF 1/4-28	6,35	80	15	30	7	5,5	8	3

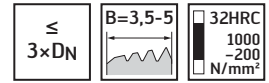
B5



HSS-E machine taps Prototex® X-pert P

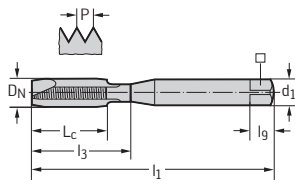


– For long-chipping materials



	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●
Uncoated	●	●	●	●	●	●	●

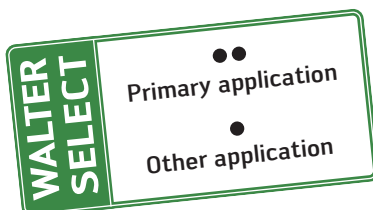
DIN 2184-1



Designation TIN	Designation Uncoated	D _N -P	D _N mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	□ mm	l ₉ mm	N
	P23210-UNF0	UNF 0-80	1,524	40	8	8	2,5	2,1	5	2
	P23210-UNF1	UNF 1-72	1,854	45	6	9	2,8	2,1	5	2
	P23210-UNF2	UNF 2-64	2,184	45	7	12	2,8	2,1	5	2
	P23210-UNF3	UNF 3-56	2,515	50	8	12,5	2,8	2,1	5	2
	P23210-UNF4	UNF 4-48	2,845	56	9	18	3,5	2,7	6	2
	P23210-UNF6	UNF 6-40	3,505	56	11	20	4	3	6	2
	P23210-UNF8	UNF 8-36	4,166	63	12	21	4,5	3,4	6	2
	P23210-UNF10	UNF 10-32	4,826	70	13	25	6	4,9	8	2
P2321005-UNF12	P23210-UNF12	UNF 12-28	5,486	80	15	30	6	4,9	8	3
P2321005-UNF1/4	P23210-UNF1/4	UNF 1/4-28	6,35	80	15	30	7	5,5	8	3

UNF 0: Without reduced neck after the thread

B5



HSS-E machine taps

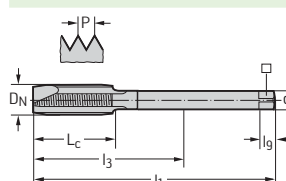
Prototex® X-pert P



– For long-chipping materials



	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●
Uncoated	●	●	●	●	●	●	●

DIN 2184-1												
	Designation TIN	Designation Uncoated	D _N -P	D _N mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	□ mm	l _g mm	N	
	P2336005-UNF5/16	P23360-UNF5/16	UNF 5/16-24	7,938	90	18	67	6	4,9	8	3	
	P2336005-UNF3/8	P23360-UNF3/8	UNF 3/8-24	9,525	100	20	77	7	5,5	8	3	
	P2336005-UNF7/16	P23360-UNF7/16	UNF 7/16-20	11,113	100	20	76	8	6,2	9	3	
	P2336005-UNF1/2	P23360-UNF1/2	UNF 1/2-20	12,7	100	21	73	9	7	10	4	
	P2336005-UNF5/8	P23360-UNF5/8	UNF 5/8-18	15,875	100	21	58	12	9	12	4	
	P2336005-UNF3/4	P23360-UNF3/4	UNF 3/4-16	19,05	110	24	66	14	11	14	4	
		P23360-UNF7/8	UNF 7/8-14	22,225	125	24	78	18	14,5	17	4	
		P23360-UNF1	UNF 1"-12	25,4	140	26	93	18	14,5	17	4	
		P23360-UNF1.1/8	UNF 1.1/8-12	28,575	150	26	85	22	18	21	4	
		P23360-UNF1.1/4	UNF 1.1/4-12	31,75	150	26	85	22	18	21	4	
		P23360-UNF1.3/8	UNF 1.3/8-12	34,925	170	28	101	28	22	25	4	
		P23360-UNF1.1/2	UNF 1.1/2-12	38,1	170	28	101	28	22	25	4	

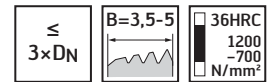
B5



HSS-E machine taps Prototex® X-pert M



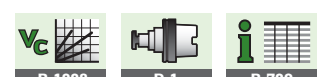
– For long-chipping materials



	P	M	K	N	S	H	O
TIN	●	●●	●	●	●	●	●
VAP	●	●●	●	●	●	●	●

DIN 2184-1	Designation TIN	Designation VAP	D _N -P	D _N mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	□ mm	l _g mm	N
		M23213-UNF5	UNF 5-44	3,175	56	10	18	3,5	2,7	6	2
		M23213-UNF6	UNF 6-40	3,505	56	11	20	4	3	6	2
		M23213-UNF8	UNF 8-36	4,166	63	12	21	4,5	3,4	6	2
	M2321305-UNF10	M23213-UNF10	UNF 10-32	4,826	70	13	25	6	4,9	8	3
		M23213-UNF12	UNF 12-28	5,486	80	15	30	6	4,9	8	3
	M2321305-UNF1/4	M23213-UNF1/4	UNF 1/4-28	6,35	80	15	30	7	5,5	8	3

DIN 2184-1	Designation TIN	Designation VAP	D _N -P	D _N mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	□ mm	l _g mm	N
	M2326305-UNF5/16	M23263-UNF5/16	UNF 5/16-24	7,938	90	18	67	6	4,9	8	3
	M2326305-UNF3/8	M23263-UNF3/8	UNF 3/8-24	9,525	100	20	77	7	5,5	8	3
	M2326305-UNF7/16	M23263-UNF7/16	UNF 7/16-20	11,113	100	20	76	8	6,2	9	3
	M2326305-UNF1/2	M23263-UNF1/2	UNF 1/2-20	12,7	100	21	73	9	7	10	4
		M23263-UNF9/16	UNF 9/16-18	14,288	100	21	71	11	9	12	4
		M23263-UNF5/8	UNF 5/8-18	15,875	100	21	58	12	9	12	4
		M23263-UNF3/4	UNF 3/4-16	19,05	110	24	66	14	11	14	4
		M23263-UNF7/8	UNF 7/8-14	22,225	125	24	78	18	14,5	17	4
		M23263-UNF1	UNF 1"-12	25,4	140	26	93	18	14,5	17	4



HSS-E-PM machine taps

Prototex® TiNi



– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

~DIN 2184-1		Designation Uncoated	D _N -P	D _N mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	□ mm	l _g mm	N
	23207-UNF4	UNF 4-48		2,845	56	10	10	3,5	2,7	6	2
	23207-UNF5	UNF 5-44		3,175	56	10	10	3,5	2,7	6	2
	23207-UNF6	UNF 6-40		3,505	56	12	12	4	3	6	3
	23207-UNF8	UNF 8-36		4,166	63	13	13	4,5	3,4	6	3
	23207-UNF10	UNF 10-32		4,826	70	16	16	6	4,9	8	3
	23207-UNF1/4	UNF 1/4-28		6,35	80	15	25	7	5,5	8	3
	23207-UNF5/16	UNF 5/16-24		7,938	90	18	29,5	8	6,2	9	3
	23207-UNF3/8	UNF 3/8-24		9,525	100	20	33,5	10	8	11	3

≤ UNF 10: Without reduced neck after the thread

DIN 2184-1		Designation Uncoated	D _N -P	D _N mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	□ mm	l _g mm	N
	23257-UNF7/16	UNF 7/16-20		11,113	100	20	76	8	6,2	9	4
	23257-UNF1/2	UNF 1/2-20		12,7	100	23	73	9	7	10	4
	23257-UNF5/8	UNF 5/8-18		15,875	100	25	58	12	9	12	4

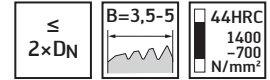
B5

HSS-E-PM machine taps

Prototex® TiNi



– For long-chipping materials

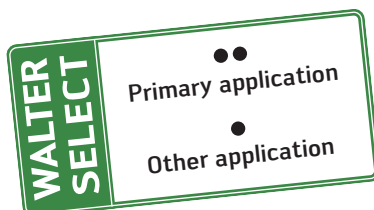


	P	M	K	N	S	H	O
Uncoated	●●	●●	●●	●●	●●	●●	●●

~DIN 2184-1		Designation Uncoated	D _N -P	D _N mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	□ mm	l ₉ mm	N
	23217-UNF5	UNF 5-44		3,175	56	10	10	3,5	2,7	6	2
	23217-UNF6	UNF 6-40		3,505	56	12	12	4	3	6	3
	23217-UNF10	UNF 10-32		4,826	70	16	16	6	4,9	8	3
	23217-UNF1/4	UNF 1/4-28		6,35	80	15	25	7	5,5	8	3
	23217-UNF5/16	UNF 5/16-24		7,938	90	18	29,5	8	6,2	9	3
	23217-UNF3/8	UNF 3/8-24		9,525	100	20	33,5	10	8	11	3

≤ UNF 10: Without reduced neck after the thread

DIN 2184-1		Designation Uncoated	D _N -P	D _N mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	□ mm	l ₉ mm	N
	23267-UNF7/16	UNF 7/16-20		11,113	100	20	76	8	6,2	9	4
	23267-UNF1/2	UNF 1/2-20		12,7	100	23	73	9	7	10	4
	23267-UNF5/8	UNF 5/8-18		15,875	100	25	58	12	9	12	4

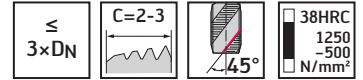


HSS-E-PM machine taps

Paradur® Eco Plus



– For long-chipping materials



	P	M	K	N	S	H	O
THL	●	●	●	●			

~DIN 2184-1		Designation THL	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	EP2351302-UNF4	UNF 4-48		2,845	56	6	11	3,5	2,7	6	3
	EP2351302-UNF6	UNF 6-40		3,505	56	6,5	13,1	4	3	6	3
	EP2351302-UNF8	UNF 8-36		4,166	63	7	17,4	4,5	3,4	6	3
	EP2351302-UNF10	UNF 10-32		4,826	70	8	20,7	6	4,9	8	3
	EP2351302-UNF1/4	UNF 1/4-28		6,35	80	10	25,9	7	5,5	8	3

DIN 2184-1		Designation THL	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	EP2356302-UNF5/16	UNF 5/16-24		7,938	90	12	67	6	4,9	8	3
	EP2356302-UNF3/8	UNF 3/8-24		9,525	100	15	77	7	5,5	8	3
	EP2356302-UNF1/2	UNF 1/2-20		12,7	100	13	73	9	7	10	4
	EP2356302-UNF5/8	UNF 5/8-18		15,875	100	15	58	12	9	12	4

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HSS-E-PM machine taps

Paradur® Eco Plus



– For long-chipping materials



	P	M	K	N	S	H	O
THL	●	●	●	●			

~DIN 2184-1										
Designation THL	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N	
EP2351312-UNF1/4	UNF 1/4-28	6,35	80	10	25,9	7	5,5	8	3	

DIN 2184-1										
Designation THL	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N	
EP2356312-UNF5/16	UNF 5/16-24	7,938	90	12	67	6	4,9	8	3	
EP2356312-UNF3/8	UNF 3/8-24	9,525	100	15	77	7	5,5	8	3	
EP2356312-UNF1/2	UNF 1/2-20	12,7	100	13	73	9	7	10	4	
EP2356312-UNF5/8	UNF 5/8-18	15,875	100	15	58	12	9	12	4	

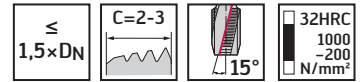


HSS-E machine taps

Paradur® N



– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●●	●	●●	●●	●	●	●

DIN 2184-1

	Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	23400-UNF0	UNF 0-80	1,524	40	6	6	2,5	2,1	5	3
	23400-UNF4	UNF 4-48	2,845	56	6	18	3,5	2,7	6	3
	23400-UNF8	UNF 8-36	4,166	63	7	21	4,5	3,4	6	3
	23400-UNF10	UNF 10-32	4,826	70	8	25	6	4,9	8	3
	23400-UNF12	UNF 12-28	5,486	80	10	30	6	4,9	8	3
	23400-UNF1/4	UNF 1/4-28	6,35	80	10	30	7	5,5	8	3
	23400-UNF5/16	UNF 5/16-24	7,938	90	12	35	8	6,2	9	3
	23400-UNF3/8	UNF 3/8-24	9,525	100	15	39	10	8	11	3

UNF 0: Without reduced neck after the thread

DIN 2184-1

	Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	23450-UNF5/16	UNF 5/16-24	7,938	90	13	67	6	4,9	8	3
	23450-UNF3/8	UNF 3/8-24	9,525	100	15	77	7	5,5	8	3
	23450-UNF7/16	UNF 7/16-20	11,113	100	15	76	8	6,2	9	3
	23450-UNF1/2	UNF 1/2-20	12,7	100	13	73	9	7	10	3
	23450-UNF9/16	UNF 9/16-18	14,288	100	15	71	11	9	12	4
	23450-UNF5/8	UNF 5/8-18	15,875	100	15	58	12	9	12	4
	23450-UNF3/4	UNF 3/4-16	19,05	110	17	66	14	11	14	4
	23450-UNF7/8	UNF 7/8-14	22,225	125	18	78	18	14,5	17	4

B5

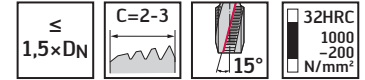


HSS-E machine taps

Paradur® N



– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●●		●●	●●			

DIN 2184-1	Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	23410-UNF0	UNF 0-80	1,524	40	6	6	2,5	2,1	5	3
	23410-UNF1	UNF 1-72	1,854	45	4	9	2,8	2,1	5	3
	23410-UNF2	UNF 2-64	2,184	45	4	12	2,8	2,1	5	3
	23410-UNF4	UNF 4-48	2,845	56	6	18	3,5	2,7	6	3
	23410-UNF6	UNF 6-40	3,505	56	6,5	20	4	3	6	3
	23410-UNF8	UNF 8-36	4,166	63	7	21	4,5	3,4	6	3
	23410-UNF10	UNF 10-32	4,826	70	8	25	6	4,9	8	3
	23410-UNF12	UNF 12-28	5,486	80	10	30	6	4,9	8	3
	23410-UNF1/4	UNF 1/4-28	6,35	80	10	30	7	5,5	8	3
	23410-UNF5/16	UNF 5/16-24	7,938	90	12	35	8	6,2	9	3
	23410-UNF3/8	UNF 3/8-24	9,525	100	15	39	10	8	11	3

UNF 0: Without reduced neck after the thread

DIN 2184-1	Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	23460-UNF5/16	UNF 5/16-24	7,938	90	13	67	6	4,9	8	3
	23460-UNF3/8	UNF 3/8-24	9,525	100	15	77	7	5,5	8	3
	23460-UNF7/16	UNF 7/16-20	11,113	100	15	76	8	6,2	9	3
	23460-UNF1/2	UNF 1/2-20	12,7	100	13	73	9	7	10	3
	23460-UNF9/16	UNF 9/16-18	14,288	100	15	71	11	9	12	4
	23460-UNF5/8	UNF 5/8-18	15,875	100	15	58	12	9	12	4
	23460-UNF3/4	UNF 3/4-16	19,05	110	17	66	14	11	14	4
	23460-UNF7/8	UNF 7/8-14	22,225	125	18	78	18	14,5	17	4

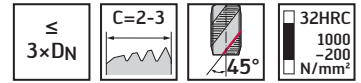


HSS-E machine taps

Paradur® X-pert P

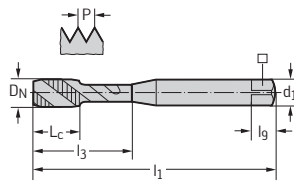


– For long-chipping materials



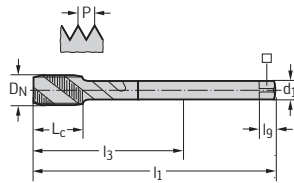
	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●
Uncoated	●	●	●	●	●	●	●

DIN 2184-1



Designation TIN	Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
	P23519-UNF1	UNF 1-72	1,854	45	4	9	2,8	2,1	5	3
	P23519-UNF2	UNF 2-64	2,184	45	4	12	2,8	2,1	5	3
	P23519-UNF3	UNF 3-56	2,515	50	4	12,5	2,8	2,1	5	3
	P23519-UNF4	UNF 4-48	2,845	56	6	18	3,5	2,7	6	3
	P23519-UNF5	UNF 5-44	3,175	56	6	18	3,5	2,7	6	3
	P23519-UNF6	UNF 6-40	3,505	56	6,5	20	4	3	6	3
	P23519-UNF8	UNF 8-36	4,166	63	7	21	4,5	3,4	6	3
P2351905-UNF10	P23519-UNF10	UNF 10-32	4,826	70	8	25	6	4,9	8	3
	P23519-UNF12	UNF 12-28	5,486	80	10	30	6	4,9	8	3
P2351905-UNF1/4	P23519-UNF1/4	UNF 1/4-28	6,35	80	10	30	7	5,5	8	3

DIN 2184-1



Designation TIN	Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
P2356905-UNF5/16	P23569-UNF5/16	UNF 5/16-24	7,938	90	12	67	6	4,9	8	3
P2356905-UNF3/8	P23569-UNF3/8	UNF 3/8-24	9,525	100	15	77	7	5,5	8	3
P2356905-UNF7/16	P23569-UNF7/16	UNF 7/16-20	11,113	100	15	76	8	6,2	9	3
P2356905-UNF1/2	P23569-UNF1/2	UNF 1/2-20	12,7	100	13	73	9	7	10	4
P2356905-UNF9/16	P23569-UNF9/16	UNF 9/16-18	14,288	100	15	71	11	9	12	4
P2356905-UNF5/8	P23569-UNF5/8	UNF 5/8-18	15,875	100	15	58	12	9	12	4
P2356905-UNF3/4	P23569-UNF3/4	UNF 3/4-16	19,05	110	17	66	14	11	14	4
P2356905-UNF7/8	P23569-UNF7/8	UNF 7/8-14	22,225	125	18	78	18	14,5	17	4
	P23569-UNF1	UNF 1"-12	25,4	140	20	93	18	14,5	17	5
	P23569-UNF1.1/8	UNF 1.1/8-12	28,575	150	20	85	22	18	21	5
	P23569-UNF1.1/4	UNF 1.1/4-12	31,75	150	20	85	22	18	21	5
	P23569-UNF1.3/8	UNF 1.3/8-12	34,925	170	22	101	28	22	25	5
	P23569-UNF1.1/2	UNF 1.1/2-12	38,1	170	22	101	28	22	25	5

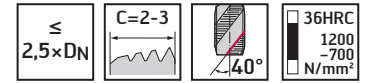
B5

HSS-E machine taps

Paradur® X-pert M



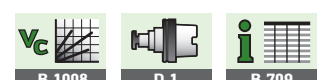
– For long-chipping materials



	P	M	K	N	S	H	O
TIN	●	●●	■	■	■	■	■
VAP	●	●●	■	■	■	■	■

DIN 2184-1	Designation TIN	Designation VAP	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	M2351305-UNF6	M23513-UNF6	UNF 6-40	3,505	56	6,5	20	4	3	6	3
	M2351305-UNF8	M23513-UNF8	UNF 8-36	4,166	63	7	21	4,5	3,4	6	3
	M2351305-UNF10	M23513-UNF10	UNF 10-32	4,826	70	8	25	6	4,9	8	3
	M2351305-UNF12	M23513-UNF12	UNF 12-28	5,486	80	10	30	6	4,9	8	3
	M2351305-UNF1/4	M23513-UNF1/4	UNF 1/4-28	6,35	80	10	30	7	5,5	8	3

DIN 2184-1	Designation TIN	Designation VAP	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	M2356305-UNF5/16	M23563-UNF5/16	UNF 5/16-24	7,938	90	12	67	6	4,9	8	3
	M2356305-UNF3/8	M23563-UNF3/8	UNF 3/8-24	9,525	100	15	77	7	5,5	8	3
	M2356305-UNF7/16	M23563-UNF7/16	UNF 7/16-20	11,113	100	15	76	8	6,2	9	3
	M2356305-UNF1/2	M23563-UNF1/2	UNF 1/2-20	12,7	100	13	73	9	7	10	4
	M2356305-UNF9/16	M23563-UNF9/16	UNF 9/16-18	14,288	100	15	71	11	9	12	4
	M2356305-UNF5/8	M23563-UNF5/8	UNF 5/8-18	15,875	100	15	58	12	9	12	4
	M2356305-UNF3/4	M23563-UNF3/4	UNF 3/4-16	19,05	110	17	66	14	11	14	4
	M2356305-UNF7/8	M23563-UNF7/8	UNF 7/8-14	22,225	125	18	78	18	14,5	17	4
	M2356305-UNF1	M23563-UNF1	UNF 1"-12	25,4	140	20	93	18	14,5	17	5

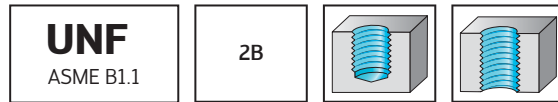
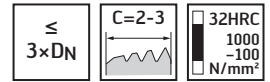


HSS-E-PM machine taps

Paradur® Eco CI

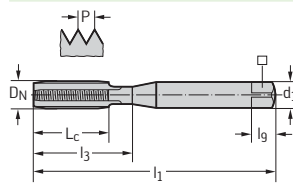


- For short-chipping materials
- Nitrided



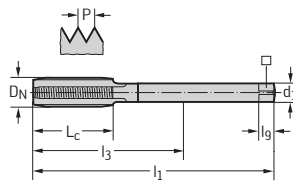
	P	M	K	N	S	H	O
NID			●●	●●			●●

DIN 2184-1



Designation NID	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
E23314-UNF6	UNF 6-40	3,505	56	11	20	4	3	6	3
E23314-UNF8	UNF 8-36	4,166	63	12	21	4,5	3,4	6	3
E23314-UNF10	UNF 10-32	4,826	70	13	25	6	4,9	8	4
E23314-UNF1/4	UNF 1/4-28	6,35	80	15	30	7	5,5	8	4

DIN 2184-1



Designation NID	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
E23364-UNF5/16	UNF 5/16-24	7,938	90	18	67	6	4,9	8	4
E23364-UNF3/8	UNF 3/8-24	9,525	100	20	77	7	5,5	8	4
E23364-UNF7/16	UNF 7/16-20	11,113	100	20	76	8	6,2	9	4
E23364-UNF1/2	UNF 1/2-20	12,7	100	21	73	9	7	10	4
E23364-UNF9/16	UNF 9/16-18	14,288	100	21	71	11	9	12	4
E23364-UNF5/8	UNF 5/8-18	15,875	100	21	58	12	9	12	4
E23364-UNF3/4	UNF 3/4-16	19,05	110	24	66	14	11	14	4
E23364-UNF7/8	UNF 7/8-14	22,225	125	24	78	18	14,5	17	5

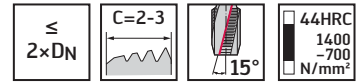
B5

HSS-E-PM machine taps

Paradur® Ti



– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●●			●	●●		

~DIN 2184-1		Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
		234164-UNF10	UNF 10-32	4,826	70	16	16	6	4,9	8	3
		234164-UNF1/4	UNF 1/4-28	6,35	80	15	25	7	5,5	8	3
		234164-UNF5/16	UNF 5/16-24	7,938	90	18	29,5	8	6,2	9	3
		234164-UNF3/8	UNF 3/8-24	9,525	100	20	33,5	10	8	11	3

≤ UNF 10: Without reduced neck after the thread

DIN 2184-1		Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
		234664-UNF7/16	UNF 7/16-20	11,113	100	20	76	8	6,2	9	4
		234664-UNF1/2	UNF 1/2-20	12,7	100	23	73	9	7	10	4
		234664-UNF5/8	UNF 5/8-18	15,875	100	25	58	12	9	12	4

B5

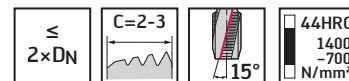
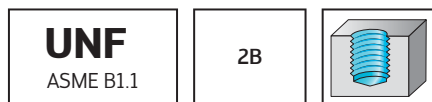


HSS-E-PM machine taps

Paradur® Ti



– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●●			●	●●		

~DIN 2184-1										
	Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	23416-UNF6	UNF 6-40	3,505	56	12	35	4	3	6	3
	23416-UNF8	UNF 8-36	4,166	63	13	13	4,5	3,4	6	3
	23416-UNF10	UNF 10-32	4,826	70	16	16	6	4,9	8	3
	23416-UNF12	UNF 12-28	5,486	80	15	23	6	4,9	8	3
	23416-UNF1/4	UNF 1/4-28	6,35	80	15	25	7	5,5	8	3
	23416-UNF5/16	UNF 5/16-24	7,938	90	18	29,5	8	6,2	9	3
	23416-UNF3/8	UNF 3/8-24	9,525	100	20	33,5	10	8	11	3

≤ UNF 10: Without reduced neck after the thread

DIN 2184-1										
	Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	23466-UNF7/16	UNF 7/16-20	11,113	100	20	76	8	6,2	9	4
	23466-UNF1/2	UNF 1/2-20	12,7	100	23	73	9	7	10	4
	23466-UNF5/8	UNF 5/8-18	15,875	100	25	58	12	9	12	4

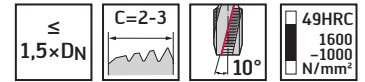
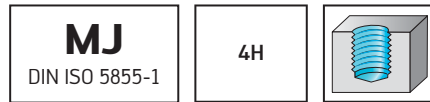


HSS-E-PM machine taps

Paradur® Ni 10



- Rounded thread crest
- For long-chipping and short-chipping materials



	P	M	K	N	S	H	O
Uncoated	●●			●	●●		

~DIN 371

Designation	D_N	P	l_1	L_c	l_3	d_1		l_9	N
Uncoated		mm	mm	mm	mm	mm	mm	mm	
2041014-MJ3	MJ 3	0,5	56	8	35	3,5	2,7	6	3
2041014-MJ4	MJ 4	0,7	63	10,5	42	4,5	3,4	6	3
2041014-MJ5	MJ 5	0,8	70	13	47	6	4,9	8	3
2041014-MJ6	MJ 6	1	80	15,5	57	6	4,9	8	3

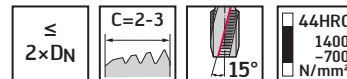
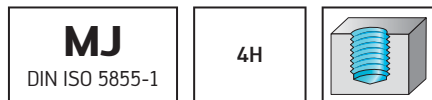
Without reduced neck after the thread

HSS-E-PM machine taps

Paradur® Ti



- Rounded thread crest
- For long-chipping materials

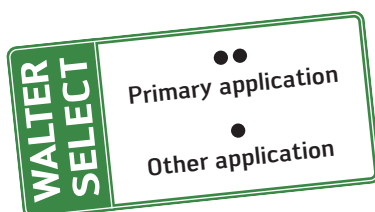


	P	M	K	N	S	H	O
Uncoated	●●			●	●●		

~DIN 371										
	Designation	DN	P	l ₁	L _c	l ₃	d ₁		l ₉	N
	Uncoated		mm	mm	mm	mm	h9 mm	mm	mm	
	204164-MJ3	MJ 3	0,5	56	10	10	3,5	2,7	6	3
	204164-MJ4	MJ 4	0,7	63	13	13	4,5	3,4	6	3
	204164-MJ5	MJ 5	0,8	70	16	16	6	4,9	8	3
	204164-MJ6	MJ 6	1	80	15	23	6	4,9	8	3
	204164-MJ8	MJ 8	1,25	90	18	29,5	8	6,2	9	3
	204164-MJ10	MJ 10	1,5	100	20	33,5	10	8	11	3

≤ MJ 5: Without reduced neck after the thread

B5

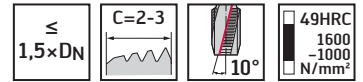


HSS-E-PM machine taps

Paradur® Ni 10



- Rounded thread crest
- For long-chipping and short-chipping materials



	P	M	K	N	S	H	O
Uncoated	●●			●	●●		

~DIN 2184-1		Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	224101-UNJC4	UNJC 4-40		2,845	56	8	35	3,5	2,7	6	3
	224101-UNJC6	UNJC 6-32		3,505	56	10	35	4	3	6	3
	224101-UNJC8	UNJC 8-32		4,166	63	11	42	4,5	3,4	6	3
	224101-UNJC10	UNJC 10-24		4,826	70	13,5	47	6	4,9	8	3
	224101-UNJC1/4	UNJC 1/4-20		6,35	80	17,5	57	7	5,5	8	3
	224101-UNJC5/16	UNJC 5/16-18		7,938	90	21	66	8	6,2	9	3
	224101-UNJC3/8	UNJC 3/8-16		9,525	100	25	72	10	8	11	3

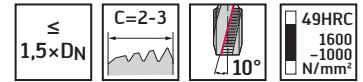
≤ UNC 10: Without reduced neck after the thread

HSS-E-PM machine taps

Paradur® Ni 10



- Rounded thread crest
- For long-chipping and short-chipping materials

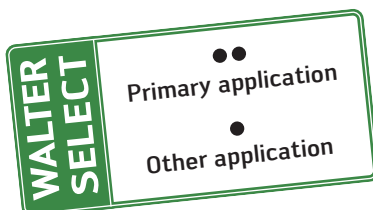


	P	M	K	N	S	H	O
Uncoated	●●			●	●●		

~DIN 2184-1		Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	234101-UNJF6	UNJF 6-40		3,505	56	9,5	35	4	3	6	3
	234101-UNJF8	UNJF 8-36		4,166	63	11	42	4,5	3,4	6	3
	234101-UNJF10	UNJF 10-32		4,826	70	12,5	47	6	4,9	8	3
	234101-UNJF1/4	UNJF 1/4-28		6,35	80	16	57	7	5,5	8	3
	234101-UNJF5/16	UNJF 5/16-24		7,938	90	20	66	8	6,2	9	3
	234101-UNJF3/8	UNJF 3/8-24		9,525	100	23	72	10	8	11	3

≤ UNJF 10: Without reduced neck after the thread

B5

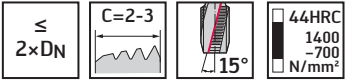


HSS-E-PM machine taps

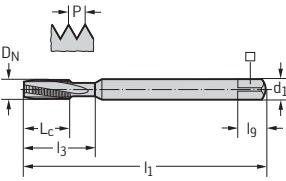
Paradur® Ti Plus



- Rounded thread crest
- For long-chipping materials



	P	M	K	N	S	H	O
ACN					●●		

~DIN 2184-1										
	Designation ACN	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	 mm	l _g mm	N
	2340663-UNJF10	UNJF 10-32	4,826	70	16	16	6	4,9	8	3
	2340663-UNJF1/4	UNJF 1/4-28	6,35	80	15	25	7	5,5	8	3
	2340663-UNJF5/16	UNJF 5/16-24	7,938	90	18	29,5	8	6,2	9	3
	2340663-UNJF3/8	UNJF 3/8-24	9,525	100	20	33,5	10	8	11	3

UNJF 10: Without reduced neck after the thread

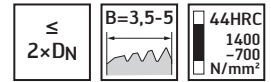
B5

HSS-E-PM machine taps

Prototex® TiNi Plus



- Rounded thread crest
- For long-chipping materials

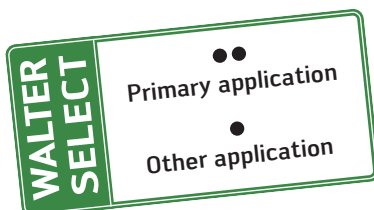


	P	M	K	N	S	H	O
ACN					●●		

~DIN 2184-1										
	Designation ACN	D _N -P	D _N mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	□ mm	l _g mm	N
	2320763-UNJF10	UNJF 10-32	4,826	70	16	16	6	4,9	8	3
	2320763-UNJF1/4	UNJF 1/4-28	6,35	80	15	25	7	5,5	8	3
	2320763-UNJF5/16	UNJF 5/16-24	7,938	90	18	29,5	8	6,2	9	3
	2320763-UNJF3/8	UNJF 3/8-24	9,525	100	20	33,5	10	8	11	3

UNJF 10: Without reduced neck after the thread

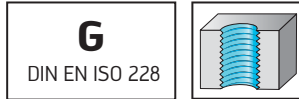
B5



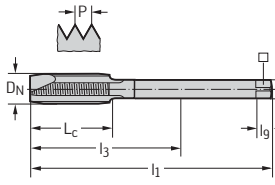
HSS-E-PM machine taps Prototex® Eco Plus



– For long-chipping materials



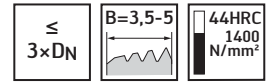
	P	M	K	N	S	H	O
THL	●	●	●	●			

DIN 5156											
	Designation THL	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
	EP2426302-G1/8	G 1/8-28	9,728	28	90	20	67	7	5,5	8	3
	EP2426302-G1/4	G 1/4-19	13,157	19	100	21	71	11	9	12	4
	EP2426302-G3/8	G 3/8-19	16,662	19	100	21	58	12	9	12	4
	EP2426302-G1/2	G 1/2-14	20,955	14	125	24	80	16	12	15	4
	EP2426302-G5/8	G 5/8-14	22,911	14	125	24	78	18	14,5	17	4
	EP2426302-G3/4	G 3/4-14	26,441	14	140	26	77	20	16	19	5
	EP2426302-G1	G 1"-11	33,249	11	160	28	93	25	20	23	5

HSS-E machine taps Prototex® Synchrospeed



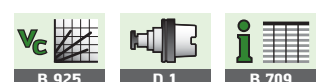
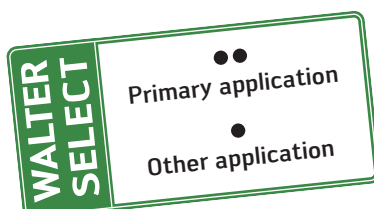
- For long-chipping materials
- Only for synchronous machining (rigid tapping)



	P	M	K	N	S	H	O
THL	●●	●●	●●	●●	●●	●●	●●

~DIN 5156											
	Designation THL	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	mm	l _g mm	N
	S2426302-G1/8	G 1/8-28	9,728	28	90	9	39	10	8	11	3
	S2426302-G1/4	G 1/4-19	13,157	19	100	13	46	14	11	14	3
	S2426302-G3/8	G 3/8-19	16,662	19	100	13	62,5	16	12	15	4
	S2426302-G1/2	G 1/2-14	20,955	14	125	18	50	20	16	19	4

B5



HSS-E machine taps

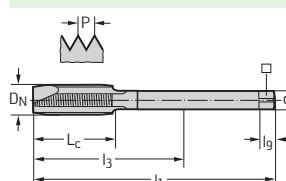
Prototex® X-pert P



– For long-chipping materials



	P	M	K	N	S	H	O
TIN	●●			●			●
Uncoated	●●			●			●

DIN 5156												
	Designation TIN	Designation Uncoated	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	N	
	P2436005-G1/8	P24360-G1/8	G 1/8-28	9,728	28	90	20	67	7	5,5	3	
	P2436005-G1/4	P24360-G1/4	G 1/4-19	13,157	19	100	21	71	11	9	3	
	P2436005-G3/8	P24360-G3/8	G 3/8-19	16,662	19	100	21	58	12	9	4	
	P2436005-G1/2	P24360-G1/2	G 1/2-14	20,955	14	125	24	80	16	12	4	
		P24360-G5/8	G 5/8-14	22,911	14	125	24	78	18	14,5	4	
	P2436005-G3/4	P24360-G3/4	G 3/4-14	26,441	14	140	26	77	20	16	4	
		P24360-G7/8	G 7/8-14	30,201	14	150	26	85	22	18	4	
	P2436005-G1	P24360-G1	G 1"-11	33,249	11	160	28	93	25	20	4	
		P24360-G1.1/4	G 1.1/4-11	41,91	11	170	28	72	32	24	4	
		P24360-G1.1/2	G 1.1/2-11	47,803	11	190	30	87	36	29	5	
		P24360-G1.3/4	G 1.3/4-11	53,746	11	190	32	60	40	32	5	
		P24360-G2	G 2"-11	59,614	11	220	34	87	45	35	5	

l_g dimension in accordance with DIN 10

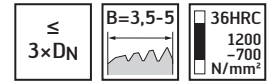
B5



HSS-E machine taps Prototex® X-pert M

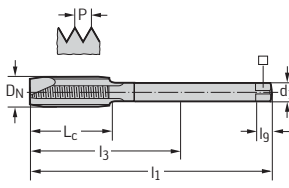


– For long-chipping materials



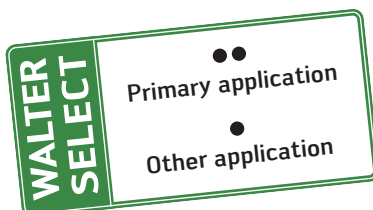
	P	M	K	N	S	H	O
TIN	●	●●					
VAP	●	●●					

DIN 5156



Designation TIN	Designation VAP	DN-P	DN mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
M2426305-G1/8	M24263-G1/8	G 1/8-28	9,728	28	90	20	67	7	5,5	8	3
M2426305-G1/4	M24263-G1/4	G 1/4-19	13,157	19	100	21	71	11	9	12	4
M2426305-G3/8	M24263-G3/8	G 3/8-19	16,662	19	100	21	58	12	9	12	4
M2426305-G1/2	M24263-G1/2	G 1/2-14	20,955	14	125	24	80	16	12	15	4
	M24263-G5/8	G 5/8-14	22,911	14	125	24	78	18	14,5	17	4
M2426305-G3/4	M24263-G3/4	G 3/4-14	26,441	14	140	26	77	20	16	19	4
M2426305-G1	M24263-G1	G 1"-11	33,249	11	160	28	93	25	20	23	5

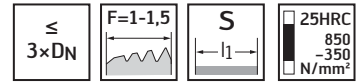
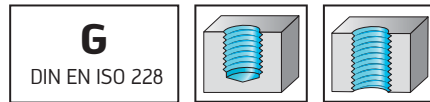
B5



HSS-E taps, short KMB Ms

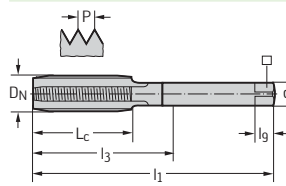


– For short-chipping materials



	P	M	K	N	S	H	O
Uncoated				●●			●

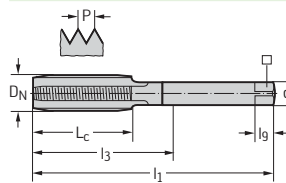
DIN 5157



Designation Uncoated	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
24165-G1/8	G 1/8-28	9,728	28	63	20	40	7	5,5	8	3
24165-G1/4	G 1/4-19	13,157	19	70	20	41	11	9	12	4
24165-G3/8	G 3/8-19	16,662	19	70	20	28	12	9	12	4
24165-G1/2	G 1/2-14	20,955	14	80	22	35	16	12	15	6
24165-G3/4	G 3/4-14	26,441	14	90	22	27	20	16	19	6
24165-G1	G 1"-11	33,249	11	100	25	33	25	20	23	6

Thread machining allowance 0.05 mm

DIN 5157



Designation Uncoated	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
24195-G1/8	G 1/8-28	9,728	28	63	20	40	7	5,5	8	3
24195-G1/4	G 1/4-19	13,157	19	70	20	41	11	9	12	4
24195-G3/8	G 3/8-19	16,662	19	70	20	28	12	9	12	4
24195-G1/2	G 1/2-14	20,955	14	80	22	35	16	12	15	6
24195-G3/4	G 3/4-14	26,441	14	90	22	27	20	16	19	6

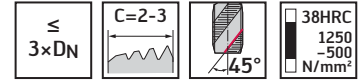
Thread machining allowance 0.1 mm

B5

HSS-E-PM machine taps Paradur® Eco Plus

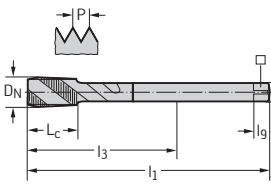


– For long-chipping materials



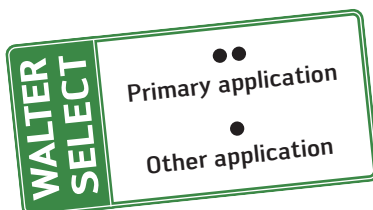
	P	M	K	N	S	H	O
THL	●	●	●	●			

DIN 5156



Designation THL	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
EP2456302-G1/8	G 1/8-28	9,728	28	90	12	67	7	5,5	8	3
EP2456302-G1/4	G 1/4-19	13,157	19	100	15	71	11	9	12	4
EP2456302-G3/8	G 3/8-19	16,662	19	100	15	58	12	9	12	4
EP2456302-G1/2	G 1/2-14	20,955	14	125	18	80	16	12	15	4
EP2456302-G5/8	G 5/8-14	22,911	14	125	18	78	18	14,5	17	4
EP2456302-G1	G 1"-11	33,249	11	160	22	93	25	20	23	5

B5

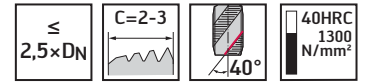


HSS-E machine taps

Paradur® Synchrospeed



- For long-chipping materials
- Only for synchronous machining (rigid tapping)



	P	M	K	N	S	H	O
THL	●	●	●	●	●	●	●

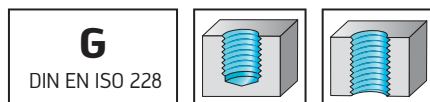
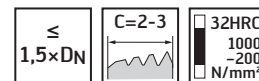
~DIN 5156											
	Designation THL	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	mm	l _g mm	N
	S2456302-G1/8	G 1/8-28	9,728	28	90	9,5	39	10	8	11	3
	S2456302-G1/4	G 1/4-19	13,157	19	100	14	46	14	11	14	3
	S2456302-G3/8	G 3/8-19	16,662	19	100	14	62,5	16	12	15	4
	S2456302-G1/2	G 1/2-14	20,955	14	125	19	50	20	16	19	4

HSS-E machine taps

Paradur® H

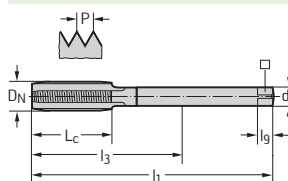


– For long and short-chipping materials



	P	M	K	N	S	H	O
Uncoated			●	●●			●

DIN 5156



Designation Uncoated	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
24361-G1/8	G 1/8-28	9,728	28	90	20	67	7	5,5	8	3
24361-G1/4	G 1/4-19	13,157	19	100	21	71	11	9	12	4
24361-G3/8	G 3/8-19	16,662	19	100	21	58	12	9	12	4
24361-G1/2	G 1/2-14	20,955	14	125	24	80	16	12	15	4
24361-G5/8	G 5/8-14	22,911	14	125	24	78	18	14,5	17	4
24361-G3/4	G 3/4-14	26,441	14	140	26	77	20	16	19	4
24361-G7/8	G 7/8-14	30,201	14	150	26	85	22	18	21	4
24361-G1	G 1"-11	33,249	11	160	28	93	25	20	23	4
24361-G1.1/4	G 1.1/4-11	41,91	11	170	28	72	32	24	27	4
24361-G1.1/2	G 1.1/2-11	47,803	11	190	30	87	36	29	32	6
24361-G2	G 2"-11	59,614	11	220	34	87	45	35	38	6
24361-G2.1/2	G 2.1/2-11	75,184	11	275	38	138	50	39	42	6

B5

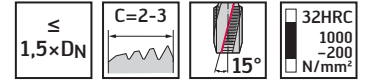
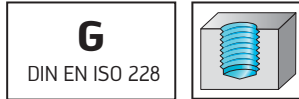


HSS-E machine taps

Paradur® N

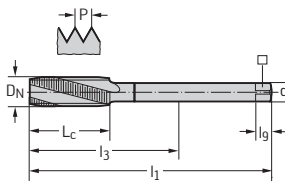


– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●●	●	●●	●●	●	●	●

DIN 5156

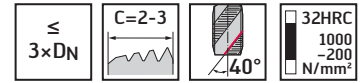


Designation Uncoated	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
24460-G1/8	G 1/8-28	9,728	28	90	20	67	7	5,5	8	3
24460-G1/4	G 1/4-19	13,157	19	100	21	71	11	9	12	4
24460-G3/8	G 3/8-19	16,662	19	100	21	58	12	9	12	4
24460-G1/2	G 1/2-14	20,955	14	125	24	80	16	12	15	4
24460-G3/4	G 3/4-14	26,441	14	140	26	77	20	16	19	4
24460-G1	G 1"-11	33,249	11	160	28	93	25	20	23	4

HSS-E machine taps Paradur® X-pert P

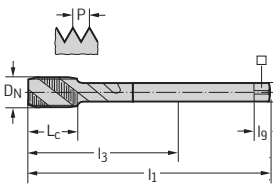


– For long-chipping materials



	P	M	K	N	S	H	O
TIN	●●			●			●
Uncoated	●●			●			●

DIN 5156



Designation TIN	Designation Uncoated	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
P2456905-G1/8	P24569-G1/8	G 1/8-28	9,728	28	90	12	67	7	5,5	8	3
P2456905-G1/4	P24569-G1/4	G 1/4-19	13,157	19	100	15	71	11	9	12	4
P2456905-G3/8	P24569-G3/8	G 3/8-19	16,662	19	100	15	58	12	9	12	4
P2456905-G1/2	P24569-G1/2	G 1/2-14	20,955	14	125	18	80	16	12	15	4
	P24569-G5/8	G 5/8-14	22,911	14	125	18	78	18	14,5	17	4
P2456905-G3/4	P24569-G3/4	G 3/4-14	26,441	14	140	20	77	20	16	19	5
	P24569-G7/8	G 7/8-14	30,201	14	150	20	85	22	18	21	5
P2456905-G1	P24569-G1	G 1"-11	33,249	11	160	22	93	25	20	23	5
	P24569-G1.1/8	G 1.1/8-11	37,897	11	170	22	101	28	22	25	5
	P24569-G1.1/4	G 1.1/4-11	41,91	11	170	22	72	32	24	27	6
	P24569-G1.1/2	G 1.1/2-11	47,803	11	190	24	87	36	29	32	6
	P24569-G1.3/4	G 1.3/4-11	53,746	11	190	26	60	40	32	35	6
	P24569-G2	G 2"-11	59,614	11	220	28	87	45	35	38	6

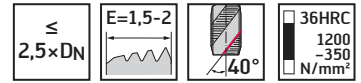
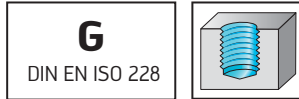


HSS-E machine taps

Paradur® STE

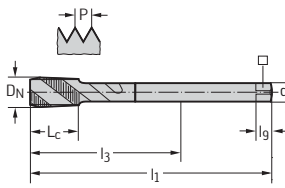


– For long-chipping materials



	P	M	K	N	S	H	O
THL	●	●	●	●	●	●	●
Uncoated	●	●	●	●	●	●	●

DIN 5156

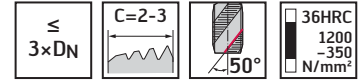


Designation THL	Designation Uncoated	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
2456062-G1/8	245606-G1/8	G 1/8-28	9,728	28	90	12	67	7	5,5	8	4
2456062-G1/4	245606-G1/4	G 1/4-19	13,157	19	100	15	71	11	9	12	5
2456062-G3/8	245606-G3/8	G 3/8-19	16,662	19	100	15	58	12	9	12	5
2456062-G1/2	245606-G1/2	G 1/2-14	20,955	14	125	18	80	16	12	15	5

B5

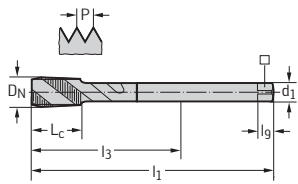


HSS-E machine taps TC142 Supreme



	P	M	K	N	S	H	O
WY80FC	●	●●					

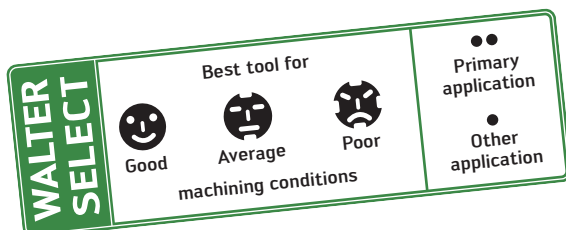
DIN 5156



Designation	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N	WY80FC
TC142-G1/8-L0-	G 1/8-28	9,728	28	90	12	67	7	5,5	8	3	●
TC142-G1/4-L0-	G 1/4-19	13,157	19	100	15	71	11	9	12	4	●

Ordering example for the WY80FC grade: TC142-G1/8-L0-WY80FC

B5

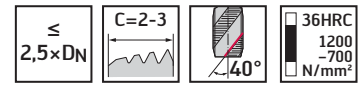


HSS-E machine taps

Paradur® X-pert M

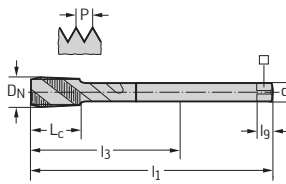


– For long-chipping materials



	P	M	K	N	S	H	O
TIN	●	●●					
VAP	●	●●					

DIN 5156



Designation TIN	Designation VAP	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
M2456305-G1/8	M24563-G1/8	G 1/8-28	9,728	28	90	12	67	7	5,5	8	3
M2456305-G1/4	M24563-G1/4	G 1/4-19	13,157	19	100	15	71	11	9	12	4
M2456305-G3/8	M24563-G3/8	G 3/8-19	16,662	19	100	15	58	12	9	12	4
M2456305-G1/2	M24563-G1/2	G 1/2-14	20,955	14	125	18	80	16	12	15	4
	M24563-G5/8	G 5/8-14	22,911	14	125	18	78	18	14,5	17	4
M2456305-G3/4	M24563-G3/4	G 3/4-14	26,441	14	140	20	77	20	16	19	5
	M24563-G7/8	G 7/8-14	30,201	14	150	20	85	22	18	21	5
M2456305-G1	M24563-G1	G 1"-11	33,249	11	160	22	93	25	20	23	5

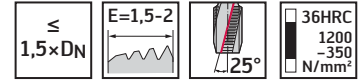
B5



HSS-E machine taps Paradur Inox® 25

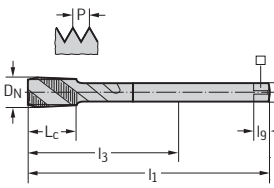


– For long-chipping materials



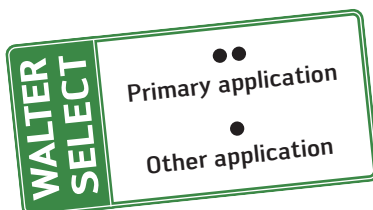
	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●

DIN 5156



Designation TIN	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
2456315-G1/4	G 1/4-19	13,157	19	100	18	71	11	9	12	5
2456315-G3/8	G 3/8-19	16,662	19	100	22	58	12	9	12	5
2456315-G1/2	G 1/2-14	20,955	14	125	25	80	16	12	15	6
2456315-G3/4	G 3/4-14	26,441	14	140	28	77	20	16	19	6

B5

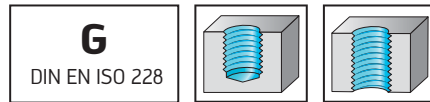
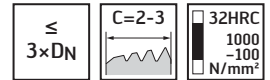


HSS-E-PM machine taps

Paradur® Eco CI

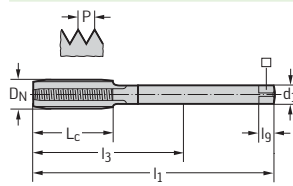


- For short-chipping materials
- Nitrided



	P	M	K	N	S	H	O
TICN			●●	●●			●●
NID			●●	●●			●●

DIN 5156

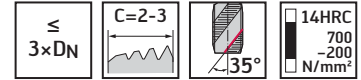


Designation TICN	Designation NID	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
E2436406-G1/8	E24364-G1/8	G 1/8-28	9,728	28	90	20	67	7	5,5	8	4
E2436406-G1/4	E24364-G1/4	G 1/4-19	13,157	19	100	21	71	11	9	12	4
E2436406-G3/8	E24364-G3/8	G 3/8-19	16,662	19	100	21	58	12	9	12	5
E2436406-G1/2	E24364-G1/2	G 1/2-14	20,955	14	125	24	80	16	12	15	5
E2436406-G3/4	E24364-G3/4	G 3/4-14	26,441	14	140	26	77	20	16	19	6
E2436406-G1	E24364-G1	G 1"-11	33,249	11	160	28	93	25	20	23	6
E2436406-G1.1/4	E24364-G1.1/4	G 1.1/4-11	41,91	11	170	28	72	32	24	27	6
E2436406-G1.1/2	E24364-G1.1/2	G 1.1/2-11	47,803	11	190	30	87	36	29	32	6

HSS-E machine taps Paradur® X-pert N

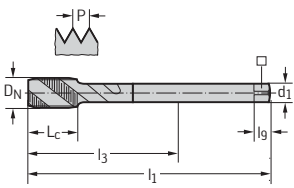


– For long-chipping materials



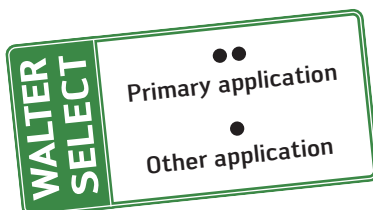
	P	M	K	N	S	H	O
Uncoated				●●	●		●

DIN 5156



Designation Uncoated	DN-P	DN mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
N24566-G1/8	G 1/8-28	9,728	28	90	12	67	7	5,5	8	3

B5

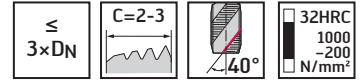


HSS-E machine taps

Paradur® Uni

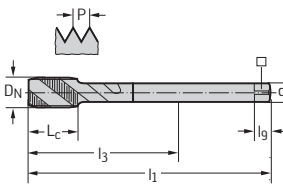


– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●●		●	●			

DIN 5156



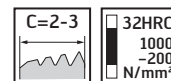
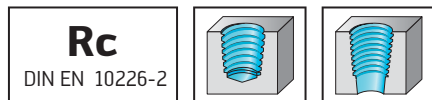
Designation Uncoated	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
7456770-G1/8	G 1/8-28	9,728	28	90	12	67	7	5,5	8	3
7456770-G1/4	G 1/4-19	13,157	19	100	15	71	11	9	12	4
7456770-G3/8	G 3/8-19	16,662	19	100	15	58	12	9	12	4
7456770-G1/2	G 1/2-14	20,955	14	125	18	80	16	12	15	4
7456770-G5/8	G 5/8-14	22,911	14	125	18	78	18	14,5	17	5
7456770-G3/4	G 3/4-14	26,441	14	140	20	77	20	16	19	5
7456770-G1	G 1"-11	33,249	11	160	22	93	25	20	23	5

HSS-E machine taps

Paradur® H

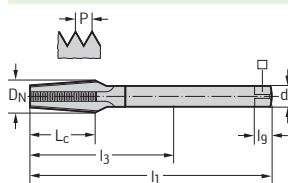


– For long and short-chipping materials



	P	M	K	N	S	H	O
Uncoated			●	●●			●

PROTOTYP TOOLS STANDARD



Designation Uncoated	DN-P	DN mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
24167-RC1/8	Rc 1/8-28	9,728	28	90	13	67	7	5,5	6	4
24167-RC1/4	Rc 1/4-19	13,157	19	100	20	71	11	9	9	4
24167-RC3/8	Rc 3/8-19	16,662	19	110	20	68	12	9	9	4
24167-RC1/2	Rc 1/2-14	20,955	14	125	26	80	16	12	12	5
24167-RC3/4	Rc 3/4-14	26,441	14	140	26	77	20	16	16	5
24167-RC1	Rc 1"-11	33,249	11	150	32	83	25	20	20	5
24167-RC1.1/4	Rc 1.1/4-11	41,91	11	160	32	62	32	24	24	6
24167-RC1.1/2	Rc 1.1/2-11	47,803	11	180	32	77	36	29	29	6

Taper ratio 1:16

B5

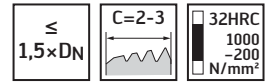
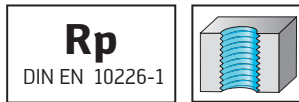


HSS-E machine taps

Paradur® H



– For long and short-chipping materials



	P	M	K	N	S	H	O
Uncoated			●	●●			●

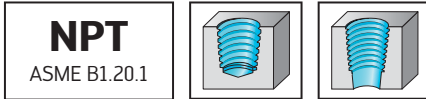
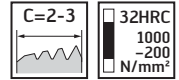
DIN 5156	Designation Uncoated	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	243612-RP1/8	Rp 1/8-28	9,728	28	90	20	67	7	5,5	8	3
	243612-RP1/4	Rp 1/4-19	13,157	19	100	21	71	11	9	12	4
	243612-RP3/8	Rp 3/8-19	16,662	19	100	21	58	12	9	12	4
	243612-RP1/2	Rp 1/2-14	20,955	14	125	24	80	16	12	15	4
	243612-RP3/4	Rp 3/4-14	26,441	14	140	26	77	20	16	19	4
	243612-RP1	Rp 1"-11	33,249	11	160	28	93	25	20	23	4
	243612-RP1.1/2	Rp 1.1/2-11	47,803	11	190	30	87	36	29	32	6

HSS-E machine taps

Paradur® H

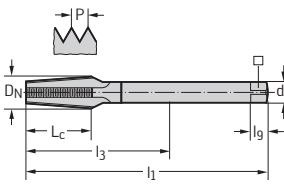


– For long-chipping and short-chipping materials



	P	M	K	N	S	H	O
Uncoated			●	●●			●

PROTOTYP TOOLS STANDARD



Designation Uncoated	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
25167-NPT1/16	NPT 1/16-27	7,717	27	80	14	56	8	6,2	6	3
25167-NPT1/8	NPT 1/8-27	10,065	27	90	14	61	11	9	9	3
25167-NPT1/4	NPT 1/4-18	13,372	18	100	20	56	14	11	11	3
25167-NPT3/8	NPT 3/8-18	16,812	18	110	20	65	16	12	12	4
25167-NPT1/2	NPT 1/2-14	20,947	14	125	26	78	18	14,5	15	4
25167-NPT3/4	NPT 3/4-14	26,292	14	140	26	75	22	18	18	5
25167-NPT1	NPT 1"-11.5	32,914	12	150	31	81	28	22	22	5
25167-NPT1.1/4	NPT 1.1/4-11.5	41,67	12	160	31	62	32	24	24	5
25167-NPT1.1/2	NPT 1.1/2-11.5	47,74	12	160	31	57	36	29	29	6
25167-NPT2	NPT 2"-11.5	59,778	12	180	31	47	45	35	35	7

Taper ratio 1:16

B5

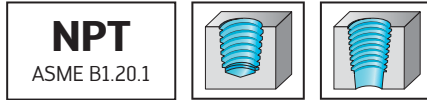


HSS-E machine taps

Paradur® N

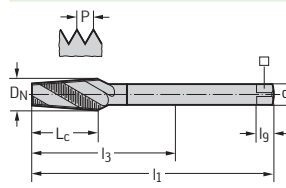


– For long-chipping materials



	P	M	K	N	S	H	O
VAP	●●		●●	●●			

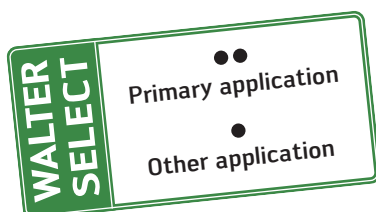
PROTOTYP TOOLS STANDARD



Designation VAP	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
25460-NPT1/16	NPT 1/16-27	7,717	27	80	14	56	8	6,2	6	3
25460-NPT1/8	NPT 1/8-27	10,065	27	90	14	61	11	9	9	3
25460-NPT1/4	NPT 1/4-18	13,372	18	100	20	56	14	11	11	3
25460-NPT3/8	NPT 3/8-18	16,812	18	110	20	65	16	12	12	4
25460-NPT1/2	NPT 1/2-14	20,947	14	125	26	78	18	14,5	15	4
25460-NPT3/4	NPT 3/4-14	26,292	14	140	26	75	22	18	18	5
25460-NPT1	NPT 1"-11.5	32,914	12	150	31	81	28	22	22	5

Taper ratio 1:16

B5

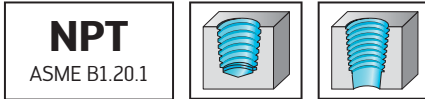


HSS-E machine taps

Paradur Inox®

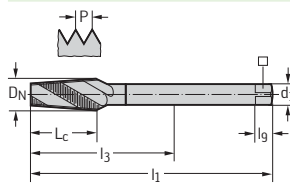


– For long-chipping materials



	P	M	K	N	S	H	O
THL	●	●	●	●	●	●	●
VAP	●	●	●	●	●	●	●

PROTOTYP TOOLS STANDARD



Designation THL	Designation VAP	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
2556702-NPT1/16	25567-NPT1/16	NPT 1/16-27	7,717	27	80	14	56	8	6,2	6	3
2556702-NPT1/8	25567-NPT1/8	NPT 1/8-27	10,065	27	90	14	61	11	9	9	4
2556702-NPT1/4	25567-NPT1/4	NPT 1/4-18	13,372	18	100	20	56	14	11	11	4
2556702-NPT3/8	25567-NPT3/8	NPT 3/8-18	16,812	18	110	20	65	16	12	12	5
2556702-NPT1/2	25567-NPT1/2	NPT 1/2-14	20,947	14	125	26	78	18	14,5	15	5
	25567-NPT3/4	NPT 3/4-14	26,292	14	140	26	75	22	18	18	5
	25567-NPT1	NPT 1"-11.5	32,914	12	150	31	81	28	22	22	5

Taper ratio 1:16

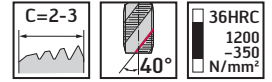
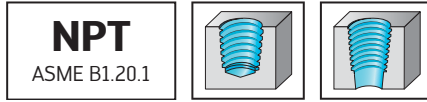
B5

HSS-E machine taps

Paradur Inox® 40

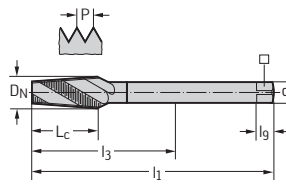


– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●	●	●	●			

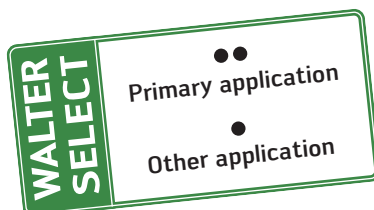
PROTOTYP TOOLS STANDARD



Designation Uncoated	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
255630-NPT1/8	NPT 1/8-27	10,065	27	90	14	61	11	9	9	3
255630-NPT1/4	NPT 1/4-18	13,372	18	100	20	56	14	11	11	3
255630-NPT3/8	NPT 3/8-18	16,812	18	110	20	65	16	12	12	4
255630-NPT1/2	NPT 1/2-14	20,947	14	125	26	78	18	14,5	15	4

Taper ratio 1:16

B5

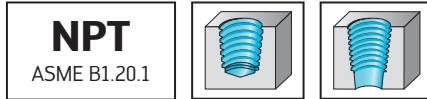


HSS-E machine taps

Paradur® Ni

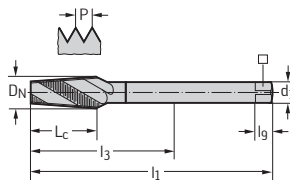


– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●				●●		

PROTOTYP TOOLS STANDARD



Designation Uncoated	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
25467-NPT1/16	NPT 1/16-27	7,717	27	80	14	56	8	6,2	6	3
25467-NPT1/8	NPT 1/8-27	10,065	27	90	14	61	11	9	9	4
25467-NPT1/4	NPT 1/4-18	13,372	18	100	20	56	14	11	11	4
25467-NPT3/8	NPT 3/8-18	16,812	18	110	20	65	16	12	12	5
25467-NPT1/2	NPT 1/2-14	20,947	14	125	26	78	18	14,5	15	5
25467-NPT3/4	NPT 3/4-14	26,292	14	140	26	75	22	18	18	5
25467-NPT1	NPT 1"-11.5	32,914	12	150	31	81	28	22	22	5

Taper ratio 1:16

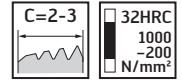
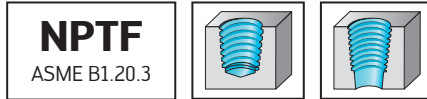
B5

HSS-E machine taps

Paradur® H

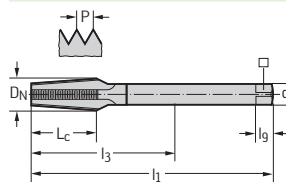


– For long-chipping and short-chipping materials



	P	M	K	N	S	H	O
Uncoated			●	●●			●

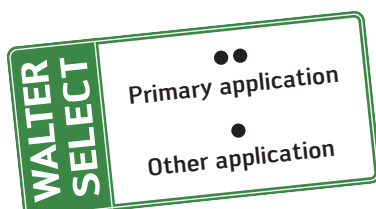
PROTOTYP TOOLS STANDARD



Designation Uncoated	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
26167-NPTF1/16	NPTF 1/16-27	7,635	27	80	14	56	8	6,2	6	3
26167-NPTF1/8	NPTF 1/8-27	9,982	27	90	14	61	11	9	9	3
26167-NPTF1/4	NPTF 1/4-18	13,313	18	100	20	56	14	11	11	3
26167-NPTF3/8	NPTF 3/8-18	16,752	18	110	20	65	16	12	12	4
26167-NPTF1/2	NPTF 1/2-14	20,921	14	125	26	78	18	14,5	15	4
26167-NPTF3/4	NPTF 3/4-14	26,267	14	140	26	75	22	18	18	5
26167-NPTF1	NPTF 1"-11.5	32,839	12	150	31	81	28	22	22	5

Taper ratio 1:16

B5

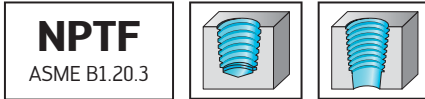


HSS-E machine taps

Paradur® N

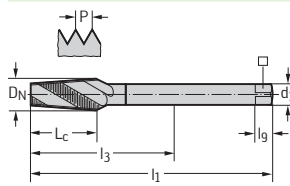


– For long-chipping materials



	P	M	K	N	S	H	O
VAP	●●		●●	●●			

PROTOTYP TOOLS STANDARD



Designation VAP	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
26460-NPTF1/16	NPTF 1/16-27	7,635	27	80	14	56	8	6,2	6	3
26460-NPTF1/8	NPTF 1/8-27	9,982	27	90	14	61	11	9	9	3
26460-NPTF1/4	NPTF 1/4-18	13,313	18	100	20	56	14	11	11	3
26460-NPTF3/8	NPTF 3/8-18	16,752	18	110	20	65	16	12	12	4
26460-NPTF1/2	NPTF 1/2-14	20,921	14	125	26	78	18	14,5	15	4
26460-NPTF3/4	NPTF 3/4-14	26,267	14	140	26	75	22	18	18	5

Taper ratio 1:16

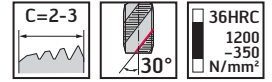
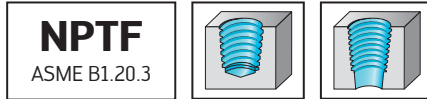
B5

HSS-E machine taps

Paradur Inox®

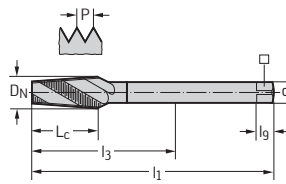


– For long-chipping materials



	P	M	K	N	S	H	O
VAP	●●	●●	●				

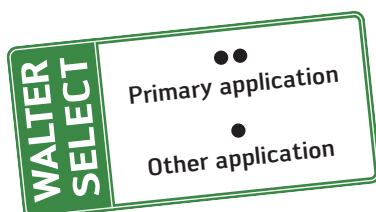
PROTOTYP TOOLS STANDARD



Designation VAP	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
26567-NPTF1/16	NPTF 1/16-27	7,635	27	80	14	56	8	6,2	6	3
26567-NPTF1/8	NPTF 1/8-27	9,982	27	90	14	61	11	9	9	4
26567-NPTF1/4	NPTF 1/4-18	13,313	18	100	20	56	14	11	11	4
26567-NPTF1/2	NPTF 1/2-14	20,921	14	125	26	78	18	14,5	15	5

Taper ratio 1:16

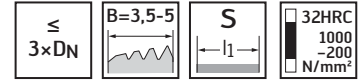
B5



HSS-E taps, short KMB H



– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

DIN 40 432											
	Designation Uncoated	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	27160-PG7	Pg 7-20	12,5	20	70	20	43	9	7	10	4
	27160-PG9	Pg 9-18	15,2	18	70	20	28	12	9	12	4
	27160-PG11	Pg 11-18	18,6	18	80	22	36	14	11	14	4
	27160-PG13.5	Pg 13.5-18	20,4	18	80	22	35	16	12	15	4
	27160-PG16	Pg 16-18	22,5	18	80	22	33	18	14,5	17	4
	27160-PG21	Pg 21-16	28,3	16	90	22	25	22	18	21	4

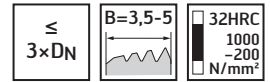
B5

HSS-E machine taps

Prototex® X-pert P



– For long-chipping materials

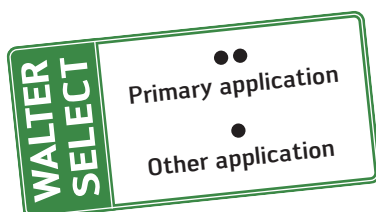


	P	M	K	N	S	H	O
Uncoated	●●			●			●

DIN 2184-1		Designation Uncoated	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	P28210-BSW1/8	BSW 1/8-40		3,175	40	56	10	18	3,5	2,7	6	2
	P28210-BSW3/16	BSW 3/16-24		4,763	24	70	13	25	6	4,9	8	2
	P28210-BSW1/4	BSW 1/4-20		6,35	20	80	15	30	7	5,5	8	3
	P28210-BSW5/16	BSW 5/16-18		7,938	18	90	18	35	8	6,2	9	3
	P28210-BSW3/8	BSW 3/8-16		9,525	16	100	20	39	10	8	11	3

DIN 2184-1		Designation Uncoated	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	P28360-BSW7/16	BSW 7/16-14		11,113	14	100	20	76	8	6,2	9	3
	P28360-BSW1/2	BSW 1/2-12		12,7	12	110	23	83	9	7	10	3
	P28360-BSW5/8	BSW 5/8-11		15,875	11	110	25	68	12	9	12	3
	P28360-BSW3/4	BSW 3/4-10		19,05	10	125	30	81	14	11	14	4
	P28360-BSW7/8	BSW 7/8-9		22,225	9	140	30	93	18	14,5	17	4
	P28360-BSW1	BSW 1"-8		25,4	8	160	36	113	18	14,5	17	4

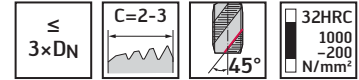
B5



HSS-E machine taps Paradur® X-pert P



– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

DIN 2184-1											
	Designation Uncoated	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	P28519-BSW1/8	BSW 1/8-40	3,175	40	56	6	18	3,5	2,7	6	3
	P28519-BSW3/16	BSW 3/16-24	4,763	24	70	8	25	6	4,9	8	3
	P28519-BSW1/4	BSW 1/4-20	6,35	20	80	10	30	7	5,5	8	3
	P28519-BSW5/16	BSW 5/16-18	7,938	18	90	12	35	8	6,2	9	3
	P28519-BSW3/8	BSW 3/8-16	9,525	16	100	15	39	10	8	11	3

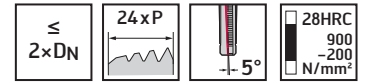
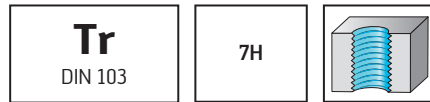
DIN 2184-1											
	Designation Uncoated	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	P28569-BSW7/16	BSW 7/16-14	11,113	14	100	15	76	8	6,2	9	3
	P28569-BSW1/2	BSW 1/2-12	12,7	12	110	18	83	9	7	10	3
	P28569-BSW5/8	BSW 5/8-11	15,875	11	110	20	68	12	9	12	4
	P28569-BSW3/4	BSW 3/4-10	19,05	10	125	25	81	14	11	14	4
	P28569-BSW7/8	BSW 7/8-9	22,225	9	140	25	93	18	14,5	17	4
	P28569-BSW1	BSW 1"-8	25,4	8	160	30	113	18	14,5	17	4

HSS-E trapezoidal taps

TMB

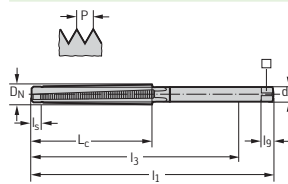


- Left-hand helix
- For long-chipping and short-chipping materials



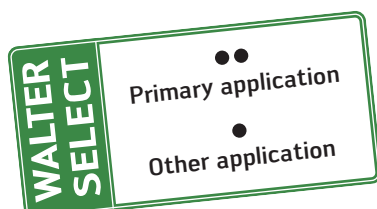
	P	M	K	N	S	H	O
Uncoated	●●	●●	●●	●●	●●	●●	●●

PROTOTYP TOOLS STANDARD



Designation Uncoated	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	mm	l_9 mm	N
29100-TR8X1.5	Tr 8x1.5	1,5	90	45	67	6	4,9	8	3
29100-TR10X2	Tr 10x2	2	135	60	112	7	5,5	8	3
29100-TR10X3	Tr 10x3	3	145	90	122	7	5,5	8	3
29100-TR12X3	Tr 12x3	3	175	90	151	8	6,2	9	3
29100-TR14X3	Tr 14x3	3	180	90	152	10	8	11	3
29100-TR14X4	Tr 14x4	4	215	120	187	10	8	11	3
29100-TR16X4	Tr 16x4	4	220	120	191	11	9	12	3
29100-TR18X4	Tr 18x4	4	225	120	183	12	9	12	3
29100-TR20X4	Tr 20x4	4	230	120	186	14	11	14	3
29100-TR22X5	Tr 22x5	5	265	150	220	16	12	15	3
29100-TR24X5	Tr 24x5	5	275	150	228	18	14,5	17	3
29100-TR26X5	Tr 26x5	5	295	150	232	20	16	19	3
29100-TR28X5	Tr 28x5	5	285	150	220	22	18	21	3

B5



HSS-E trapezoidal taps

TMB

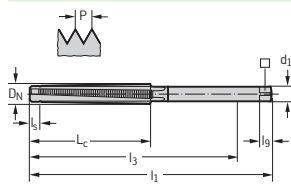


- Right-hand helix
- For long-chipping and short-chipping materials



	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

PROTOTYP TOOLS STANDARD

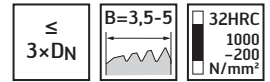
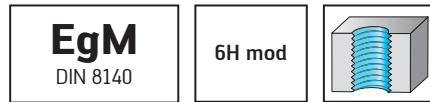


Designation Uncoated	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	l_9 mm	N
29900-TR10X2	Tr 10x2 - LH	2	135	60	112	7	5,5	3
29900-TR12X3	Tr 12x3 - LH	3	175	90	151	8	6,2	3
29900-TR14X4	Tr 14x4 - LH	4	215	120	187	10	8	3
29900-TR16X4	Tr 16x4 - LH	4	220	120	191	11	9	3
29900-TR18X4	Tr 18x4 - LH	4	225	120	183	12	9	3
29900-TR20X4	Tr 20x4 - LH	4	230	120	186	14	11	3
29900-TR22X5	Tr 22x5 - LH	5	265	150	220	16	12	3
29900-TR24X5	Tr 24x5 - LH	5	275	150	228	18	14,5	3
29900-TR26X5	Tr 26x5 - LH	5	295	150	232	20	16	3

HSS-E machine taps – Insert Prototex® X-pert P



– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

DIN 40 435		Designation Uncoated	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	$\square$ mm	l_g mm	N
	P203009-EGM2.5	EGM 2.5		0,45	56	9	18	3,5	2,7	6	3
	P203009-EGM3	EGM 3		0,5	63	12	21	4,5	3,4	6	3
	P203009-EGM4	EGM 4		0,7	70	13	25	6	4,9	8	3
	P203009-EGM5	EGM 5		0,8	80	15	30	6	4,9	8	3
	P203009-EGM6	EGM 6		1	90	18	35	8	6,2	9	3
	P203009-EGM8	EGM 8		1,25	100	20	39	10	8	11	3

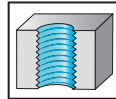
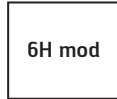
DIN 40 435		Designation Uncoated	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	$\square$ mm	l_g mm	N
	P203509-EGM10	EGM 10		1,5	100	21	73	9	7	10	3
	P203509-EGM12	EGM 12		1,75	110	25	81	11	9	12	3
	P203509-EGM16	EGM 16		2	125	30	81	14	11	14	4

B5

HSS-E machine taps – Insert Prototex® X-pert M

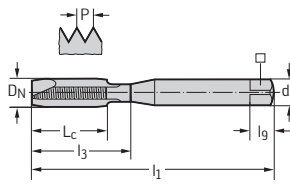


– For long-chipping materials



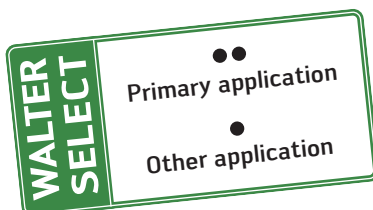
	P	M	K	N	S	H	O
VAP	●	●●	●	●	●	●	●

DIN 40 435



Designation VAP	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
M203009-EGM2.5	EGM 2.5	0,45	56	9	18	3,5	2,7	6	2
M203009-EGM3	EGM 3	0,5	63	12	21	4,5	3,4	6	2
M203009-EGM4	EGM 4	0,7	70	13	25	6	4,9	8	3
M203009-EGM5	EGM 5	0,8	80	15	30	6	4,9	8	3
M203009-EGM6	EGM 6	1	90	18	35	8	6,2	9	3
M203009-EGM8	EGM 8	1,25	100	20	39	10	8	11	3

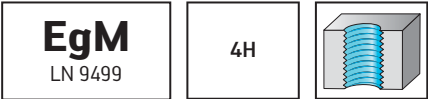
B5



HSS-E-PM machine taps – Insert
Prototex® TiNi



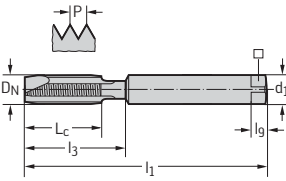
– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●●	●●	●●	●●	●●	●●	●●

~DIN 40 435										
Designation Uncoated		D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
20207-EGM4		EGM 4	0,7	70	16	16	6	4,9	8	3
20207-EGM5		EGM 5	0,8	80	15	23	6	4,9	8	3
20207-EGM6		EGM 6	1	90	18	29	8	6,2	9	3
20207-EGM8		EGM 8	1,25	100	20	33	10	8	11	3

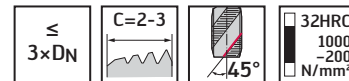
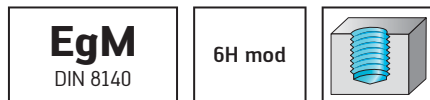
EGM 4: Without reduced neck after the thread



HSS-E machine taps – Insert Paradur® X-pert P

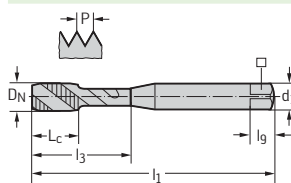


– For long-chipping materials



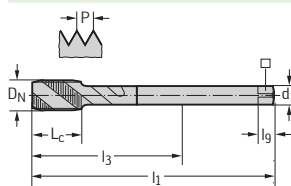
	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

DIN 40 435



Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
P205099-EGM2.5	EGM 2.5	0,45	56	6	18	3,5	2,7	6	3
P205099-EGM3	EGM 3	0,5	63	7	21	4,5	3,4	6	3
P205099-EGM4	EGM 4	0,7	70	8	25	6	4,9	8	3
P205099-EGM5	EGM 5	0,8	80	10	30	6	4,9	8	3
P205099-EGM6	EGM 6	1	90	12	35	8	6,2	9	3
P205099-EGM8	EGM 8	1,25	100	15	39	10	8	11	3

DIN 40 435



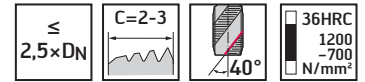
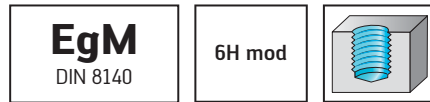
Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
P205599-EGM10	EGM 10	1,5	100	13	73	9	7	10	4
P205599-EGM12	EGM 12	1,75	110	20	81	11	9	12	4
P205599-EGM14	EGM 14	2	110	20	68	12	9	12	4
P205599-EGM16	EGM 16	2	125	25	81	14	11	14	4
P205599-EGM20	EGM 20	2,5	160	25	113	18	14,5	17	4
P205599-EGM24	EGM 24	3	160	30	97	20	16	19	4



HSS-E machine taps – Insert Paradur® X-pert M



– For long-chipping materials



	P	M	K	N	S	H	O
VAP	●	●●	●	●	●	●	●

DIN 40 435										
	Designation VAP	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	M205049-EGM2.5	EGM 2.5	0,45	56	6	18	3,5	2,7	6	3
	M205049-EGM3	EGM 3	0,5	63	7	21	4,5	3,4	6	3
	M205049-EGM4	EGM 4	0,7	70	8	25	6	4,9	8	3
	M205049-EGM5	EGM 5	0,8	80	10	30	6	4,9	8	3
	M205049-EGM6	EGM 6	1	90	12	35	8	6,2	9	3
	M205049-EGM8	EGM 8	1,25	100	15	39	10	8	11	3

DIN 40 435										
	Designation VAP	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	M205549-EGM10	EGM 10	1,5	100	13	73	9	7	10	4
	M205549-EGM12	EGM 12	1,75	110	20	81	11	9	12	4
	M205549-EGM14	EGM 14	2	110	20	68	12	9	12	4
	M205549-EGM16	EGM 16	2	125	25	81	14	11	14	4

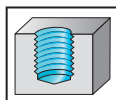
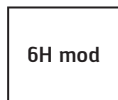
B5



HSS-E machine taps – Insert Paradur® X-pert N

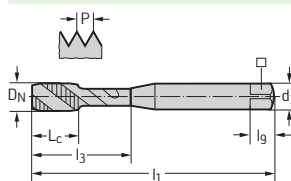


– For long-chipping materials



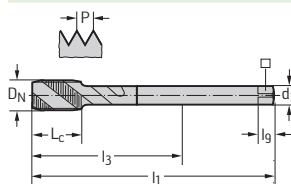
	P	M	K	N	S	H	O
Uncoated				●	●		●

DIN 40 435



Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
N205069-EGM2.5	EGM 2.5	0,45	56	6	18	3,5	2,7	6	2
N205069-EGM3	EGM 3	0,5	63	7	21	4,5	3,4	6	2
N205069-EGM4	EGM 4	0,7	70	8	25	6	4,9	8	2
N205069-EGM5	EGM 5	0,8	80	10	30	6	4,9	8	3
N205069-EGM6	EGM 6	1	90	12	35	8	6,2	9	3
N205069-EGM8	EGM 8	1,25	100	15	39	10	8	11	3

DIN 40 435



Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
N205569-EGM10	EGM 10	1,5	100	13	73	9	7	10	3
N205569-EGM12	EGM 12	1,75	110	20	81	11	9	12	3
N205569-EGM16	EGM 16	2	125	25	81	14	11	14	4



HSS-E-PM machine taps – Insert Paradur® Ni



– For long-chipping materials

EgM
LN 9499

4H

$\leq 1,5 \times DN$

$C=2-3$

25°

44HRC
1400
~700
N/mm²

	P	M	K	N	S	H	O
Uncoated	●●		●●	●	●		

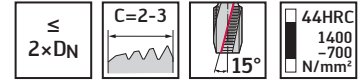
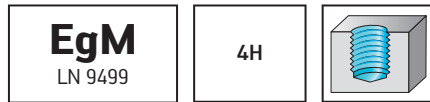
~DIN 40 435										
	Designation	D_N	P	l_1	L_c	l_3	d_1		l_g	N
	Uncoated		mm	mm	mm	mm	mm	mm	mm	
	204089-EGM4	EGM 4	0,7	70	16	16	6	4,9	8	3
	204089-EGM5	EGM 5	0,8	80	15	23	6	4,9	8	3
	204089-EGM6	EGM 6	1	90	18	29	8	6,2	9	3
	204089-EGM8	EGM 8	1,25	100	20	33,5	10	8	11	4

EGM 4: Without reduced neck after the thread

HSS-E-PM machine taps – Insert Paradur® Ti



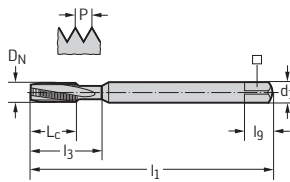
– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●●			●	●●		

~DIN 40 435										
Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N	
204069-EGM4	EGM 4	0,7	70	16	16	6	4,9	8	3	
204069-EGM5	EGM 5	0,8	80	15	23	6	4,9	8	3	
204069-EGM6	EGM 6	1	90	18	29	8	6,2	9	3	
204069-EGM8	EGM 8	1,25	100	20	33,5	10	8	11	3	

EGM 4: Without reduced neck after the thread



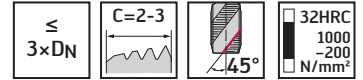
B5



HSS-E machine taps – Insert Paradur® X-pert P

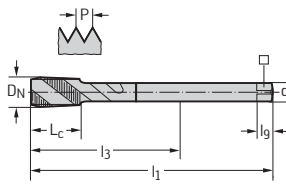


– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

DIN 40 435

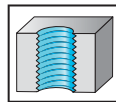
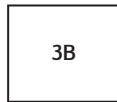


Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
P215599-EGM8X1	EGMF 8x1	1	90	12	67	7	5,5	8	3
P215599-EGM10X1	EGMF 10x1	1	100	13	73	9	7	10	3
P215599-EGM12X1.5	EGMF 12x1.5	1,5	100	15	71	11	9	12	4
P215599-EGM14X1.5	EGMF 14x1.5	1,5	100	15	58	12	9	12	4
P215599-EGM16X1.5	EGMF 16x1.5	1,5	110	17	66	14	11	14	4

HSS-E machine taps – Insert Prototex® X-pert P

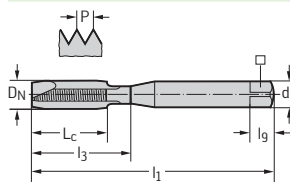


– For long-chipping materials



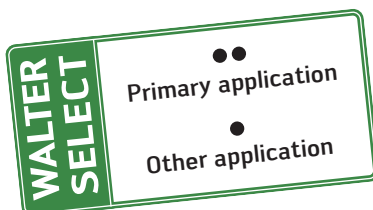
	P	M	K	N	S	H	O
Uncoated	●●			●			●

DIN 2184-1



Designation Uncoated	D _N -P	D _N mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	□ mm	l ₉ mm	N
P223009-EGUNC6	EGUNC 6-32	4,536	70	13	25	6	4,9	8	3
P223009-EGUNC8	EGUNC 8-32	5,197	80	15	30	6	4,9	8	3
P223009-EGUNC10	EGUNC 10-24	6,201	80	15	30	7	5,5	8	3
P223009-EGUNC1/4	EGUNC 1/4-20	8	90	18	35	8	6,2	9	3

B5



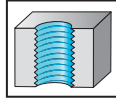
HSS-E-PM machine taps – Insert Prototex® TiNi



– For long-chipping materials

EgUNC
NASM 33537

3B



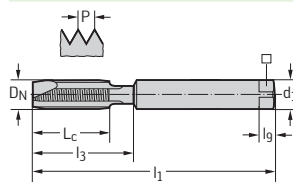
$\leq 2 \times D_N$

B=3,5-5

44HRC
1400
-700
N/mm²

	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

DIN 2184-1



Designation Uncoated	D _N -P	D _N mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	mm	l ₉ mm	N
222079-EGUNC4	EGUNC 4-40	3,67	63	13	13	4,5	3,4	6	3
222079-EGUNC6	EGUNC 6-32	4,536	70	16	16	6	4,9	8	3
222079-EGUNC8	EGUNC 8-32	5,197	80	15	23	6	4,9	8	3

≤ EGUNC 6: Without reduced neck after the thread

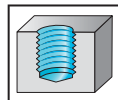
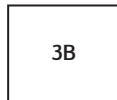
B5



HSS-E machine taps – Insert Paradur® X-pert P

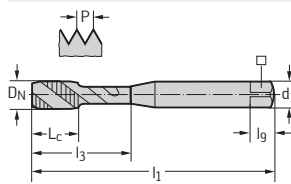


– For long-chipping materials



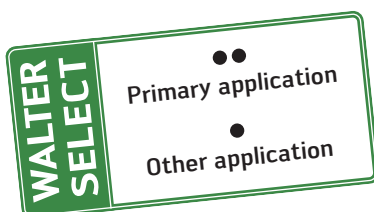
	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

DIN 2184-1



Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
P225099-EGUNC6	EGUNC 6-32	4,536	70	8	25	6	4,9	8	3
P225099-EGUNC8	EGUNC 8-32	5,197	80	10	30	6	4,9	8	3
P225099-EGUNC10	EGUNC 10-24	6,201	80	10	30	7	5,5	8	3
P225099-EGUNC1/4	EGUNC 1/4-20	8	90	12	35	8	6,2	9	3

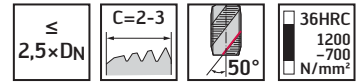
B5



HSS-E machine taps – Insert Paradur® X-pert M



– For long-chipping materials



P	M	K	N	S	H	O
●	●●					

DIN 2184-1		Designation VAP	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	M225049-EGUNC4	EGUNC 4-40		3,67	63	7	21	4,5	3,4	6	3
	M225049-EGUNC6	EGUNC 6-32		4,536	70	8	25	6	4,9	8	3
	M225049-EGUNC8	EGUNC 8-32		5,197	80	10	30	6	4,9	8	3
	M225049-EGUNC10	EGUNC 10-24		6,201	80	10	30	7	5,5	8	3
	M225049-EGUNC1/4	EGUNC 1/4-20		8	90	12	35	8	6,2	9	3

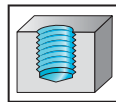
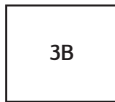
DIN 2184-1		Designation VAP	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	M225549-EGUNC5/16	EGUNC 5/16-18		9,771	100	15	77	7	5,5	8	3
	M225549-EGUNC3/8	EGUNC 3/8-16		11,587	100	13	73	9	7	10	3
	M225549-EGUNC1/2	EGUNC 1/2-13		15,238	110	20	68	12	9	12	4

B5

HSS-E machine taps – Insert Paradur® X-pert N



– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated				●	●		●

DIN 2184-1		Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	N225069-EGUNC6	EGUNC 6-32		4,536	70	8	25	6	4,9	8	2
	N225069-EGUNC8	EGUNC 8-32		5,197	80	10	30	6	4,9	8	2
	N225069-EGUNC10	EGUNC 10-24		6,201	80	10	30	7	5,5	8	2
	N225069-EGUNC1/4	EGUNC 1/4-20		8	90	12	35	8	6,2	9	2

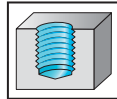
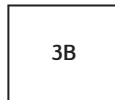
B5



HSS-E-PM machine taps – Insert Paradur® Ti

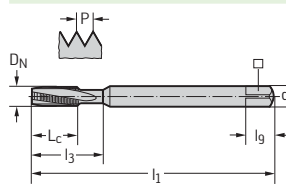


– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●●			●	●●		

~DIN 2184-1



Designation Uncoated	DN-P	DN mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
224069-EGUNC4	EGUNC 4-40	3,67	63	13	13	4,5	3,4	6	3
224069-EGUNC6	EGUNC 6-32	4,536	70	16	16	6	4,9	8	3
224069-EGUNC8	EGUNC 8-32	5,197	80	15	23	6	4,9	8	3

≤ EGUNC 6: Without reduced neck after the thread

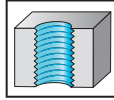
HSS-E machine taps – Insert Prototex® X-pert P



– For long-chipping materials

EgUNF
NASM 33537

3B



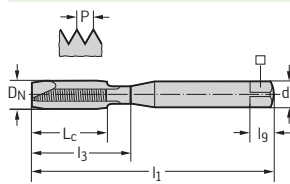
$\leq 3 \times D_N$

B=3,5-5

32HRC
1000
–200
N/mm²

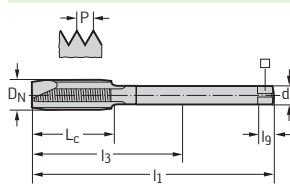
	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

DIN 2184-1



Designation Uncoated	D _N -P	D _N mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	mm	l _g mm	N
P233009-EGUNF6	EGUNF 6-40	4,33	70	13	25	6	4,9	8	3
P233009-EGUNF8	EGUNF 8-36	5,083	80	15	30	6	4,9	8	3
P233009-EGUNF10	EGUNF 10-32	5,857	80	15	30	6	4,9	8	3
P233009-EGUNF1/4	EGUNF 1/4-28	7,528	90	18	35	8	6,2	9	3

DIN 2184-1



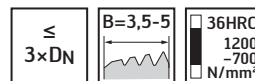
Designation Uncoated	D _N -P	D _N mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	mm	l _g mm	N
P233509-EGUNF5/16	EGUNF 5/16-24	9,313	90	20	67	7	5,5	8	3
P233509-EGUNF3/8	EGUNF 3/8-24	10,9	90	20	66	8	6,2	9	3
P233509-EGUNF7/16	EGUNF 7/16-20	12,763	100	21	73	9	7	10	4
P233509-EGUNF1/2	EGUNF 1/2-20	14,35	100	21	71	11	9	12	4



HSS-E machine taps – Insert Prototex® X-pert M

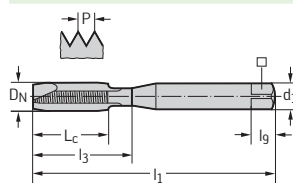


– For long-chipping materials



	P	M	K	N	S	H	O
VAP	●	●●					

DIN 2184-1



Designation VAP	D _N -P	D _N mm	l ₁ h9 mm	L _c mm	l ₃ mm	d ₁ mm	□ mm	l _g mm	N
M233009-EGUNF8	EGUNF 8-36	5,083	80	15	30	6	4,9	8	3
M233009-EGUNF10	EGUNF 10-32	5,857	80	15	30	6	4,9	8	3
M233009-EGUNF1/4	EGUNF 1/4-28	7,528	90	18	35	8	6,2	9	3

B5



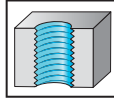
HSS-E-PM machine taps – Insert Prototex® TiNi



– For long-chipping materials

EgUNF
NASM 33537

3B



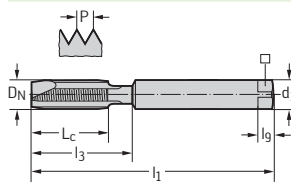
$\leq$
 $2 \times D_N$

$B=3,5-5$

44HRC
1400
~700
N/mm²

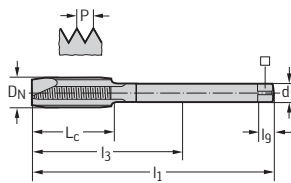
	P	M	K	N	S	H	O
Uncoated	●●	●●	●●	●●	●●	●●	●●

~DIN 2184-1



Designation Uncoated	D_N -P	D_N mm	l_1 h9 mm	L_c mm	l_3 mm	d_1 mm	$\square$ mm	l_g mm	N
232079-EGUNF10	EGUNF 10-32	5,857	80	15	23	6	4,9	8	3
232079-EGUNF1/4	EGUNF 1/4-28	7,528	90	18	29,5	8	6,2	9	3
232079-EGUNF5/16	EGUNF 5/16-24	9,313	100	20	33,5	10	8	11	3

DIN 2184-1



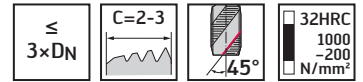
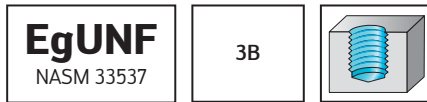
Designation Uncoated	D_N -P	D_N mm	l_1 h9 mm	L_c mm	l_3 mm	d_1 mm	$\square$ mm	l_g mm	N
232579-EGUNF3/8	EGUNF 3/8-24	10,9	100	20	76	8	6,2	9	3



HSS-E machine taps – Insert Paradur® X-pert P

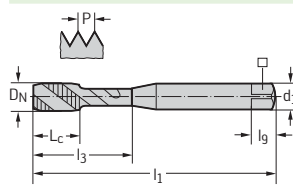


– For long-chipping materials



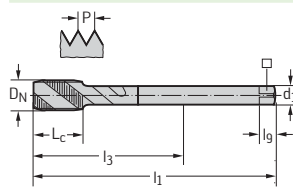
	P	M	K	N	S	H	O
Uncoated	●	●	●	●	●	●	●

DIN 2184-1



Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
P235099-EGUNF6	EGUNF 6-40	4,33	70	8	25	6	4,9	8	3
P235099-EGUNF8	EGUNF 8-36	5,083	80	10	30	6	4,9	8	3
P235099-EGUNF10	EGUNF 10-32	5,857	80	10	30	6	4,9	8	3
P235099-EGUNF1/4	EGUNF 1/4-28	7,528	90	12	35	8	6,2	9	3

DIN 2184-1



Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
P235599-EGUNF5/16	EGUNF 5/16-24	9,313	90	12	67	7	5,5	8	3
P235599-EGUNF3/8	EGUNF 3/8-24	10,9	90	15	66	8	6,2	9	3
P235599-EGUNF7/16	EGUNF 7/16-20	12,763	100	13	73	9	7	10	4
P235599-EGUNF1/2	EGUNF 1/2-20	14,35	100	15	71	11	9	12	4

B5



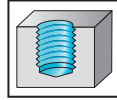
HSS-E machine taps – Insert Paradur® X-pert M



– For long-chipping materials

EgUNF
NASM 33537

3B



$\leq$
 $2,5 \times D_N$

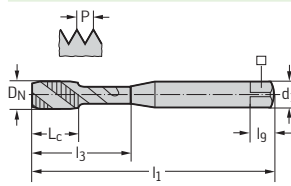
$C=2-3$

$\angle 40^\circ$

36HRC
1200
– 700
N/mm²

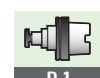
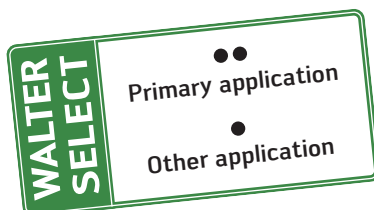
	P	M	K	N	S	H	O
VAP	●	●●					

DIN 2184-1



Designation VAP	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
M235049-EGUNF10	EGUNF 10-32	5,857	80	10	30	6	4,9	8	3
M235049-EGUNF1/4	EGUNF 1/4-28	7,528	90	12	35	8	6,2	9	3

B5



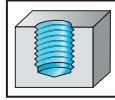
HSS-E machine taps – Insert Paradur® X-pert N



– For long-chipping materials

EgUNF
NASM 33537

3B



$\leq 3 \times D_N$

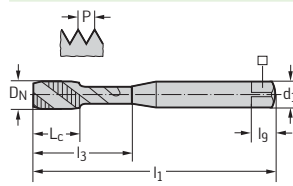
C=2-3

35°

14HRC
700
–200
N/mm²

	P	M	K	N	S	H	O
Uncoated				●	●		●

DIN 2184-1



Designation Uncoated	D_N -P	D_N mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	$\square$ mm	l_g mm	N
N235069-EGUNF10	EGUNF 10-32	5,857	80	10	30	6	4,9	8	2
N235069-EGUNF1/4	EGUNF 1/4-28	7,528	90	12	35	8	6,2	9	3

B5



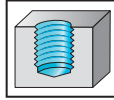
HSS-E-PM machine taps – Insert Paradur® Ni



– For long-chipping materials

EgUNF
NASM 33537

3B



≤
1,5×DN

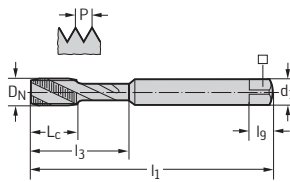
C=2-3

25°

44HRC
1400
~700
N/mm²

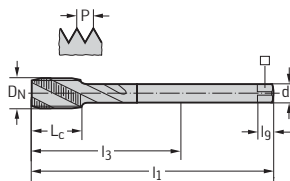
	P	M	K	N	S	H	O
Uncoated	●●	●	●●	●	●	●	●

~DIN 2184-1

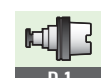
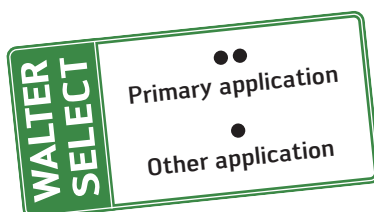


Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
234079-EGUNF10	EGUNF 10-32	5,857	80	15	23	6	4,9	8	3
234079-EGUNF1/4	EGUNF 1/4-28	7,528	90	18	29,5	8	6,2	9	3
234079-EGUNF5/16	EGUNF 5/16-24	9,313	100	20	33,5	10	8	11	4

DIN 2184-1



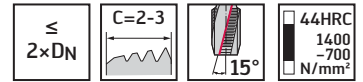
Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
234579-EGUNF3/8	EGUNF 3/8-24	10,9	100	20	76	8	6,2	9	4



HSS-E-PM machine taps – Insert Paradur® Ti



– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●●	●	●	●	●●	●	●

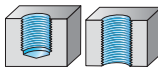
~DIN 2184-1		Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	234069-EGUNF10	EGUNF 10-32		5,857	80	15	23	6	4,9	8	3
	234069-EGUNF1/4	EGUNF 1/4-28		7,528	90	18	29,5	8	6,2	9	3
	234069-EGUNF5/16	EGUNF 5/16-24		9,313	100	20	33,5	10	8	11	3

DIN 2184-1		Designation Uncoated	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	234569-EGUNF3/8	EGUNF 3/8-24		10,9	100	20	76	8	6,2	9	4

B5

Solid carbide taps product range overview

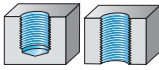
M – Metric thread

Machining						
Thread depth	1,5 × D _N	2 × D _N		3 × D _N	1,5 × D _N	2 × D _N
Designation	Prototex® HSC	Paradur® Hard	Paradur® Hard Plus	Paradur® HS	Paradur® N	Paradur® HSC
Dimension range	M 6–M 12	M 3–M 16	M 3–M 16	M 3–M 12	M 3–M 10	M 6–M 12
Tolerance	6HX	6HX	6HX	6H	6H	6HX
Coolant supply	Cooling grooves on the shank	External	External	External	External	Axial
Chamfer/Lead form	B	C	D	C	C	C
Coating/grade	TiCN	TiCN	TiCN	TiCN/uncoated	TiCN/uncoated	TiCN
Version length	M	M	M	M	M	M
Page	B 989	B 997	B 998	B 995	B 991	B 990
						

Machining				
Thread depth	$3 \times D_N$		$3,5 \times D_N$	
Designation	Paradur® Engine	Paradur® HS	Paradur® N	Paradur® GG
Dimension range	M 6–M 12	M 5–M 10	M 5–M 12	M 5–M 10
Tolerance	6HX	6H	6H	6HX
Coolant supply	Axial	Axial	Axial	Axial
Chamfer/Lead form	E	C	C	C
Coating/grade	Uncoated	TiCN	Uncoated	TAFT/uncoated
Version length	L	M	M	M
Page	B 994	B 996	B 992	B 993
				

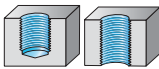
Solid carbide taps product range overview

MF – Metric fine-pitch thread

Machining					
Thread depth	$1,5 \times D_N$	$3 \times D_N$	$2 \times D_N$	$3 \times D_N$	$3,5 \times D_N$
Designation	Prototex® HSC	Paradur® HS	Paradur® HSC	Paradur® Engine	Paradur® GG
Dimension range	MF 6x0.75– MF 16x1.5	MF 8x1– MF 16x1.5	MF 6x0.75– MF 16x1.5	MF 10x1– MF 16x1.5	MF 8x1– MF 12x1.5
Tolerance	6HX	6H	6HX	6HX	6HX
Coolant supply	Cooling grooves on the shank	External	Axial	Axial	Axial
Chamfer/Lead form	B	C	C	E	C
Coating/grade	TICN	Uncoated	TICN	Uncoated	TAFT
Version length	M	M	M	L	M
Page	B 999	B 1003	B 1000	B 1002	B 1001
					

Solid carbide taps product range overview

UNC, UNF, G

Machining			
Thread depth	$3 \times D_N$		$2 \times D_N$
Designation	Paradur® HS	Paradur® HS	Paradur® Hard Scraper
Dimension range	UNC 10-24– UNC 1/2-13	UNF 10-32– UNF 3/8-24	G 1/8-28– G 1/4-19
Tolerance	2B	2B	NORMAL
Coolant supply	External	External	External
Chamfer/Lead form	C	C	C
Coating/grade	TICN	TICN	TICN
Version length	M	M	M
Page	B 1004	B 1005	B 1006
			



Solid carbide taps designation key

Example:

8	0	4	1	5	0	6
1	2	3	4	5	6	7

1
Tool type
8 Solid carbide taps

2
Thread type
0 Metric 1 Metric fine 2 UNC 3 UNF 4 G

3
Design
2 Prototex®, spiral point 3 Paradur®, straight flutes 4 Paradur®, low-helix

4
Tolerance class/shank
1 ISO 2/6H, 6HX Reinforced shank 6 ISO 2/6H, 6HX Reduced shank

5
Tool type
0 HSC/N 1 HS 2 Hard Scraper 3 Engine 4 GG 8 Hard 9 Hard Plus

6
Modification
0 None 1 Internal coolant supply, axial outlet 3 Extended shank 4 Internal coolant supply, radial outlet 5 Combination of various points

7
Surface treatment
0 None 6 TiCN 7 TAFT

B5

Walter Select – Solid carbide taps

Step by step to the right tool

STEP 1

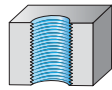
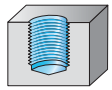
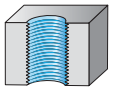
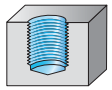
Determine the **material** to be machined from page B 1174 onwards:

Note the **machining group** that corresponds to your material, e.g.: P10.

Code letters	Machining groups	Groups of the materials to be machined	
P	P1–P15	Steel	All types of steel and steel casting, with the exception of steel with an austenitic structure
M	M1–M3	Stainless steel	Austenitic stainless steel, austenitic-ferritic steel and steel casting
K	K1–K7	Cast iron	Grey cast iron, cast iron with spheroidal graphite, malleable cast iron, cast iron with vermicular graphite
N	N1–N10	NF metals	Aluminium and other non-ferrous metals, non-ferrous materials
S	S1–S10	Materials with difficult cutting properties	Heat-resistant special alloys based on iron, nickel and cobalt, titanium and titanium alloys
H	H1–H4	Hard materials	Hardened steel, hardened cast iron materials, chilled cast iron
O	O1–O6	Other	Plastics, glass and carbon fibre reinforced plastics, graphite

STEP 2

Select your intended **application** from the table.

Tapping Solid carbide							
							
Thread depth	$1,5 \times D_N$	$2,0 \times D_N$	$3,0 \times D_N$	$1,5 \times D_N$	$2,0 \times D_N$	$3,0 \times D_N$	$3,5 \times D_N$
Page	B 986	B 986	B 987	B 987	B 987	B 987	B 988

STEP 3

Select the **tool** according to the following criteria:

- Material group
- Thread type
- Thread depth

Walter Select solid carbide taps												
Material group	 Primary application Other application			Machining								
				Thread depth		1.5 × D _N	2 × D _N					
				Designation		Prototex® HSC	Paradur® Hard					
				Coolant supply		Coolant grooves on the flank	External					
				Coating / grade		TiCN	TiCN					
				Thread type / Page		M MF B 989 B 999	M B 997					
				Drill bar (mm) Tap length (mm) Machining group								
P	Non-alloyed steel	C ≤ 0.25%	Annealed	125	430	P1						
		C > 0.25% ≤ 0.55%	Annealed	190	640	P2	●					
		C > 0.25% ≤ 0.55%	Heat-treated	210	710	P3	●●					
		C ≤ 0.55%	Annealed	190	640	P4	●●●					
		C > 0.55%	Heat-treated	300	1010	P5	●●●					
	Low-alloyed steel	Free cutting steel (short-chipping)	Annealed	220	750	P6	●●●					
			Annealed	175	590	P7	●●●					
			Heat-treated	285	960	P8	●●●					
			Heat-treated	380	1280	P9	●●●					
			Heat-treated	430	1480	P10	●					
H	High-alloyed steel and high-alloy tool steel		Annealed	200	680	P11	●●●					
			Hardened and tempered	300	1010	P12	●●●					
			Hardened and tempered	380	1280	P13	●●●					
			Ferritic/martensitic, annealed	200	680	P14	●●					
			Martensitic, heat-treated	330	1110	P15						
M	Stainless steel	Austenitic, quench hardened	200	680	M1							
		Austenitic, precipitation hardened (PH)	300	1010	M2							
		Austenitic/Ferritic, duplex	230	760	M3							
K	Malleable cast iron	Ferritic	200	680	K1		●●					
		Pearlitic	260	700	K2		●●●					
	Grey cast iron	Low tensile strength	180	200	K3		●					
		High tensile strength/austenitic	245	350	K4		●					
	Cast iron with spheroidal graphite (GGV (GG))	Ferritic	155	400	K5		●●●					
		Pearlitic	285	700	K6		●●●					

STEP 4

The corresponding page in the catalogue is specified following tool selection.

At the bottom right of the catalogue page, you will find a reference to the **cutting data table**.

Solid carbide machine taps

Paradur® N

– For long-chipping and short-chipping materials

Uncoded

DIN 371

Designation

Uncoded

	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h6 mm	$\square$ mm	l_9 mm	N
	M 5	0.8	70	16	16	6	4.9	8	3
804101-M5	M 5	0.8	70	16	16	6	4.9	8	3
804101-M6	M 6	1	80	19	30	6	4.9	8	3
804101-M8	M 8	1.25	90	22	35	8	6.2	9	3
804101-M10	M 10	1.5	100	24	39	10	8	11	3

M 5: Without reduced neck after the thread

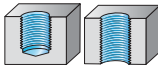
DIN 375

STEP 5

Select the **cutting data** for the tool type from page B 1008 onwards.

Material group	= Cooling lubricant recommended E = Emulsion O = Oil C = Cutting speed	Overview of the main material groups and code letters						
			Brinell hardness HB	Tensile strength R _m N/mm²	Machining group ¹	HSS-E (PM) taps		
						Uncoated		
						v _c [m/min] 1.5 × D _N	2 × D _N	2.5 × D _N
P Non-alloyed steel	C ≤ 0.25%	Annealed	125 430	P1	16	13	12	E
	C > 0.25% to ≤ 0.55%	Annealed	190 640	P2	20	17	14	E
	C > 0.25% to ≤ 0.55%	Heat-treated	210 710	P3	10	9	7	E
	C < 0.55%	Annealed	190 640	P4	10	9	7	E
	C < 0.55%	Heat-treated	300 1010	P5	6	5	4	E
	Free cutting steel (short-chipping)	Annealed	220 750	P6	10	9	7	E
	Annealed	175 590	P7	20	17	14	E	
	Heat-treated	285 960	P8	5	4	4	E	
	Heat-treated	380 1280	P9	3	3	2	E	
Low-alloyed steel	Heat-treated	430 1480	P10	3	2	2	O	
	Annealed	200 680	P11	10	9	7	E	
	Hardened and tempered	300 1010	P12	6	5	4	E	
High-alloyed steel and high-alloyed tool steel	Hardened and tempered	380 1280	P13	3	3	2	O	
	Ferritic/martensitic, annealed	200 680	P14	3	2	2	E	
Stainless steel	Martensitic, heat-treated	330 1110	P15	3	2	2	E	

Walter Select solid carbide taps

Material group	WALTER SELECT ●● Primary application ● Other application Overview of the main material groups and code letters			Machining						
				Thread depth			1,5 × D _N	2 × D _N		
				Designation			Prototex® HSC	Paradur® Hard		
				Coolant supply			Coolant grooves on the shank	External		
				Coating / grade			TICN	TICN		
				Thread type Page			M MF	B 989 B 999	M B 997	
				Brinell hardness HB	Tensile strength R _m N/mm²	Machining group				
P	Non-alloyed steel	C ≤ 0.25%	Annealed	125	430	P1				
		C > 0.25... ≤ 0.55%	Annealed	190	640	P2	●			
		C > 0.25... ≤ 0.55%	Heat-treated	210	710	P3	●●			
		C > 0.55%	Annealed	190	640	P4	●●			
		C > 0.55%	Heat-treated	300	1010	P5	●●			
		Free cutting steel (short-chipping)	Annealed	220	750	P6	●●			
	Low-alloyed steel	Annealed		175	590	P7	●●			
		Heat-treated		285	960	P8	●●			
		Heat-treated		380	1280	P9	●●			
		Heat-treated		430	1480	P10	●			
	High-alloyed steel and high-alloyed tool steel	Annealed		200	680	P11	●●			
		Hardened and tempered		300	1010	P12	●●			
		Hardened and tempered		380	1280	P13	●●			
	Stainless steel	Ferritic/martensitic, annealed		200	680	P14				
		Martensitic, heat-treated		330	1110	P15				
M	Stainless steel	Austenitic, quench hardened		200	680	M1				
		Austenitic, precipitation hardened (PH)		300	1010	M2				
		Austenitic/ferritic, duplex		230	780	M3				
K	Malleable cast iron	Ferritic		200	400	K1	●●			
		Pearlitic		260	700	K2	●●			
	Grey cast iron	Low tensile strength		180	200	K3	●			
		High tensile strength/austenitic		245	350	K4	●			
	Cast iron with spheroidal graphite	Ferritic		155	400	K5	●●			
		Pearlitic		265	700	K6	●●			
	GGV (CGI)			230	400	K7	●			
N	Wrought aluminium alloys	Not hardenable		30	-	N1				
		Hardenable, hardened		100	340	N2				
	Cast aluminium alloys	≤ 12% Si, not hardenable		75	260	N3				
		≤ 12% Si, hardenable, hardened		90	310	N4				
		> 12% Si, not hardenable		130	450	N5				
	Magnesium-based alloys		70	250	N6					
	Copper and copper alloys (bronze/brass)	Non-alloyed, electrolytic copper		100	340	N7				
		Brass, bronze, red brass		90	310	N8				
		Cu-alloys, short-chipping		110	380	N9				
		High-tensile, Ampco		300	1010	N10				
S	Heat-resistant alloys	Fe-based	Annealed	200	680	S1				
			Hardened	280	940	S2				
		Ni or Co base	Annealed	250	840	S3				
			Hardened	350	1180	S4				
			Cast	320	1080	S5				
	Titanium alloys	Pure titanium		200	680	S6				
		α and β alloys, hardened		375	1260	S7				
		β alloys		410	1400	S8				
	Tungsten alloys			300	1010	S9		●		
Molybdenum alloys			300	1010	S10		●			
H	Hardened steel			<63 HRC	-	H1-H4		●●		
O	Plastics, graphite					01-06				

B5

Walter Select solid carbide taps

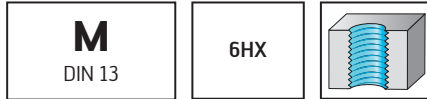
Material group	WALTER SELECT ●● Primary application ● Other application			Machining				
				Thread depth			3,5 × D _N	
				Designation			Paradur® N	Paradur® GG
				Coolant supply			Axial	Axial
				Coating / grade			Uncoated	TAFT / uncoated
				Thread type Page			M B 992	M MF B 993 B 1001
								
Overview of the main material groups and code letters								
P	Non-alloyed steel	C ≤ 0.25%	Annealed	125	430	P1		
		C > 0.25... ≤ 0.55%	Annealed	190	640	P2		
		C > 0.25... ≤ 0.55%	Heat-treated	210	710	P3		
		C > 0.55%	Annealed	190	640	P4		
		C > 0.55%	Heat-treated	300	1010	P5		
		Free cutting steel (short-chipping)	Annealed	220	750	P6		
	Low-alloyed steel	Annealed		175	590	P7		
		Heat-treated		285	960	P8		
		Heat-treated		380	1280	P9		
		Heat-treated		430	1480	P10		
	High-alloyed steel and high-alloyed tool steel	Annealed		200	680	P11		
		Hardened and tempered		300	1010	P12		
		Hardened and tempered		380	1280	P13		
	Stainless steel	Ferritic/martensitic, annealed		200	680	P14		
		Martensitic, heat-treated		330	1110	P15		
M	Stainless steel	Austenitic, quench hardened		200	680	M1		
		Austenitic, precipitation hardened (PH)		300	1010	M2		
		Austenitic/ferritic, duplex		230	780	M3		
K	Malleable cast iron	Ferritic		200	400	K1	●	●
		Pearlitic		260	700	K2	●	●
	Grey cast iron	Low tensile strength		180	200	K3	●	●●
		High tensile strength/austenitic		245	350	K4	●	●●
	Cast iron with spheroidal graphite	Ferritic		155	400	K5	●	●
		Pearlitic		265	700	K6	●	●
	GGV (CGI)			230	400	K7	●	●●
N	Wrought aluminium alloys	Not hardenable		30	-	N1		
		Hardenable, hardened		100	340	N2		
	Cast aluminium alloys	≤ 12% Si, not hardenable		75	260	N3	●	●
		≤ 12% Si, hardenable, hardened		90	310	N4	●	●
		> 12% Si, not hardenable		130	450	N5	●	●
	Magnesium-based alloys			70	250	N6	●	●
		Non-alloyed, electrolytic copper		100	340	N7		
		Brass, bronze, red brass		90	310	N8		
		Cu-alloys, short-chipping		110	380	N9		
		High-tensile, Ampco	300	1010	N10		●	
S	Heat-resistant alloys	Fe-based	Annealed	200	680	S1		
			Hardened	280	940	S2		
		Ni or Co base	Annealed	250	840	S3		
			Hardened	350	1180	S4		
			Cast	320	1080	S5		
	Titanium alloys	Pure titanium		200	680	S6		
		α and β alloys, hardened		375	1260	S7		
		β alloys		410	1400	S8		
	Tungsten alloys			300	1010	S9		
Molybdenum alloys			300	1010	S10			
H	Hardened steel			<63 HRC	-	H1-H4		
O	Plastics, graphite					O1-O6	●	●●

Solid carbide machine taps

Prototex® HSC

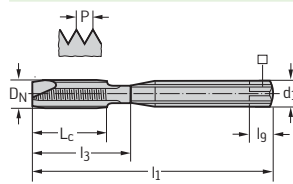


- For long-chipping materials
- Coolant grooves on the shank



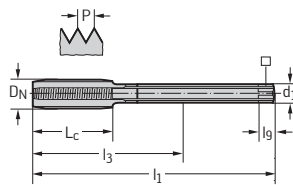
	P	M	K	N	S	H	O
TICN	●●		●●				

DIN 371



Designation TICN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	mm	l _g mm	N
8021006-M6	M 6	1	80	19	30	6	4,9	8	3
8021006-M8	M 8	1,25	90	22	35	8	6,2	9	4
8021006-M10	M 10	1,5	100	24	39	10	8	11	4

DIN 376



Designation TICN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	mm	l _g mm	N
8026006-M12	M 12	1,75	110	23	83	9	7	10	5

B5

Solid carbide machine taps

Paradur® HSC

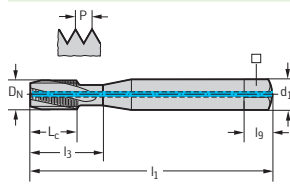


– For long-chipping and short-chipping materials



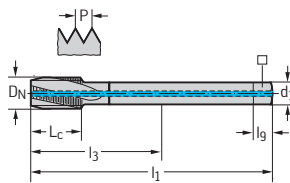
	P	M	K	N	S	H	O
TICN	●●	●●	●●	●●	●●	●●	●●

DIN 371



Designation TICN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	mm	l ₉ mm	N
8041056-M6	M 6	1	80	15	30	6	4,9	8	3
8041056-M8	M 8	1,25	90	20	35	8	6,2	9	3
8041056-M10	M 10	1,5	100	25	39	10	8	11	3

DIN 376



Designation TICN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	mm	l ₉ mm	N
8046056-M12	M 12	1,75	110	23	83	9	7	10	4

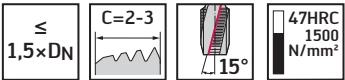


Solid carbide machine taps

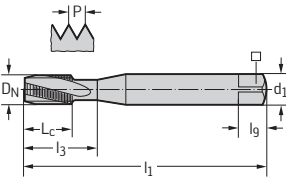
Paradur® N



– For long-chipping and short-chipping materials



	P	M	K	N	S	H	O
TICN			●●	●●			●
Uncoated			●●	●●			●

~DIN 371											
	Designation TICN	Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	mm	l ₉ mm	N
	8041006-M3	80410-M3	M 3	0,5	56	10	10	3,5	2,7	6	3
	8041006-M4	80410-M4	M 4	0,7	63	13	13	4,5	3,4	6	3
	8041006-M5	80410-M5	M 5	0,8	70	16	16	6	4,9	8	3
	8041006-M6	80410-M6	M 6	1	80	19	30	6	4,9	8	3
	8041006-M8	80410-M8	M 8	1,25	90	22	35	8	6,2	9	3
	8041006-M10	80410-M10	M 10	1,5	100	24	39	10	8	11	3

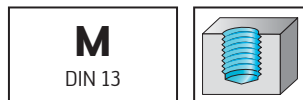
≤ M 5: Without reduced neck after the thread

Solid carbide machine taps

Paradur® N

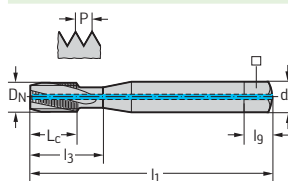


– For long-chipping and short-chipping materials



	P	M	K	N	S	H	O
Uncoated			●●	●●			●

DIN 371

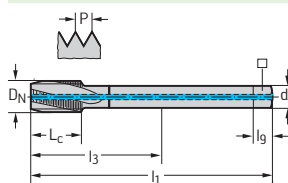


Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	□ mm	l ₉ mm	N
804101-M5	M 5	0,8	70	16	16	6	4,9	8	3
804101-M6	M 6	1	80	19	30	6	4,9	8	3
804101-M8	M 8	1,25	90	22	35	8	6,2	9	3
804101-M10	M 10	1,5	100	24	39	10	8	11	3

M 5: Without reduced neck after the thread

B5

DIN 376



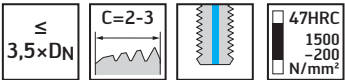
Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	□ mm	l ₉ mm	N
804601-M12	M 12	1,75	110	23	83	9	7	10	3



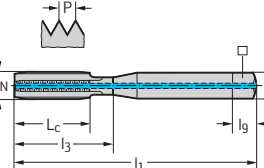
Solid carbide machine taps
Paradur® GG



– For short-chipping materials



	P	M	K	N	S	H	O
TAPT			●	●			●
Uncoated			●	●			●

DIN 371											
	Designation TAFT	Designation Uncoated	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h6 mm	$\square$ mm	l_g mm	N
	8031417-M5	803141-M5	M 5	0,8	70	16	16	6	4,9	8	4
	8031417-M6	803141-M6	M 6	1	80	19	30	6	4,9	8	4
	8031417-M8	803141-M8	M 8	1,25	90	22	35	8	6,2	9	4
	8031417-M10	803141-M10	M 10	1,5	100	24	39	10	8	11	4

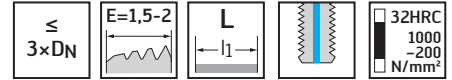
M 5: Without reduced neck after the thread

Solid carbide machine taps

Paradur® Engine



– Suitable coating according to requirements



	P	M	K	N	S	H	O
Uncoated			●●	●●			

~DIN 371 L										
Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	□ mm	l ₉ mm	N	
8031310-M6	M 6	1	80	15	30	6	4,9	8	3	
8031310-M7	M 7	1	100	15	30	7	5,5	8	3	
8031310-M8	M 8	1,25	120	18	35	8	6,2	9	3	
8031310-M10	M 10	1,5	140	20	39	10	8	11	3	

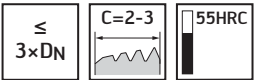
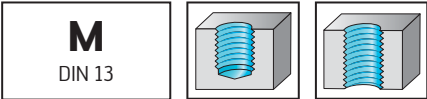
~DIN 376 L										
Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	□ mm	l ₉ mm	N	
8036310-M12	M 12	1,75	140	23	113	9	7	10	4	



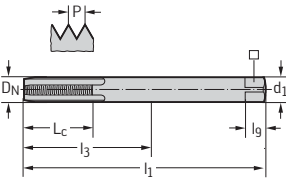
Solid carbide machine taps Paradur® HS



– For short-chipping materials



	P	M	K	N	S	H	O
TICN			●	●●	●	●	●●
Uncoated			●	●●	●	●	●●

~DIN 371												
	Designation TICN	Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	mm	l ₉ mm	N	
	8031106-M3	80311-M3	M 3	0,5	56	10	35	3,5	2,7	6	3	
	8031106-M4	80311-M4	M 4	0,7	63	13	42	4,5	3,4	6	3	
	8031106-M5	80311-M5	M 5	0,8	70	16	47	6	4,9	8	3	
	8031106-M6	80311-M6	M 6	1	80	20	57	6	4,9	8	3	
	8031106-M8	80311-M8	M 8	1,25	90	25	66	8	6,2	9	3	
	8031106-M10	80311-M10	M 10	1,5	100	30	72	10	8	11	3	
	8031106-M12	80311-M12	M 12	1,75	110	36	68	12	9	12	3	

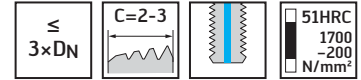
Without reduced neck after the thread

Solid carbide machine taps

Paradur® HS



– For short-chipping materials

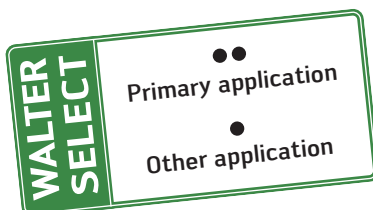


	P	M	K	N	S	H	O
TICN			●	●●	●	●	●●

~DIN 371										
	Designation TICN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	□ mm	l ₉ mm	N
	8031116-M5	M 5	0,8	70	16	16	6	4,9	8	3
	8031116-M6	M 6	1	80	19	30	6	4,9	8	3
	8031116-M7	M 7	1	80	19	30	7	5,5	8	3
	8031116-M8	M 8	1,25	90	22	35	8	6,2	9	3
	8031116-M10	M 10	1,5	100	24	39	10	8	11	3

M 5: Without reduced neck after the thread

B5

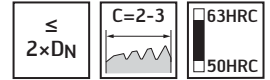


Solid carbide machine taps

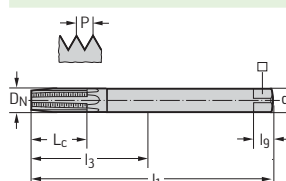
Paradur® Hard



- For short-chipping materials
- Drill core hole 0.1-0.2 mm larger



	P	M	K	N	S	H	O
TICN					●	●●	

~DIN 371										
	Designation TICN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	□ mm	l _g mm	N
	8031806-M3	M 3	0,5	56	8	35	3,5	2,7	6	4
	8031806-M4	M 4	0,7	63	11	42	4,5	3,4	6	5
	8031806-M5	M 5	0,8	70	13,5	47	6	4,9	8	5
	8031806-M6	M 6	1	80	16,5	57	6	4,9	8	5
	8031806-M8	M 8	1,25	90	21,5	66	8	6,2	9	5
	8031806-M10	M 10	1,5	100	27	72	10	8	11	5
	8031806-M12	M 12	1,75	110	32	68	12	9	12	6
	8031806-M16	M 16	2	110	41	65	16	12	15	6

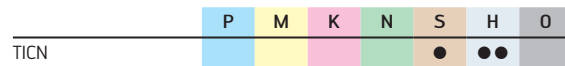
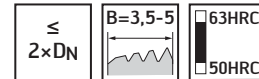
Without reduced neck after the thread

Solid carbide machine taps

Paradur® Hard Plus



- For short-chipping materials
- Drill core hole 0.1-0.2 mm larger



~DIN 371										
	Designation TICN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	mm	l ₉ mm	N
	8031906-M3	M 3	0,5	56	9	35	3,5	2,7	6	4
	8031906-M4	M 4	0,7	63	12	42	4,5	3,4	6	5
	8031906-M5	M 5	0,8	70	14,5	47	6	4,9	8	5
	8031906-M6	M 6	1	80	18	57	6	4,9	8	5
	8031906-M8	M 8	1,25	90	23,5	66	8	6,2	9	5
	8031906-M10	M 10	1,5	100	29	72	10	8	11	5
	8031906-M12	M 12	1,75	110	34,5	68	12	9	12	6
	8031906-M16	M 16	2	110	44	65	16	12	15	6

Without reduced neck after the thread

B5

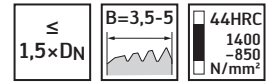
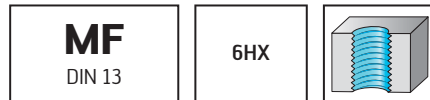


Solid carbide machine taps

Prototex® HSC



- For long-chipping materials
- Coolant grooves on the shank



	P	M	K	N	S	H	O
TICN	●●		●●				

DIN 371											
	Designation TICN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	□ mm	l _g mm	N	
	8121006-M6X0.75	MF 6x0.75	0,75	80	19	30	6	4,9	8	3	
	8121006-M8X1	MF 8x1	1	90	22	35	8	6,2	9	4	
	8121006-M10X1	MF 10x1	1	90	24	39	10	8	11	4	

DIN 374											
	Designation TICN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	□ mm	l _g mm	N	
	8126006-M12X1	MF 12x1	1	100	21	73	9	7	10	5	
	8126006-M12X1.5	MF 12x1.5	1,5	100	21	73	9	7	10	5	
	8126006-M14X1.5	MF 14x1.5	1,5	100	21	71	11	9	12	5	
	8126006-M16X1.5	MF 16x1.5	1,5	100	21	58	12	9	12	5	

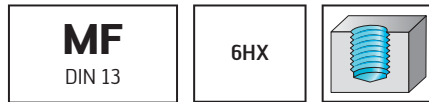
B5

Solid carbide machine taps

Paradur® HSC



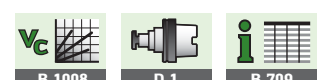
– For long-chipping materials



	P	M	K	N	S	H	O
TICN	●●	●●	●●	●●	●●	●●	●●

~DIN 371											
Designation	TICN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	mm	l ₉ mm	N	
8141056-M6X0.75		MF 6x0.75	0,75	80	15	30	6	4,9	8	3	
8141056-M8X1		MF 8x1	1	90	20	35	8	6,2	9	3	
8141056-M10X1		MF 10x1	1	90	25	39	10	8	11	3	

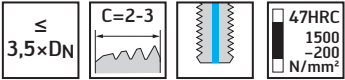
DIN 374											
Designation	TICN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	mm	l ₉ mm	N	
8146056-M12X1		MF 12x1	1	100	20	73	9	7	10	3	
8146056-M12X1.5		MF 12x1.5	1,5	100	20	73	9	7	10	4	
8146056-M14X1.5		MF 14x1.5	1,5	100	21	71	11	9	12	4	
8146056-M16X1.5		MF 16x1.5	1,5	100	21	58	12	9	12	4	



Solid carbide machine taps
Paradur® GG

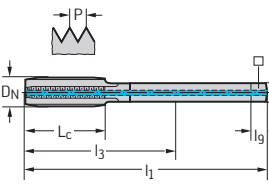


– For short-chipping materials



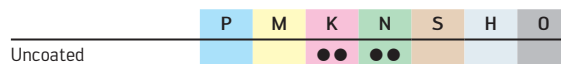
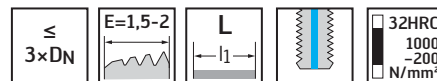
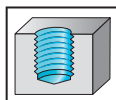
	P	M	K	N	S	H	O
TAPT			●●	●			●

DIN 374



Designation TAPT	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	mm	l ₉ mm	N
8136417-M8X1	MF 8x1	1	90	12	67	6	4,9	8	4
8136417-M10X1	MF 10x1	1	90	14	67	7	5,5	8	4
8136417-M12X1.5	MF 12x1.5	1,5	100	20	73	9	7	10	4

- Suitable coating according to requirements
- For short-chipping materials

[illegible]

B5

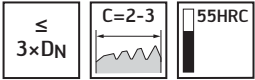
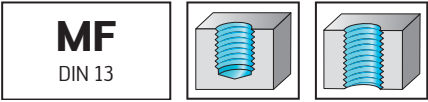


Solid carbide machine taps

Paradur® HS

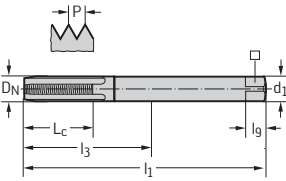


– For short-chipping materials



	P	M	K	N	S	H	O
Uncoated			●	●●	●	●	●●

~DIN 371										
Designation Uncoated		D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	□ mm	l _g mm	N
81311-M8X1		MF 8x1	1	90	25	66	8	6,2	9	4
81311-M10X1		MF 10x1	1	90	30	62	10	8	11	4
81311-M14X1.5		MF 14x1.5	1,5	100	21	56	14	11	14	4
81311-M16X1.5		MF 16x1.5	1,5	100	21	55	16	12	15	4



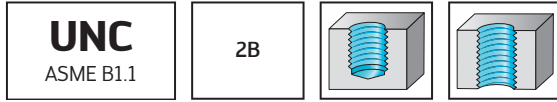
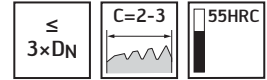
Without reduced neck after the thread

Solid carbide machine taps

Paradur® HS

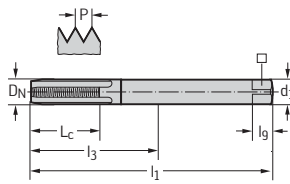


– For short-chipping materials



	P	M	K	N	S	H	O
TICN			●	●●	●	●	●●

~DIN 2184-1										
Designation TICN	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	□ mm	l ₉ mm	N	
8231106-UNC10	UNC 10-24	4,826	70	16	47	6	4,9	8	3	
8231106-UNC1/4	UNC 1/4-20	6,35	80	20	57	7	5,5	8	3	
8231106-UNC5/16	UNC 5/16-18	7,938	90	25	66	8	6,2	9	3	
8231106-UNC3/8	UNC 3/8-16	9,525	100	30	72	10	8	11	3	
8231106-UNC1/2	UNC 1/2-13	12,7	110	36	68	12	9	12	3	



Without reduced neck after the thread

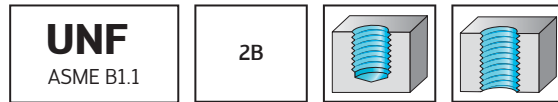
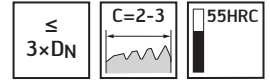
B5

Solid carbide machine taps

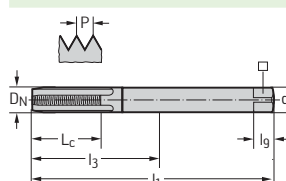
Paradur® HS



– For short-chipping materials

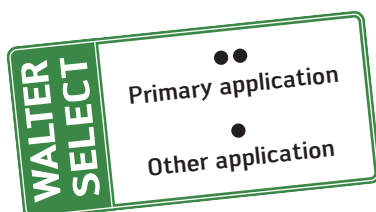


	P	M	K	N	S	H	O
TICN			●	●●	●	●	●●

~DIN 2184-1										
	Designation TICN	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	mm	l _g mm	N
	8331106-UNF10	UNF 10-32	4,826	70	16	47	6	4,9	8	3
	8331106-UNF1/4	UNF 1/4-28	6,35	80	20	57	7	5,5	8	3
	8331106-UNF5/16	UNF 5/16-24	7,938	90	25	66	8	6,2	9	3
	8331106-UNF3/8	UNF 3/8-24	9,525	90	30	62	10	8	11	3

Without reduced neck after the thread

B5

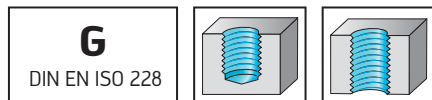
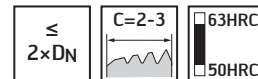


Solid carbide machine taps

Paradur® Hard Scraper

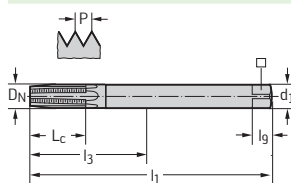


- For short-chipping materials
- Drill core hole 0.1-0.2 mm larger



	P	M	K	N	S	H	O
TICN					●	●●	

PROTOTYP TOOLS STANDARD



Designation TICN	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	mm	l ₉ mm	N
8431206-G1/8	G 1/8-28	9,728	28	90	23,5	62	10	8	11	5
8431206-G1/4	G 1/4-19	13,157	19	100	32,5	58	12	9	12	6

Without reduced neck after the thread

Thread cutting oils



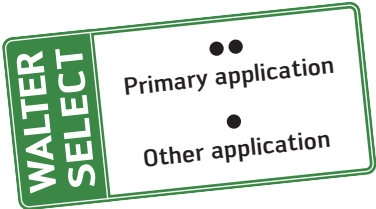
	P	M	K	N	S	H	O
Protofluid	••	••	••	•			
Hangsterfer's Hardcut					••	••	

Designation Protofluid*	Litres	Density at 15 °C in kg/m³	Viscosity at 40 °C in mm²/s	Flash point (COC) in °C	Pour point in °C
SP-1/4	0,25	884	23,4	195	- 15
SP-1/4-12	0,25 (× 12)				
SP-5	5				

* For general applications in thread cutting and thread forming

Designation Hangsterfer's Hardcut*	Litres	Density at 15 °C in kg/m³	Viscosity at 40 °C in mm²/s	Flash point (COC) in °C	Pour point in °C
SP-1/4	0,25	1065	21	196	- 4
SP-1	1				
SP-5	5				

* For steel, titanium and nickel alloys with difficult cutting properties as well as special materials



Tapping and thread forming cutting data

Material group	 = Cooling lubricant recommended E = Emulsion O = Oil v_c = Cutting speed Overview of the main material groups and code letters			Brinell hardness HB	Tensile strength R _m N/mm²	Machining group ¹	HSS-E (PM) taps				
							Uncoated				
							v _c [m/min]				
							1,5 × D _N	2 × D _N	2,5 × D _N		
P	Non-alloyed steel	C ≤ 0.25%	Annealed	125	430	P1	16	13	12	E	
		C > 0.25% to ≤ 0.55%	Annealed	190	640	P2	20	17	14	E	
		C > 0.25% to ≤ 0.55%	Heat-treated	210	710	P3	10	9	7	E	
		C > 0.55%	Annealed	190	640	P4	10	9	7	E	
		C > 0.55%	Heat-treated	300	1010	P5	6	5	4	E	
		Free cutting steel (short-chipping)	Annealed	220	750	P6	10	9	7	E	
	Low-alloyed steel	Annealed		175	590	P7	20	17	14	E	
		Heat-treated		285	960	P8	5	4	4	E	
		Heat-treated		380	1280	P9	3	3	2	E	
		Heat-treated		430	1480	P10	3	2	2	O	
	High-alloyed steel and high-alloyed tool steel	Annealed		200	680	P11	10	9	7	E	
		Hardened and tempered		300	1010	P12	6	5	4	E	
		Hardened and tempered		380	1280	P13	3	3	2	O	
	Stainless steel	Ferritic/martensitic, annealed		200	680	P14	3	2	2	E	
		Martensitic, heat-treated		330	1110	P15	3	2	2	E	
M	Stainless steel	Austenitic, quench hardened		200	680	M1	4	3	3	E	
		Austenitic, precipitation hardened (PH)		300	1010	M2	2	2	1	E	
		Austenitic/ferritic, duplex		230	780	M3	2	2	2	E	
K	Malleable cast iron	Ferritic		200	400	K1	10	9	7	E	
		Pearlitic		260	700	K2	7	5	5	E	
	Grey cast iron	Low tensile strength		180	200	K3	19	16	13	E	
		High tensile strength/austenitic		245	350	K4	13	10	9	E	
	Cast iron with spheroidal graphite	Ferritic		155	400	K5	10	9	7	E	
		Pearlitic		265	700	K6	7	5	5	E	
	GGV (CGI)			230	400	K7	6	5	4	E	
N	Wrought aluminium alloys	Not hardenable		30	–	N1	10	8	7	E	
		Hardenable, hardened		100	340	N2	19	16	13	E	
	Cast aluminium alloys	≤ 12% Si, not hardenable		75	260	N3	17	14	12	E	
		≤ 12% Si, hardenable, hardened		90	310	N4	17	14	12	E	
		> 12% Si, not hardenable		130	450	N5	16	13	11	E	
	Magnesium-based alloys			70	250	N6	26	21	19	O	
				100	340	N7	9	7	6	E	
		Copper and copper alloys (bronze/brass)	Brass, bronze, red brass		90	310	N8	24	21	18	E
Cu-alloys, short-chipping			110	380	N9	31	25	21	E		
High-tensile, Ampco			300	1010	N10	2			E		
S	Heat-resistant alloys	Fe-based	Annealed	200	680	S1	3	3	2	E	
			Hardened	280	940	S2	2	2	2	E	
		Ni or Co base	Annealed	250	840	S3	3	3	2	E	
			Hardened	350	1180	S4	2	2	2	O	
			Cast	320	1080	S5	2	2	2	O	
		Titanium alloys	Pure titanium		200	680	S6	10	8	7	E
	α and β alloys, hardened		375	1260	S7	3	2	2	O		
	β alloys		410	1400	S8	3	2	2	O		
	Tungsten alloys			300	1010	S9	2	2	2	O	
	Molybdenum alloys			300	1010	S10	5	5	4	O	
H	Hardened steel	Hardened and tempered		50 HRC	–	H1				O	
		Hardened and tempered		55 HRC	–	H2				O	
		Hardened and tempered		60 HRC	–	H3				O	
	Hardened cast iron	Hardened and tempered		55 HRC	–	H4				O	
O	Thermoplastics	Without abrasive fillers				O1	28	23	19	E	
	Thermosetting plastics	Without abrasive fillers				O2	11	9	8	E	
	Plastic, glass fibre reinforced	GFRP				O3	6	5	4	E	
	Plastic, carbon fibre reinforced	CFRP				O4	6	5	4	E	
	Plastic, aramid fibre reinforced	AFRP				O5	6	5	4	E	
	Graphite (technical)			80 Shore		O6	13	11	9	E	

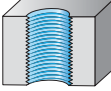
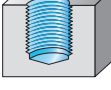
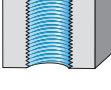
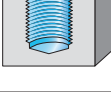
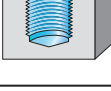
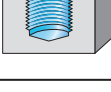
¹ The classification of the machining groups can be found from page B 1174 onwards.

The specified cutting data are average standard values.
For special applications, adjustment is recommended.

	HSS-E (PM) taps			Solid carbide taps							HSS-E thread formers						Solid carbide thread formers			
	Coated			Uncoated			Coated				Uncoated			Coated			Coated			
	v _c [m/min]										v _c [m/min]									
	1,5 × D _N	2 × D _N	2,5 × D _N	1,5 × D _N	2 × D _N	2,5 × D _N	1,5 × D _N	2 × D _N	2,5 × D _N	1,5 × D _N	2 × D _N	2,5 × D _N	1,5 × D _N	2 × D _N	2,5 × D _N	1,5 × D _N	2 × D _N	2,5 × D _N		
	37	30	26							E	17	14	12	46	37	32	58	48	41	E
	37	31	26				64			E	15	12	10	47	38	33	58	48	41	E
	23	19	17				64	52		E	10	9	7	29	23	20	47	38	33	E
	23	19	16				64	52		E	10	9	7	29	23	20	47	38	33	E
	14	12	10				56	46		E				17	14	12	28	23	19	E
	23	19	16				64	52		E	10	9	7	29	23	20	47	38	33	E
	37	30	26				64	52		E	15	12	10	47	38	33	58	48	41	E
	12	10	9				49	40		E				15	12	11	24	20	17	E
	7	6	5				37	30		E										
	5						26	21		O										
	23	19	16				64	52		E	10	9	7	29	23	20	47	38	33	E
	14	12	10				56	46		E				17	14	12	28	23	19	E
	7	6	5				37	30		O										
	7	6	5							E				13	10	9	26	21	18	E O
	5	4	3							E				5	4	3	15	12	10	O
	8	7	6							E				15	12	11	31	25	21	E O
	5	4	3							E				5	4	4	15	13	11	O
	6	5	4							E				5	4	4	15	13	11	E O
	22	18	16	29	24	20	50	41	33	E										
	11	9	8	17	14	12	34	28	22	E										
	44	36	32	46	38	33	73	60	51	E										
	17	14	12	17	14	12	45	37	31	E										
	22	18	16	29	24	20	42	34	28	E				29	23	20	52	43	37	E
	12	10	9	17	14	12	41	33	27	E				14	12	10	45	37	32	E
	10	8	7	14	11	10	33	27	23	E										
	8	7	6							E	25	20	17	56	45	39	81	67	57	E
	32	26	22							E	28	23	19	52	43	37	70	57	49	E
	22	18	16	41	33	28	89	73	63	E				48	39	34	70	57	49	E
	22	18	16	41	33	28	89	73	63	E				48	39	34	70	57	49	E
	25	21	18	35	29	24	70	57	49	E										
	34	28	24	44	36	31	90	74	63	O										
	14	12	10							E	10	8	7	21	17	15	46	38	33	E
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				11	9	8	11	9	8	E										
										E				8	6	5				E
	3									E				8	6	5				O
										E										
	3									O										
	3									O										
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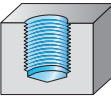
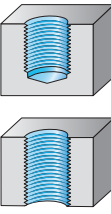
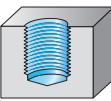
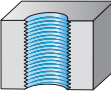
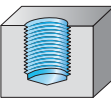
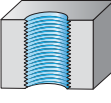
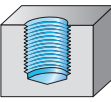
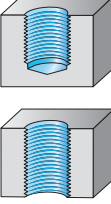
Type description

Taps for universal applications

Type description	Machining	Materials							Helix angle	Thread depth	Page
		P	M	K	N	S	H	O			
		Steel	Stainless steel	Cast iron	NF metals	Materials with difficult cutting properties	Hard materials	Other			
Prototex® Eco Plus  – For wet and MQL machining		●●	●●	●●	●●				0°	3,0 × D _N	B 742
Paradur® Eco Plus  – For wet and MQL machining		●●	●●	●●	●●				45°	3,0 × D _N	B 780
Prototex® Synchrospeed  – Synchronous machining – Shank tolerance h6		●●	●●	●●	●●	●●		●●	0°	3,0 × D _N	B 747
Paradur® Synchrospeed  – Synchronous machining – Shank tolerance h6		●●	●●	●●	●●	●		●	40°	2,5 × D _N	B 788
TC115  – Particularly cost-effective for small to medium batch sizes		●●	●●	●●	●				45°	3,0 × D _N	B 787
TC216  – Particularly cost-effective for small to medium batch sizes		●●	●●	●●	●●				0°	3,5 × D _N	B 746

- Primary application
- Additional application

Taps for special applications

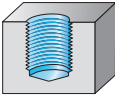
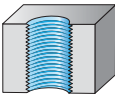
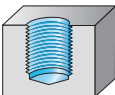
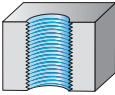
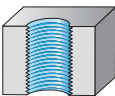
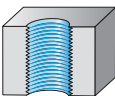
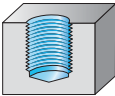
Type description	Machining	Materials							Helix angle	Thread depth	Page
		P	M	K	N	S	H	O			
		Steel	Stainless steel	Cast iron	NF metals	Materials with difficult cutting properties	Hard materials	Other			
TC142  – For stainless and high-strength steels with extremely high performance		•	••						50°	3,0 × D _N	B 809
Paradur® Eco CI  – For short-chipping materials – For wet and MQL machining				••	••			•	0°	3,0 × D _N	B 814
Paradur® HT  – For medium to high tensile steels and short-chipping materials – Internal cooling required		••		••	•			•	0°	3,5 × D _N	B 792
Prototex® X-pert P  – For materials with low to medium strength		••			•			•	0°	3,0 × D _N	B 750
Paradur® X-pert P  – For materials with low to medium strength		••			•			•	45°	3,5 × D _N	B 798
Prototex® X-pert M  – For stainless and high-strength steels		•	••						0°	3,0 × D _N	B 760
Paradur® X-pert M  – For stainless and high-strength steels		•	••						40°	2,5 × D _N	B 810
Paradur® X-pert K  – For cast iron workpieces				••	•				0°	3,0 × D _N	B 820

- Primary application
- Additional application

Type description

(continued)

Taps for special applications

Type description	Machining	Materials							Helix angle	Thread depth	Page
		P	M	K	N	S	H	O			
		Steel	Stainless steel	Cast iron	NF metals	Materials with difficult cutting properties	Hard materials	Other			
Paradur® X-pert N 	– For long-chipping aluminium materials 				●●	●		●	35°	3,0 × D _N	B 821
Prototex® X-pert N 	– For long-chipping aluminium materials 				●●	●		●	0°	3,0 × D _N	B 762
Paradur® Short Chip HT 	– For long-chipping materials 	●●		●	●				15°	4,0 × D _N	B 807
Prototex® TiNi Plus 	– For machining high tensile Ti materials that tend to cause jamming with emulsion 	●●	●●		●	●●			0°	2,0 × D _N	B 765
Paradur® Ti Plus 	– For machining high tensile Ti materials that tend to cause jamming with emulsion 	●●			●	●●			15°	2,0 × D _N	B 830
Prototex® HSC 	– For high-strength and high tensile steel materials up to 55 HRC – Shank tolerance h6 – Internal cooling required – Solid carbide 	●●		●●					0°	2,0 × D _N	B 989
Paradur® HSC 	– For high-strength and high tensile steel materials up to 55 HRC – Shank tolerance h6 – Internal cooling required – Solid carbide 	●●		●●			●●		15°	2,0 × D _N	B 990

- Primary application
- Additional application

Product families

Taps	
AP	For Ampco materials
Eco CI	For short-chipping cast iron and aluminium materials
Eco Plus	Product range for particularly cost-effective wet or minimum quantity lubrication (MQL) machining
Engine	For short-chipping cast iron and aluminium materials, made from solid carbide
FT	For titanium carbide hard materials
H	For soft materials
H24	Tool with higher number of flutes
Hard	For hard machining up to 63 HRC
HS	For abrasive, short-chipping materials
HSC	"High Speed Cutting", for high cutting speeds
HT	For steel with a tensile strength of 700-1400 N/mm ²
Inox 25	Designed specifically for manufacturing cap nuts
Insert	For manufacturing thread inserts
Megasprint	"Sprint" with internal coolant
MS	For short-chipping copper-zinc alloys
N	For steel with a tensile strength of 200-1000 N/mm ²
NH	For steel with a tensile strength of 400-1200 N/mm ²
Ni	For nickel alloys and similar materials
Ni 10	For materials with difficult cutting properties
OS	For thin steel and aluminium sheets
Secur	Problem-solver for birds nesting and swarf packing in soft, long-chipping materials with a tensile strength of up to 850 N/mm ²
Short Chip HT	Problem-solver for birds nesting and swarf packing in steel with a tensile strength of 850-1200 N/mm ²
Sprint	For a wide range of materials
STE	For steel with a tensile strength of 350-1200 N/mm ² and chamfer form E
Synchrospeed	Product range for synchronous machining
TC115	Blind hole taps for universal use – Perform line
TC142	Blind hole taps for stainless steels – Supreme line
TC216	Through hole taps for universal use – Perform line
Ti	For titanium alloys and similar materials
Ti Plus	Specially developed for titanium alloys with emulsion
TiNi	For titanium alloys and nickel alloys
TiNi Plus	Specially developed for titanium alloys and nickel alloys with emulsion
X-pert K	For grey cast iron and cast iron with spheroidal graphite
X-pert M	For stainless and high-strength steels
X-pert N	For long-chipping aluminium alloys
X-pert P	For steel materials with a tensile strength of 200-1000 N/mm ²

Grade description

Walter grade description	Standard designation	Materials							Range of applications								Coating process	Coating composition	Tool example		
		P	M	K	N	S	H	O	01	10	20	30	40	50	60	70				80	90
		Steel	Stainless steel	Cast iron	NF metals	Materials with difficult cutting properties	Hard materials	Other													
WY80FC	HSS-E	●●	●●	●	●													-	Vaporised		
WY80AA	HSS-E	●●	●●	●	●													PVD	TiN		
WW60RB	HSS-E-PM	●	●●															PVD	TiAlN		

- Primary application
- Additional application

Basic types

Blind hole thread

Straight-fluted taps – Short-chipping materials

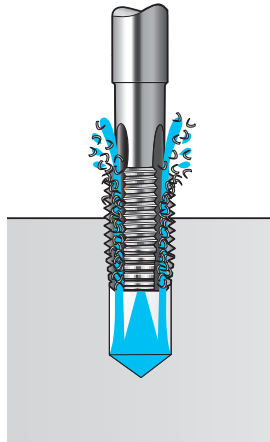
Straight-fluted taps do not transport chips. For this reason, they can only be used with short-chipping materials or short threads.

Note:

The chips accumulate at the bottom of the drilled hole if internal coolant is not used. If the safety margin at the bottom of the hole is too small, the tool can run up against the chips and break.

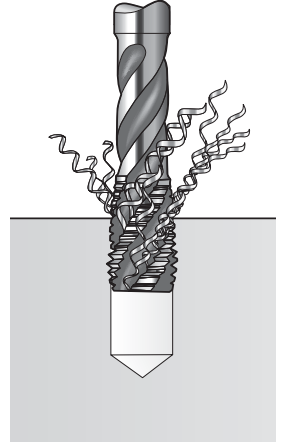
Deeper threads are possible with straight-fluted tools if the tap has an axial coolant supply, because the chips are flushed out against the direction of feed. However, a requirement for this is that the chips are broken short (e.g. Paradur® HT, thread depth of up to $3.5 \times D_N$). In comparison to helical tools, straight-fluted taps have a longer tool life.

Some straight-fluted tools can also be used for through-hole threads in materials with good chip breaking properties (e.g. Paradur® Eco CI, Paradur® X-pert K, Paradur® Hard).



Right-hand spiral taps – Long-chipping materials

Right-hand spiral taps transport chips towards the shank. The tougher the material to be machined is (and/or the longer the chips it produces) and the deeper the thread, the greater the helix angle required (e.g. TC142, Paradur® Eco Plus).



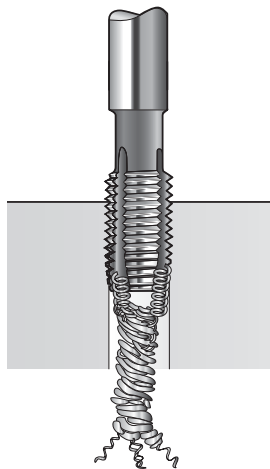
B5

Through-hole threads

Taps with spiral point – Long-chipping materials

Taps with a spiral point transport the chips forward in the direction of feed.

Taps with a spiral point are the first choice for creating through-hole threads in long-chipping materials (e.g. TC216, Prototex® Eco Plus).

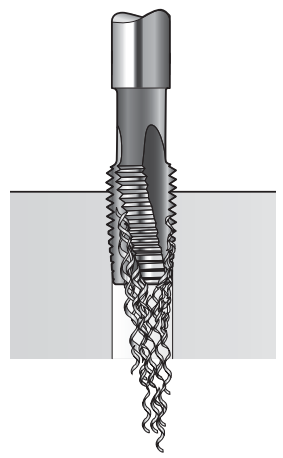


Left-hand spiral taps – Long-chipping materials

Left-hand spiral taps (and taps with a spiral point) transport the chips forward in the direction of feed.

Tools with left-hand spiral are practical if chips cannot be removed reliably with a spiral point alone.

Tool example:
Paradur® N of type 20411 and 20461

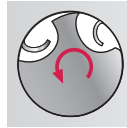


Thread cutting process

Cutting process for blind hole threads



1. The cutting tap comes to a stop. At the point at which it comes to a stop, all cutting edges in the chamfer/lead are in the process of forming chips.



2. The tool begins to reverse. The resulting chips remain where they are for the time being. The reverse torque at this point is virtually zero.



3. When the tap reverses, the chips come into contact with the back of the trailing land. The reverse torque increases sharply. The chips now have to be shorn off. As the chamfer/lead of the tap has a clearance angle and the conical chamfer/lead withdraws from the thread axially when it backs out of the hole, the purchase point is no longer directly at the root of the chips. For this reason, the chips require a certain level of stability (thickness) to ensure a clean break.



4. The chips have been shorn off and reverse torque decreases to the level of friction between the guide part and the cut thread.

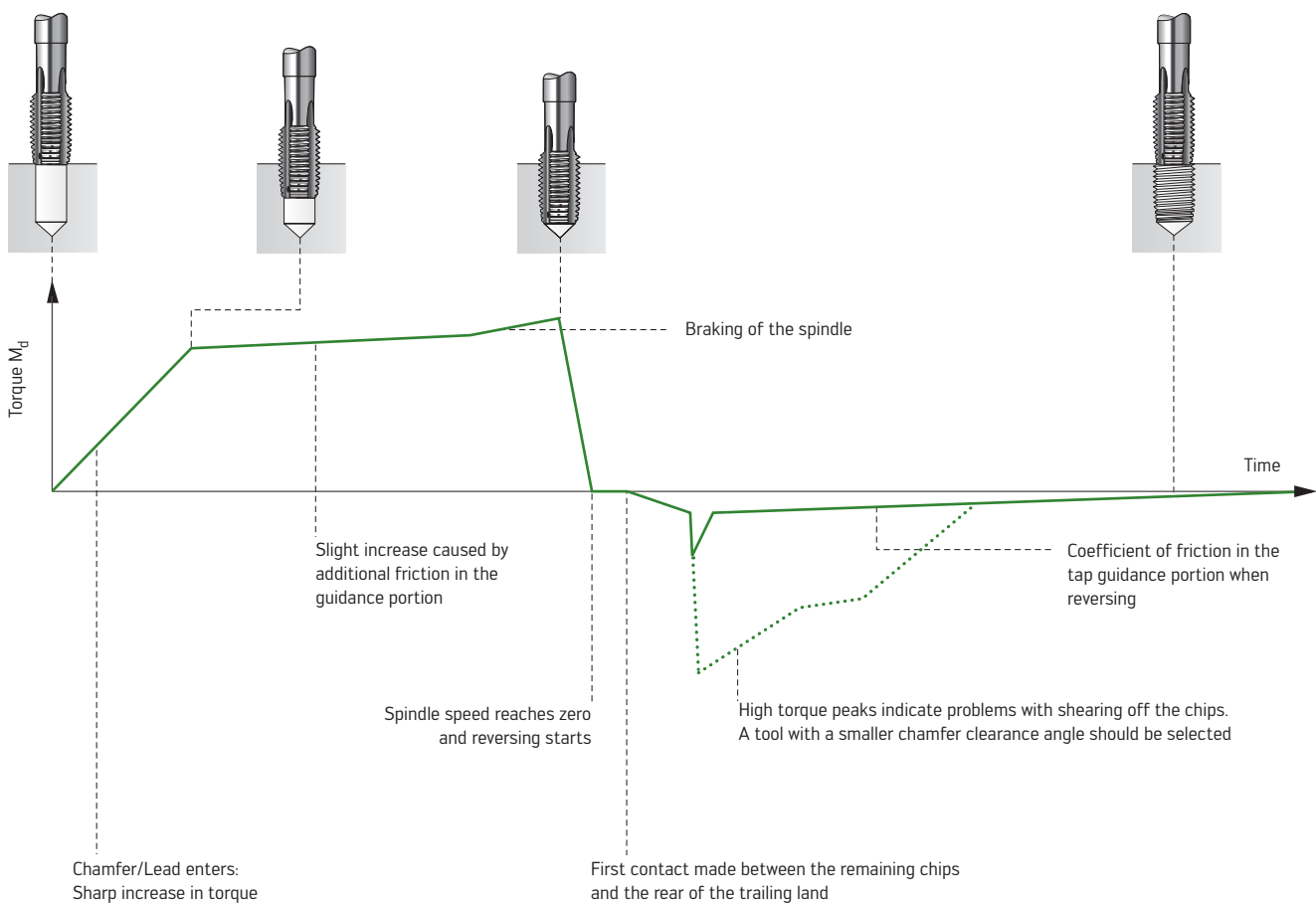
Note:

Through hole taps cannot be used for blind hole machining, as these have a high chamfer/lead clearance angle. The result: The chips may not be shorn off, and may instead become jammed between the chamfer and the thread. This could lead to fractures in the chamfer and, in extreme cases, to tap breakage.

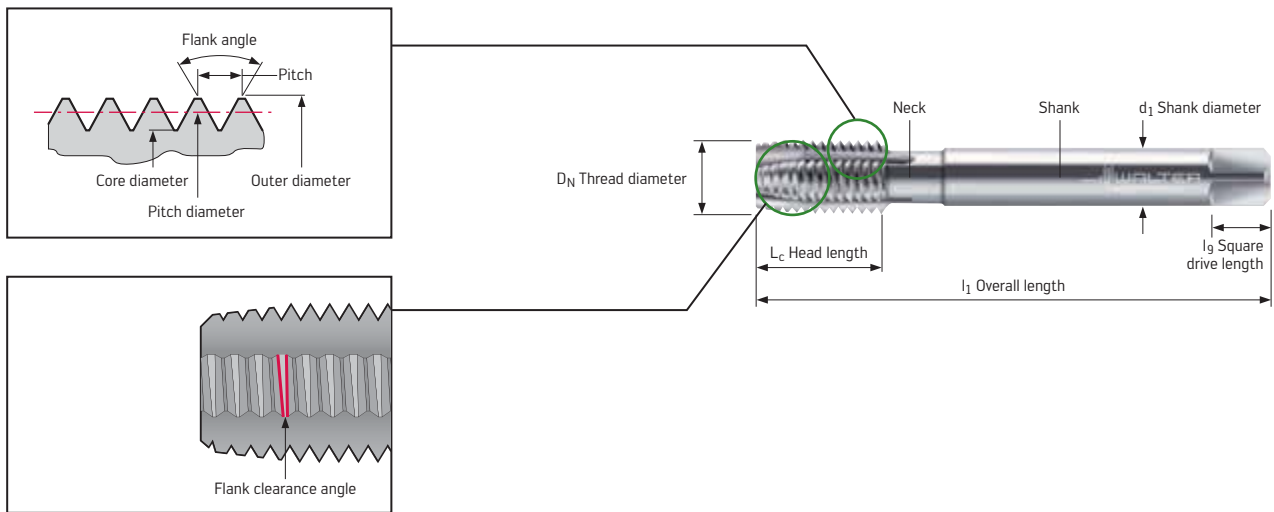
The chamfer clearance angle of blind hole taps is always smaller than that of through hole taps, because blind hole taps must shear off the chip root when reversing.

B5

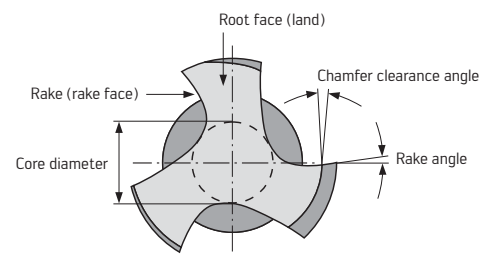
Torque curve during the blind hole thread tapping process



Angles and characteristics

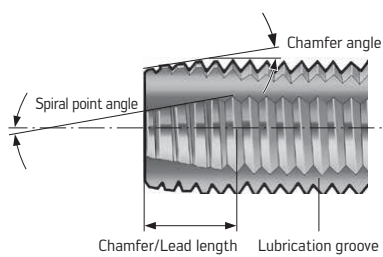


Features (view from above)

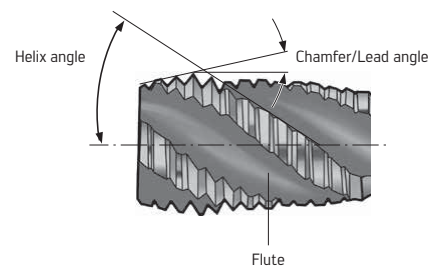


B5

Through hole tap with a spiral point



Blind hole tap with a right-hand helix

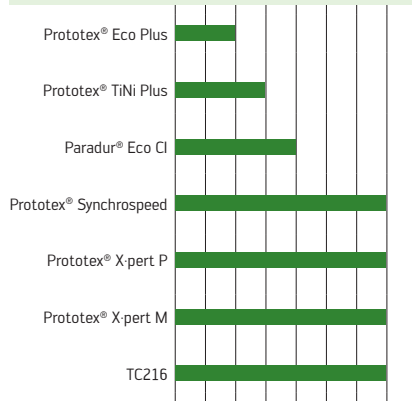


Angles and characteristics

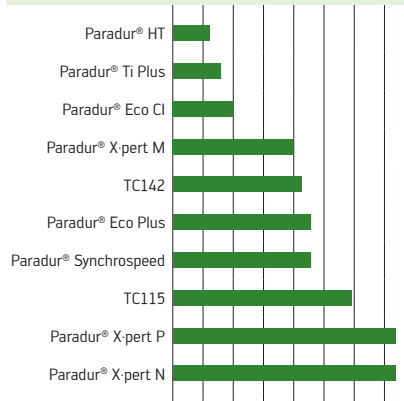
(continued)

Comparison of geometry data

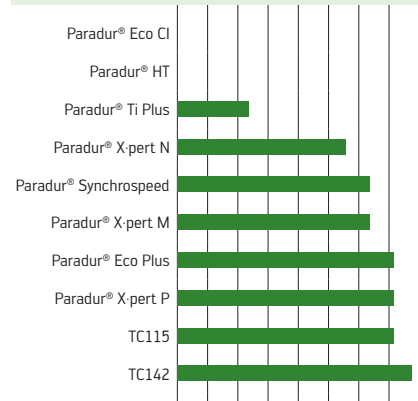
Rake angle of through hole taps



Rake angle of blind hole taps



Helix angle of blind hole taps



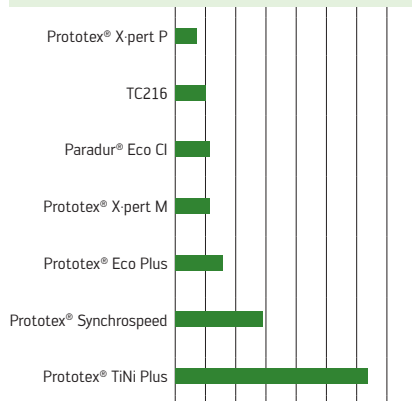
A smaller **rake angle**:

- Increases the stability of the cutting edges (large rake angles could cause fractures around the chamfer/lead)
- Generally produces more controllable chips
- Produces poorer-quality surfaces on the component
- Increases the cutting forces and the cutting torque
- Is required for machining hard and abrasive materials
- Increases the tendency to compress the material to be machined, i.e. the tap cuts less freely and therefore creates slightly tighter threads

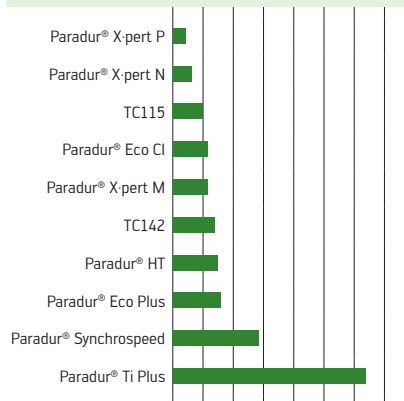
A larger **helix angle**:

- Facilitates chip removal
- Reduces the stability of the tool and thereby limits the maximum cutting torque
- Reduces the stability of the teeth
- Reduces the tool life
- Enables deeper threads

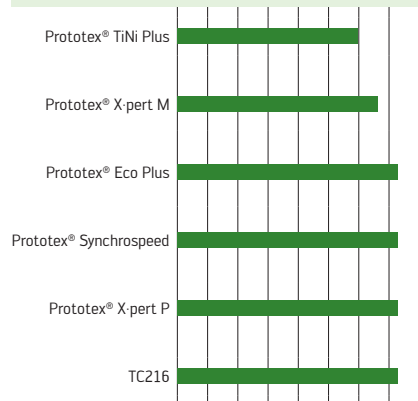
Through hole tap flank clearance angle



Blind hole tap flank clearance angle



Through hole tap spiral point angle



The **flank clearance angle** must be matched to the material to be machined. Materials with a higher strength and materials that tend to cause jamming require a larger flank clearance angle. The guidance characteristics of the tool worsen as the clearance angle is increased, which is why miscutting occurs in soft materials if compensating chucks are used.

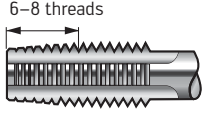
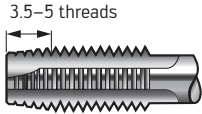
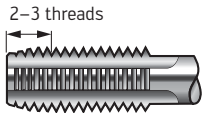
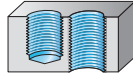
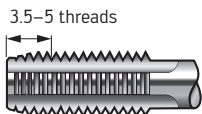
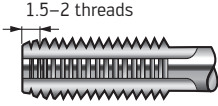
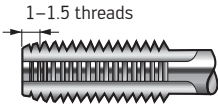
The **spiral point angle** is limited by the chamfer/lead length and the number of flutes, because a larger spiral point angle causes the land width in the first thread of the chamfer/lead to be reduced. The result: The stability of the cutting edge decreases (the risk of fractures around the chamfer increases). However, an increased spiral point angle facilitates chip removal in the direction of feed. If the spiral point angle is too small, chip removal can become problematic. Left-hand helical tools provide a solution for this.

Chamfer clearance angle:

Through hole taps have a chamfer clearance angle approx. three times larger than blind hole taps.

Chamfer/Lead forms

Chamfer forms based on DIN 2197

Form	Number of threads in the chamfer/lead	Design of the flutes	Blind hole/through hole machining	Used predominantly for
A		Straight-fluted		Short-chipping materials
				Short through-hole thread in medium-chipping and longchipping materials
B		Straight-fluted with a spiral point		Medium-chipping and long-chipping materials
C		Right-hand helical		Medium-chipping and long-chipping materials
		Straight-fluted		Short-chipping materials
D		Left-hand helical		Long-chipping materials
		Straight-fluted		Short-chipping materials
E		Right-hand helical		Short thread run-out in medium-chipping and long-chipping materials
		Straight-fluted		Short thread run-out in short-chipping materials
F		Right-hand helical		Very short thread run-out in medium-chipping and long-chipping materials
		Straight-fluted		Very short thread run-out in short-chipping materials

Please note:

Longer chamfers/leads:

- Increase the tool life
- Reduce the strain on the cutting edge
- Increase the required torque

Shorter chamfers/leads:

- Enable the thread to almost reach the bottom of the hole
- Facilitate chip formation

Modifications

	Negative chamfer (Secur chamfer)	Shortened chamfer	Reduced helix in the chamfer	Inclined thread	Uncoated rake
					
Chip formation	Chips are rolled more tightly, shorter chips	Chips are rolled more tightly, fewer chips	Chips are rolled more tightly, shorter chips	No change	Chips are rolled more tightly, shorter chips
Tool life quantity	+	- -	uncoated: - coated: +	+	-
Thread quality	-	-	uncoated: - - coated: □	□	-
Chip thickness	□	+	□	□	□
Torque	+	-	-	-	□
Application example	Prevention of bird nesting in soft steels such as St52, C45, etc.	Thread nearly to the bottom of the hole, improved chip control	Optimised chip formation in steels and aluminium wrought alloys	Problems with fractures or weld formations in the guide part	Optimised chip formation in steels, crankshaft machining
Standard tools with appropriate modification	Paradur® Secur Paradur® HSC Prototex® HSC	All tools with E/F chamfer form	Paradur® Short Chip HT Paradur® Ni 10 Paradur® HSC	TC142 Paradur® Eco Plus Paradur® X-pert M Paradur® Synchrospeed	All uncoated tools as well as Paradur® Synchrospeed (TiN-vap)

+ increases

□ remains unchanged

- decreases

- - decreases sharply

Solutions

Thread surface

The thread surface is determined by:

- The production process: Drilling, forming, milling
- The wear on the tool
- The geometry
- The coating
- The material to be machined
- The cooling lubricant and its availability in the operating area of the tool

Note:

In tapping and thread forming, there is almost no possibility to influence the surface quality via the cutting data. In contrast to this, the cutting speed and feed rate can be selected independently of each other for thread milling.

Optimisation of the thread surface during thread cutting

- Use thread forming or thread milling instead of tapping
- Increase the rake angle
- Decreased chip thickness via a longer chamfer or an increased number of flutes (with blind hole taps, this nevertheless worsens the chip formation)
- In general, TiN and TiCN produce the best surfaces in steel (uncoated tools or CrN and DLC layers produce the best surfaces in aluminium)
- Increase the oil content of the emulsion or only use oil
- Supply cooling lubricant directly to the operating area
- Replace the tool with a new one earlier

Some of the suggested measures might lead to an improvement in the surface quality, but are accompanied by a worsening in chip control – which is problematic with deep blind holes in particular. It is therefore important to select a compromise that takes the customer's requirements into account.



Tap with TiCN layer in AISi7



Tap with DLC layer in AISi7

B 5

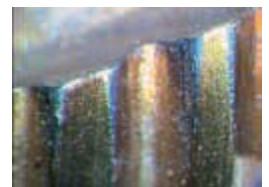
Wear

A high level of hardness ensures high resistance to wear – and therefore a long tool life. However, increasing the hardness generally also leads to reduced toughness.

However, small dimensions and high-spiralled tools require a high level of toughness, because otherwise total breakage can occur.

The hardness of the tool can normally be increased without difficulty for thread formers, straight-fluted and low-spiralled tools, as well as for machining abrasive materials with a low strength.

Solid carbide tools are characterised by a particularly high degree of hardness.



Example of abrasive wear

Weld formations on the tool

Special coatings and surface treatments are recommended to solve problems depending on the material to be machined:

- Aluminium and aluminium alloys: Uncoated, CrN, DLC
- Soft steels and stainless steels: vap
- Soft structural steels: CrN

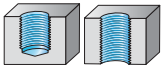


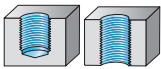
Example of weld formations

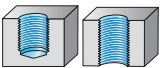


HSS-E and solid carbide thread formers	Product range overview	B 1024
	Designation key	B 1027
	Walter Select – HSS-E and solid carbide thread formers	B 1028
	M – Metric thread	B 1034
	MF – Metric fine-pitch thread	B 1062
	UNC / UNF	B 1072
	G	B 1074
Technical information	Cutting data	B 1008
	Type description	B 1076
	Product families	B 1077
	Thread forming process	B 1078
	Modifications	B 1080
	Solutions	B 1081

HSS-E and solid carbide thread formers product range overview M – Metric thread

Machining						
Thread depth	$2 \times D_N$	$3 \times D_N$				$3,5 \times D_N$
Designation	Protodyn® Eco LM	Protodyn® Eco Plus	Protodyn® Plus	Protodyn® Plus	Protodyn® C	Protodyn® S Eco Plus
Dimension range	M 2–M 12	M 2–M 20	M 1–M 24	M 3 LH–M 16 LH	M 1–M 10	M 2–M 20
Tolerance	6HX	6HX / 6GX	6HX / 6GX / 7GX	6HX	6HX / 6GX	6HX / 6GX
Coolant supply	External	External	External	External	External	External / radial
Chamfer/Lead form	C	C	C	C	C	C / E
Coating/grade	CRN	TIN / TICN	TIN	TIN	nid / uncoated	TIN / TICN
Cutting tool material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
Page	B 1045	B 1034	B 1046	B 1047	B 1053	B 1037
						

Machining						
Thread depth	$3,5 \times D_N$					
Designation	Protodyn® S Synchrospeed	Protodyn® S Eco Inox	Protodyn® S Plus	Protodyn® SC	Protodyn® SF	Protodyn® HSC
Dimension range	M 3–M 12	M 2–M 12	M 2–M 24	M 3–M 10	M 3–M 16	M 3–M 10
Tolerance	6HX	6HX	6HX / 6GX / 7GX	6HX / 6GX	6HX	6HX
Coolant supply	External / radial	External	External	External	External	External
Chamfer/Lead form	C	C	C	C	C	C
Coating/grade	TIN / TICN	TIN	TIN	nid / uncoated	TICN	TICN
Cutting tool material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	Solid carbide
Page	B 1042	B 1044	B 1050	B 1055	B 1057	B 1058
						

Machining				
Thread depth	$3,5 \times D_N$	$3 \times D_N$	$3,5 \times D_N$	
Designation	Protodyn® S HSC	Protodyn® Eco Plus	Protodyn® S Eco Plus	Protodyn® S HSC
Dimension range	M 6–M 10	M 5–M 16	M 2–M 16	M 6–M 10
Tolerance	6HX	6HX	6HX / 6GX	6HX
Coolant supply	Radial	Axial	External	Axial
Chamfer/Lead form	C	C	E	C / E
Coating/grade	TICN	TIN / TICN	TIN / TICN	TICN
Cutting tool material	Solid carbide	HSS-E	HSS-E	Solid carbide
Page	B 1061	B 1035	B 1039	B 1059
				

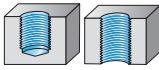
HSS-E and solid carbide thread formers product range overview

MF – Metric fine-pitch thread

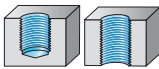
Machining						
Thread depth	$3,5 \times D_N$					$3 \times D_N$
Designation	Protodyn® S Eco Plus	Protodyn® S Synchrospeed	Protodyn® S Plus	Protodyn® SF	Protodyn® S HSC	Protodyn® Eco Plus
Dimension range	MF 8x1– MF 16x1.5	MF 8x1– MF 16x1.5	MF 4x0.5– MF 30x1.5	MF 8x1– MF 16x1.5	MF 12x1.5– MF 16x1.5	MF 8x1– MF 14x1.5
Tolerance	6HX / 6GX	6HX	6HX / 6GX	6HX	6HX	6HX
Coolant supply	External / radial	External	External	External	Radial	Axial
Chamfer/Lead form	C	C	C / E	C	C	C
Coating/grade	TIN / TiCN	TIN	TIN	TiCN	TiCN	TIN
Cutting tool material	HSS-E	HSS-E	HSS-E	HSS-E	Solid carbide	HSS-E
Page	B 1063	B 1066	B 1067	B 1069	B 1071	B 1062
						

Machining	
Thread depth	$3,5 \times D_N$
Designation	Protodyn® S HSC
Dimension range	MF 8x1– MF 16x1.5
Tolerance	6HX
Coolant supply	Axial
Chamfer/Lead form	C
Coating/grade	TiCN
Cutting tool material	Solid carbide
Page	B 1070
	

HSS-E and solid carbide thread formers product range overview UNC/UNF

Machining		
Thread depth	$3,5 \times D_N$	
Designation	Protodyn® S Plus	Protodyn® S Plus
Dimension range	UNC 2-56– UNC 5/8-11	UNF 2-64– UNF 5/8-18
Tolerance	2BX	2BX
Coolant supply	External	External
Chamfer/Lead form	C	C
Coating/grade	TIN	TIN
Cutting tool material	HSS-E	HSS-E
Page	B 1072	B 1073
		

HSS-E and solid carbide thread formers product range overview G

Machining		
Thread depth	$3,5 \times D_N$	
Designation	Protodyn® S Plus	Protodyn® SF
Dimension range	G 1/8-28– G 1"-11	G 1/8-28– G 1/2-14
Tolerance	NORMAL	NORMAL
Coolant supply	External	External
Chamfer/Lead form	C	C
Coating/grade	TIN	TICN
Cutting tool material	HSS-E	HSS-E
Page	B 1074	B 1075
		

HSS-E and solid carbide thread formers designation key

Example:

H	P	8	0	6	1	7	4	6
1	2	3	4	5	6	7	8	9

1	2	3	4	5
Tool range	Tool generation	Tool type	Thread type	Design
A ANSI E Eco S Synchrospeed D Protodyn® H HSC machining	P Plus	2 HSS-E thread formers 8 Solid carbide thread formers	0 Metric 1 Metric fine 2 UNC 3 UNF 4 G	6 Protodyn®

6	7	8	9
Tolerance/shank	Version of lubrication grooves	Modification	Surface treatment
1 6HX, 2BX Reinforced shank 3 6GX Reinforced shank 4 7GX Reinforced shank 6 6HX, 2BX, G-X Reduced shank 8 6GX Reduced shank 9 7GX Reduced shank	0 Without lubrication grooves (chamfer form = D) 1 Without lubrication grooves 7 With lubrication grooves	0 None 1 Internal coolant supply, axial outlet 4 Internal coolant supply, radial outlet	0 None 1 NID 4 CRN 5 TiN 6 TiCN

B 6

Walter Select – HSS-E and solid carbide thread formers

Step by step to the right tool

STEP 1

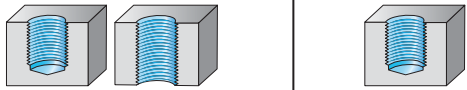
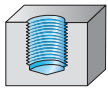
Determine the **material** to be machined from page B 1174 onwards:

Note the **machining group** that corresponds to your material, e.g.: P10.

Code letters	Machining groups	Groups of the materials to be machined	
P	P1–P15	Steel	All types of steel and steel casting, with the exception of steel with an austenitic structure
M	M1–M3	Stainless steel	Austenitic stainless steel, austenitic-ferritic steel and steel casting
K	K1–K7	Cast iron	Grey cast iron, cast iron with spheroidal graphite, malleable cast iron, cast iron with vermicular graphite
N	N1–N10	NF metals	Aluminium and other non-ferrous metals, non-ferrous materials
S	S1–S10	Materials with difficult cutting properties	Heat-resistant special alloys based on iron, nickel and cobalt, titanium and titanium alloys
H	H1–H4	Hard materials	Hardened steel, hardened cast iron materials, chilled cast iron
O	O1–O6	Other	Plastics, glass and carbon fibre reinforced plastics, graphite

STEP 2

Select your intended **application** from the table.

Thread forming HSS-E/solid carbide					
					
Thread depth	$2,0 \times D_N$	$3,0 \times D_N$	$3,5 \times D_N$	$3,0 \times D_N$	$3,5 \times D_N$
Page	B 1030	B 1030	B 1031	B 1033	B 1033

STEP 3

Select your **tool** from the table from page B 1030 onwards, based on the following criteria:

- Material group
- Thread type
- Thread depth

Walter Select HSS-E and solid carbide thread formers												
Material group	 Primary application Other application			Overview of the main material groups and code letters								
Machining				Thread depth			2 × D _N					
Designation				Protodyn® Eco LM			Protodyn® Eco Plus					
Coolant supply				External			External					
Cutting tool material				HSS-E			HSS-E					
Coating/grade				CRN			TiN / TiCN					
Thread type / Page				M B 1045			M B 1034					
				Thread hardness (H) Tensile strength R _m N/mm²								
				Machining group								
P	Non-alloyed steel	C ≤ 0.25%	Annealed	125	430	P1	●●	●●				
		C > 0.25% ≤ 0.55%	Annealed	190	640	P2	●●	●●				
		C > 0.25% ≤ 0.55%	Heat-treated	210	710	P3	●●	●●				
		C ≤ 0.55%	Annealed	190	640	P4	●●	●●				
		C > 0.55%	Heat-treated	300	1010	P5	●●	●●				
	Low-alloyed steel	Free cutting steel (short-chipping)	Annealed	220	750	P6	●●	●●				
		Annealed		175	590	P7	●●	●●				
		Heat-treated		285	960	P8	●●	●●				
		Heat-treated		380	1280	P9	●●	●●				
		Heat-treated		430	1480	P10	●●	●●				
M	High-alloyed steel and high-alloyed tool steel	Annealed		200	680	P11	●●	●●				
		Hardened and tempered		300	1010	P12	●●	●●				
		Hardened and tempered		380	1280	P13	●●	●●				
		Ferritic/martensitic, annealed		200	680	P14	●●	●●				
		Martensitic, heat-treated		330	1110	P15	●●	●●				
	Stainless steel	Austenitic, quench hardened		200	680	M1	●●	●●				
		Austenitic, precipitation hardened (PH)		300	1010	M2	●●	●●				
		Austenitic/ferritic, duplex		230	780	M3	●●	●●				
		Ferritic		200	400	K1						
		Pearlitic		260	700	K2						
K	Malleable cast iron	Low tensile strength		180	200	K3						
	Grey cast iron	High tensile strength/austenitic		245	350	K4						
	Cast iron											

STEP 4

The corresponding page in the catalogue is specified following tool selection.

At the bottom right of the catalogue page, you will find a reference to the **cutting data table**.

HSS-E machine thread formers

Protodyn® Eco Plus

– For long-chipping materials



M
DIN 13

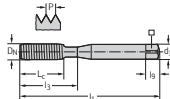
6HX




$\leq 3 \times DN$	$C=2-3$	36HRC 1200 ~200 N/mm²
		

P	M	K	N	S	H	O
TICN	•	•	•	•	•	•
TIN	•	•	•	•	•	•

DIN 2174



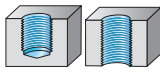
Designation TICN	Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
EP2061106-M2	EP2061105-M2	M 2	0.4	45	6	11	2.8	2.1	5	3
EP2061106-M2.5	EP2061105-M2.5	M 2.5	0.45	50	8	14	2.8	2.1	5	3
EP2061106-M3	EP2061105-M3	M 3	0.5	56	9	18	3.5	2.7	6	4
EP2061106-M3.5	EP2061105-M3.5	M 3.5	0.6	56	11	20	4	3	6	4
EP2061106-M4	EP2061105-M4	M 4	0.7	63	12	21	4.5	3.4	6	5
EP2061106-M5	EP2061105-M5	M 5	0.8	70	13	25	6	4.9	8	5
EP2061106-M6	EP2061105-M6	M 6	1	80	15	30	6	4.9	8	5
EP2061106-M8	EP2061105-M8	M 8	1.25	90	18	35	8	6.2	9	5
EP2061106-M10	EP2061105-M10	M 10	1.5	100	20	39	10	8	11	5

STEP 5

Select the **cutting data** for the tool type from page B 1008 onwards.

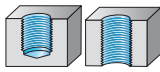
Material group	 = Cooling lubricant recommended E = Emulsion O = Oil vc = Cutting speed	Overview of the main material groups and code letters							
		Brook hardness HB	Tensile strength R_m N/mm ²	Machining group ¹	HSS-E (PM) taps				
					Uncoated				
					$1.5 \times D_N$	$2 \times D_N$	$2.5 \times D_N$		
v_c [m/min]									
P Non-alloyed steel Low-alloyed steel High-alloyed steel and high-alloyed tool steel Stainless steel	$C \leq 0.25\%$	Annealed	125	430	P1	16	13	12	E
	$C > 0.25\%$ to $\leq 0.55\%$	Annealed	190	640	P2	20	17	14	E
	$C > 0.55\%$ to $\leq 0.99\%$	Heat-treated	210	710	P3	10	9	7	E
	$C > 0.99\%$	Annealed	190	640	P4	10	9	7	E
	$C > 0.99\%$	Heat-treated	300	1010	P5	6	5	4	E
	Free cutting steel (short-chipping)	Annealed	220	750	P6	10	9	7	E
	Annealed	175	590	P7	20	17	14	E	
	Heat-treated	285	960	P8	5	4	4	E	
	Heat-treated	380	1280	P9	3	3	2	E	
	Heat-treated	430	1480	P10	3	2	2	O	
	Annealed	200	680	P11	10	9	7	E	
	Hardened and tempered	300	1010	P12	6	5	4	E	
Hardened and tempered	380	1280	P13	3	3	2	O		
Ferritic/martensitic, annealed	200	680	P14	3	2	2	E		
Martensitic, heat-treated	330	1110	P15	3	2	2	E		

Walter Select HSS-E and solid carbide thread formers

Material group	WALTER SELECT Primary application Other application Overview of the main material groups and code letters				Machining						
					Thread depth			2 × D _N	3 × D _N		
					Designation			Protodyn® Eco LM	Protodyn® Eco Plus		
					Coolant supply			External	External		
					Cutting tool material			HSS-E	HSS-E		
					Coating/grade			CRN	TIN / TiCN		
					Thread type Page			M B 1045	M B 1034		
					Brinell hardness HB	Tensile strength R _m N/mm²	Machining group				
					P	Non-alloyed steel	C ≤ 0.25%	Annealed	125	430	P1
C > 0.25... ≤ 0.55%	Annealed	190	640	P2				••			
C > 0.25... ≤ 0.55%	Heat-treated	210	710	P3				••			
C > 0.55%	Annealed	190	640	P4				••			
C > 0.55%	Heat-treated	300	1010	P5				••			
Free cutting steel (short-chipping)	Annealed	220	750	P6				••			
Low-alloyed steel	Annealed		175	590		P7		••			
	Heat-treated		285	960		P8		••			
	Heat-treated		380	1280		P9					
	Heat-treated		430	1480		P10					
High-alloyed steel and high-alloyed tool steel	Annealed		200	680		P11		••			
	Hardened and tempered		300	1010		P12		••			
	Hardened and tempered		380	1280		P13					
Stainless steel	Ferritic/martensitic, annealed		200	680		P14		••			
	Martensitic, heat-treated		330	1110		P15		••			
M	Stainless steel	Austenitic, quench hardened		200	680	M1		••			
		Austenitic, precipitation hardened (PH)		300	1010	M2		••			
		Austenitic/ferritic, duplex		230	780	M3		••			
K	Malleable cast iron	Ferritic		200	400	K1					
		Pearlitic		260	700	K2					
	Grey cast iron	Low tensile strength		180	200	K3					
		High tensile strength/austenitic		245	350	K4					
	Cast iron with spheroidal graphite	Ferritic		155	400	K5		••			
		Pearlitic		265	700	K6		•			
	GGV (CGI)			230	400	K7					
N	Wrought aluminium alloys	Not hardenable		30	-	N1	••	••			
		Hardenable, hardened		100	340	N2	••	••			
	Cast aluminium alloys	≤ 12% Si, not hardenable		75	260	N3	••	••			
		≤ 12% Si, hardenable, hardened		90	310	N4	••	••			
		> 12% Si, not hardenable		130	450	N5					
	Magnesium-based alloys			70	250	N6					
		Copper and copper alloys (bronze/brass)	Non-alloyed, electrolytic copper		100	340	N7	••	••		
			Brass, bronze, red brass		90	310	N8				
			Cu-alloys, short-chipping		110	380	N9				
	High-tensile, Ampco		300	1010	N10						
S	Heat-resistant alloys	Fe-based	Annealed	200	680	S1		••			
			Hardened	280	940	S2					
		Ni or Co base	Annealed	250	840	S3		••			
			Hardened	350	1180	S4					
			Cast	320	1080	S5					
	Titanium alloys	Pure titanium		200	680	S6	••				
		α and β alloys, hardened		375	1260	S7	••				
		β alloys		410	1400	S8					
	Tungsten alloys			300	1010	S9					
Molybdenum alloys			300	1010	S10						
H	Hardened steel			<63 HRC	-	H1-H4					
O	Plastics, graphite					01-06					

B 6

Walter Select HSS-E and solid carbide thread formers

Material group	WALTER SELECT Primary application Other application Overview of the main material groups and code letters						Machining									
							Thread depth			3,5 × D _N						
							Designation			Protodyn® SF		Protodyn® HSC				
							Coolant supply			External		External				
							Cutting tool material			HSS-E		Solid carbide				
							Coating/grade			TICN		TICN				
							Thread type Page			M MF G		B 1057 B 1069 B 1075		M B 1058		
							Brinell hardness HB			Tensile strength R _m N/mm²		Machining group				
							P	Non-alloyed steel	C ≤ 0.25%	Annealed	125	430	P1	●●	●●	
C > 0.25... ≤ 0.55%	Annealed	190	640	P2	●●	●●										
C > 0.25... ≤ 0.55%	Heat-treated	210	710	P3	●●	●●										
C > 0.55%	Annealed	190	640	P4	●●	●●										
C > 0.55%	Heat-treated	300	1010	P5	●●	●●										
Free cutting steel (short-chipping)	Annealed	220	750	P6	●●	●●										
Low-alloyed steel	Annealed		175	590	P7	●●		●●								
	Heat-treated		285	960	P8	●●		●●								
	Heat-treated		380	1280	P9											
	Heat-treated		430	1480	P10											
High-alloyed steel and high-alloyed tool steel	Annealed		200	680	P11	●●		●●								
	Hardened and tempered		300	1010	P12	●●		●●								
	Hardened and tempered		380	1280	P13											
Stainless steel	Ferritic/martensitic, annealed		200	680	P14	●●		●								
	Martensitic, heat-treated		330	1110	P15	●●		●								
	M	Stainless steel	Austenitic, quench hardened		200	680	M1	●●	●							
Austenitic, precipitation hardened (PH)				300	1010	M2	●●	●								
Austenitic/ferritic, duplex				230	780	M3	●●	●								
K			Malleable cast iron	Ferritic		200	400	K1								
	Pearlitic			260	700	K2										
	Grey cast iron	Low tensile strength		180	200	K3										
		High tensile strength/austenitic		245	350	K4										
	Cast iron with spheroidal graphite	Ferritic		155	400	K5	●●	●●								
		Pearlitic		265	700	K6	●	●								
	GGV (CGI)			230	400	K7										
N	Wrought aluminium alloys	Not hardenable		30	-	N1	●●	●●								
		Hardenable, hardened		100	340	N2	●●	●●								
	Cast aluminium alloys	≤ 12% Si, not hardenable		75	260	N3	●●	●●								
		≤ 12% Si, hardenable, hardened		90	310	N4	●●	●●								
		> 12% Si, not hardenable		130	450	N5										
	Magnesium-based alloys			70	250	N6										
		Copper and copper alloys (bronze/brass)	Non-alloyed, electrolytic copper		100	340	N7		●●							
			Brass, bronze, red brass		90	310	N8									
			Cu-alloys, short-chipping		110	380	N9									
			High-tensile, Ampco		300	1010	N10									
S	Heat-resistant alloys	Fe-based	Annealed	200	680	S1	●●									
			Hardened	280	940	S2										
		Ni or Co base	Annealed	250	840	S3	●●									
			Hardened	350	1180	S4										
			Cast	320	1080	S5										
	Titanium alloys	Pure titanium		200	680	S6										
		α and β alloys, hardened		375	1260	S7										
		β alloys		410	1400	S8										
		Tungsten alloys		300	1010	S9										
	Molybdenum alloys			300	1010	S10										
H	Hardened steel			<63 HRC	-	H1-H4										
O	Plastics, graphite					01-06										

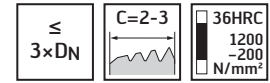
B 6

HSS-E machine thread formers

Protodyn® Eco Plus

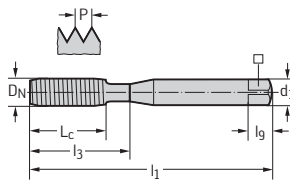


– For long-chipping materials



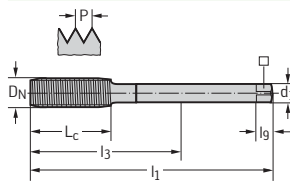
	P	M	K	N	S	H	O
TICN	••	•	•	••	•	•	•
TIN	••	•	•	••	•	•	•

DIN 2174



Designation TICN	Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
EP2061106-M2	EP2061105-M2	M 2	0,4	45	6	11	2,8	2,1	5	3
EP2061106-M2.5	EP2061105-M2.5	M 2.5	0,45	50	8	14	2,8	2,1	5	3
EP2061106-M3	EP2061105-M3	M 3	0,5	56	9	18	3,5	2,7	6	4
EP2061106-M3.5	EP2061105-M3.5	M 3.5	0,6	56	11	20	4	3	6	4
EP2061106-M4	EP2061105-M4	M 4	0,7	63	12	21	4,5	3,4	6	5
EP2061106-M5	EP2061105-M5	M 5	0,8	70	13	25	6	4,9	8	5
EP2061106-M6	EP2061105-M6	M 6	1	80	15	30	6	4,9	8	5
EP2061106-M8	EP2061105-M8	M 8	1,25	90	18	35	8	6,2	9	5
EP2061106-M10	EP2061105-M10	M 10	1,5	100	20	39	10	8	11	5

DIN 2174



Designation TICN	Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
EP2066106-M12	EP2066105-M12	M 12	1,75	110	23	83	9	7	10	5
EP2066106-M14	EP2066105-M14	M 14	2	110	25	81	11	9	12	6
EP2066106-M16	EP2066105-M16	M 16	2	110	25	68	12	9	12	6
	EP2066105-M20	M 20	2,5	140	30	95	16	12	15	7

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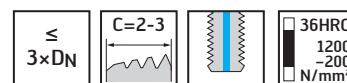
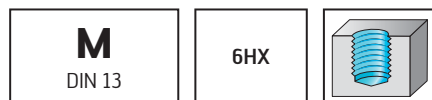


HSS-E machine thread formers

Protodyn® Eco Plus



- For long-chipping materials
- With lubrication groove



	P	M	K	N	S	H	O
TICN	●	●	●	●	●	●	●
TIN	●	●	●	●	●	●	●

DIN 2174	Designation TICN	Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	EP2061116-M5	EP2061115-M5	M 5	0,8	70	13	25	6	4,9	8	5
	EP2061116-M6	EP2061115-M6	M 6	1	80	15	30	6	4,9	8	5
	EP2061116-M8	EP2061115-M8	M 8	1,25	90	18	35	8	6,2	9	5
	EP2061116-M10	EP2061115-M10	M 10	1,5	100	20	39	10	8	11	5

DIN 2174	Designation TICN	Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	EP2066116-M12	EP2066115-M12	M 12	1,75	110	23	83	9	7	10	6
	EP2066116-M14	EP2066115-M14	M 14	2	110	25	81	11	9	12	6
	EP2066116-M16	EP2066115-M16	M 16	2	110	25	68	12	9	12	6

B6

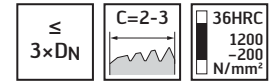
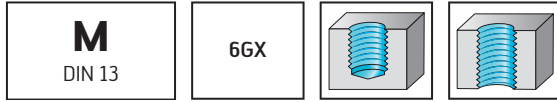


HSS-E machine thread formers

Protodyn® Eco Plus

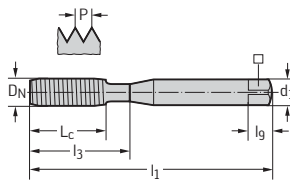


– For long-chipping materials



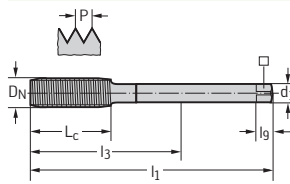
	P	M	K	N	S	H	O
TICN	••	•	•	••	•	•	•
TIN	••	•	•	••	•	•	•

DIN 2174



Designation TICN	Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
EP2063106-M2	EP2063105-M2	M 2	0,4	45	6	11	2,8	2,1	5	3
EP2063106-M2.5	EP2063105-M2.5	M 2.5	0,45	50	8	14	2,8	2,1	5	3
EP2063106-M3	EP2063105-M3	M 3	0,5	56	9	18	3,5	2,7	6	4
EP2063106-M3.5	EP2063105-M3.5	M 3.5	0,6	56	11	20	4	3	6	4
EP2063106-M4	EP2063105-M4	M 4	0,7	63	12	21	4,5	3,4	6	5
EP2063106-M5	EP2063105-M5	M 5	0,8	70	13	25	6	4,9	8	5
EP2063106-M6	EP2063105-M6	M 6	1	80	15	30	6	4,9	8	5
EP2063106-M8	EP2063105-M8	M 8	1,25	90	18	35	8	6,2	9	5
EP2063106-M10	EP2063105-M10	M 10	1,5	100	20	39	10	8	11	5

DIN 2174



Designation TICN	Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
	EP2068105-M12	M 12	1,75	110	23	83	9	7	10	5
	EP2068105-M14	M 14	2	110	25	81	11	9	12	6
	EP2068105-M16	M 16	2	110	25	68	12	9	12	6

B6

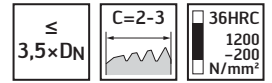


HSS-E machine thread formers

Protodyn® S Eco Plus

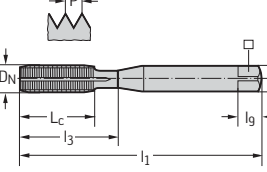


– For long-chipping materials



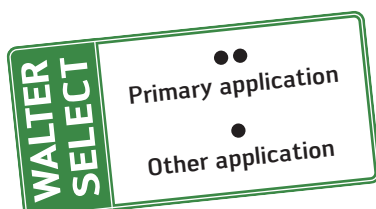
	P	M	K	N	S	H	O
TICN	●	●	●	●	●	●	●
TIN	●	●	●	●	●	●	●

DIN 2174



Designation TICN	Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	 mm	l _g mm	N
EP2061706-M2	EP2061705-M2	M 2	0,4	45	6	11	2,8	2,1	5	3
EP2061706-M2.5	EP2061705-M2.5	M 2.5	0,45	50	8	14	2,8	2,1	5	3
EP2061706-M3	EP2061705-M3	M 3	0,5	56	9	18	3,5	2,7	6	4
EP2061706-M3.5	EP2061705-M3.5	M 3.5	0,6	56	11	20	4	3	6	4
EP2061706-M4	EP2061705-M4	M 4	0,7	63	12	21	4,5	3,4	6	5
EP2061706-M5	EP2061705-M5	M 5	0,8	70	13	25	6	4,9	8	5
EP2061706-M6	EP2061705-M6	M 6	1	80	15	30	6	4,9	8	5
EP2061706-M8	EP2061705-M8	M 8	1,25	90	18	35	8	6,2	9	5
EP2061706-M10	EP2061705-M10	M 10	1,5	100	20	39	10	8	11	5

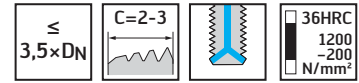
DIN 2174	Designation TICN	Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	EP2066706-M12	EP2066705-M12	M 12	1,75	110	23	83	9	7	10	5
	EP2066706-M14	EP2066705-M14	M 14	2	110	25	81	11	9	12	6
	EP2066706-M16	EP2066705-M16	M 16	2	110	25	68	12	9	12	6
	EP2066706-M20	EP2066705-M20	M 20	2,5	140	30	95	16	12	15	7



HSS-E machine thread formers Protodyn® S Eco Plus



– For long-chipping materials



	P	M	K	N	S	H	O
TICN	•	•	•	•	•	•	•
TIN	•	•	•	•	•	•	•

DIN 2174	Designation TICN	Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	EP2061746-M5	EP2061745-M5	M 5	0,8	70	13	25	6	4,9	8	5
	EP2061746-M6	EP2061745-M6	M 6	1	80	15	30	6	4,9	8	5
	EP2061746-M8	EP2061745-M8	M 8	1,25	90	18	35	8	6,2	9	5
	EP2061746-M10	EP2061745-M10	M 10	1,5	100	20	39	10	8	11	5

DIN 2174	Designation TICN	Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	EP2066746-M12	EP2066745-M12	M 12	1,75	110	23	83	9	7	10	5
	EP2066746-M14	EP2066745-M14	M 14	2	110	25	81	11	9	12	6
	EP2066746-M16	EP2066745-M16	M 16	2	110	25	68	12	9	12	6
	EP2066746-M20	EP2066745-M20	M 20	2,5	140	30	95	16	12	15	7

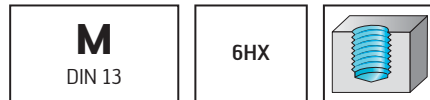
B6

HSS-E machine thread formers

Protodyn® S Eco Plus



– For long-chipping materials



	P	M	K	N	S	H	O
TICN	●	●	●	●	●	●	●
TIN	●	●	●	●	●	●	●

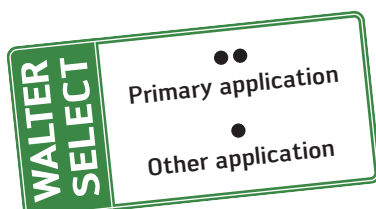
DIN 2174

Technical drawing of a thread forming tool (DIN 2174) showing dimensions: P (pitch), DN (nominal diameter), Lc (cutting length), l3 (thread length), l1 (total length), lg (thread length), d1 (thread diameter), and a square symbol indicating a square thread profile.

Designation TICN	Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	 mm	l _g mm	N
EP2061806-M2	EP2061805-M2	M 2	0,4	45	6	11	2,8	2,1	5	3
EP2061806-M2.5	EP2061805-M2.5	M 2.5	0,45	50	8	14	2,8	2,1	5	3
EP2061806-M3	EP2061805-M3	M 3	0,5	56	9	18	3,5	2,7	6	4
EP2061806-M3.5	EP2061805-M3.5	M 3.5	0,6	56	11	20	4	3	6	4
EP2061806-M4	EP2061805-M4	M 4	0,7	63	12	21	4,5	3,4	6	5
EP2061806-M5	EP2061805-M5	M 5	0,8	70	13	25	6	4,9	8	5
EP2061806-M6	EP2061805-M6	M 6	1	80	15	30	6	4,9	8	5
EP2061806-M8	EP2061805-M8	M 8	1,25	90	18	35	8	6,2	9	5
EP2061806-M10	EP2061805-M10	M 10	1,5	100	20	39	10	8	11	5

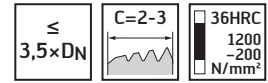
DIN 2174	Designation TICN	Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	EP2066806-M12	EP2066805-M12	M 12	1,75	110	23	83	9	7	10	5
	EP2066806-M14	EP2066805-M14	M 14	2	110	25	81	11	9	12	6
	EP2066806-M16	EP2066805-M16	M 16	2	110	25	68	12	9	12	6

B 6



HSS-E machine thread formers

Protodyn® S Eco Plus

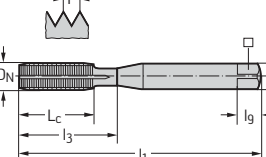


– For long-chipping materials



	P	M	K	N	S	H	O
TICN	••	••	••	••	••	••	••
TIN	••	••	••	••	••	••	••

DIN 2174



Designation TICN	Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	 mm	l _g mm	N
EP2063706-M2	EP2063705-M2	M 2	0,4	45	6	11	2,8	2,1	5	3
EP2063706-M2.5	EP2063705-M2.5	M 2.5	0,45	50	8	14	2,8	2,1	5	3
EP2063706-M3	EP2063705-M3	M 3	0,5	56	9	18	3,5	2,7	6	4
EP2063706-M3.5	EP2063705-M3.5	M 3.5	0,6	56	11	20	4	3	6	4
EP2063706-M4	EP2063705-M4	M 4	0,7	63	12	21	4,5	3,4	6	5
EP2063706-M5	EP2063705-M5	M 5	0,8	70	13	25	6	4,9	8	5
EP2063706-M6	EP2063705-M6	M 6	1	80	15	30	6	4,9	8	5
EP2063706-M8	EP2063705-M8	M 8	1,25	90	18	35	8	6,2	9	5
EP2063706-M10	EP2063705-M10	M 10	1,5	100	20	39	10	8	11	5

DIN 2174	Designation TICN	Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
		EP2068705-M12	M 12	1,75	110	23	83	9	7	10	5
		EP2068705-M14	M 14	2	110	25	81	11	9	12	6
		EP2068705-M16	M 16	2	110	25	68	12	9	12	6

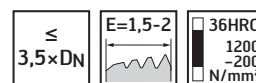
B6

HSS-E machine thread formers

Protodyn® S Eco Plus

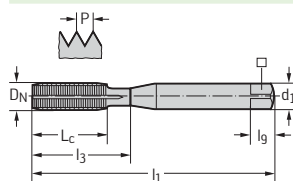


– For long-chipping materials



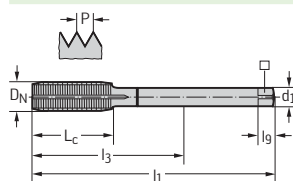
	P	M	K	N	S	H	O
TICN	●	●	●	●	●	●	●
TIN	●	●	●	●	●	●	●

DIN 2174

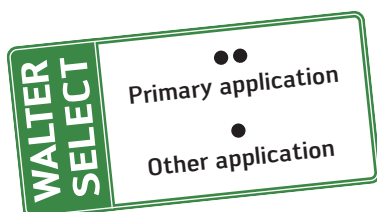


Designation TICN	Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
EP2063806-M2	EP2063805-M2	M 2	0,4	45	6	11	2,8	2,1	5	3
EP2063806-M2.5	EP2063805-M2.5	M 2.5	0,45	50	8	14	2,8	2,1	5	3
EP2063806-M3	EP2063805-M3	M 3	0,5	56	9	18	3,5	2,7	6	4
EP2063806-M4	EP2063805-M4	M 4	0,7	63	12	21	4,5	3,4	6	5
EP2063806-M5	EP2063805-M5	M 5	0,8	70	13	25	6	4,9	8	5
EP2063806-M6	EP2063805-M6	M 6	1	80	15	30	6	4,9	8	5
EP2063806-M8	EP2063805-M8	M 8	1,25	90	18	35	8	6,2	9	5
EP2063806-M10	EP2063805-M10	M 10	1,5	100	20	39	10	8	11	5

DIN 2174



Designation TICN	Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
	EP2068805-M12	M 12	1,75	110	23	83	9	7	10	5
	EP2068805-M14	M 14	2	110	25	81	11	9	12	6
	EP2068805-M16	M 16	2	110	25	68	12	9	12	6

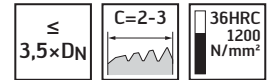


HSS-E machine thread formers

Protodyn® S Synchrospeed



- For long-chipping materials
- Only for synchronous machining (rigid tapping)



	P	M	K	N	S	H	O
TICN	••	••	••	••	••	••	••
TIN	••	••	••	••	••	••	••

~DIN 2174	Designation TICN	Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	□ mm	l _g mm	N
	S2061306-M3	S2061305-M3	M 3	0,5	70	3	18	6	4,9	8	3
	S2061306-M4	S2061305-M4	M 4	0,7	70	4	21	6	4,9	8	3
	S2061306-M5	S2061305-M5	M 5	0,8	70	5	25	6	4,9	8	4
	S2061306-M6	S2061305-M6	M 6	1	80	6	30	6	4,9	8	4
	S2061306-M8	S2061305-M8	M 8	1,25	90	8	35	8	6,2	9	5
	S2061306-M10	S2061305-M10	M 10	1,5	100	9	39	10	8	11	5

~DIN 2174	Designation TICN	Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	□ mm	l _g mm	N
	S2066306-M12	S2066305-M12	M 12	1,75	110	11	42	12	9	12	5

B6

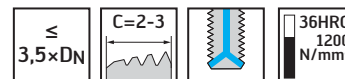


HSS-E machine thread formers

Protodyn® S Synchrospeed



- For long-chipping materials
- Only for synchronous machining (rigid tapping)



	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●

~DIN 2174										
	Designation	D_N	P	l_1	l_c	l_3	d_1	h_6	l_g	N
	TIN		mm	mm	mm	mm	mm	mm	mm	
	S2061345-M4	M 4	0,7	70	4	21	6	4,9	8	3
	S2061345-M5	M 5	0,8	70	5	25	6	4,9	8	4
	S2061345-M6	M 6	1	80	6	30	6	4,9	8	4
	S2061345-M8	M 8	1,25	90	8	35	8	6,2	9	5
	S2061345-M10	M 10	1,5	100	9	39	10	8	11	5

~DIN 2174										
	Designation	D_N	P	l_1	l_c	l_3	d_1	h_6	l_g	N
	TIN		mm	mm	mm	mm	mm	mm	mm	
	S2066345-M12	M 12	1,75	110	11	42	12	9	12	5

B6

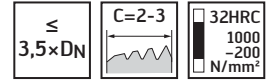


HSS-E machine thread formers

Protodyn® S Eco Inox



- For long-chipping materials
- For stainless steels when using emulsion



	P	M	K	N	S	H	O
TIN	●	●●	●	●	●	●	●

DIN 2174	Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
	E2061305-M2	M 2	0,4	45	6	6	2,8	2,1	5	3
	E2061305-M2.5	M 2.5	0,45	50	8	8	2,8	2,1	5	3
	E2061305-M3	M 3	0,5	56	9	18	3,5	2,7	6	3
	E2061305-M4	M 4	0,7	63	12	21	4,5	3,4	6	3
	E2061305-M5	M 5	0,8	70	13	25	6	4,9	8	4
	E2061305-M6	M 6	1	80	15	30	6	4,9	8	4
	E2061305-M8	M 8	1,25	90	18	35	8	6,2	9	5
	E2061305-M10	M 10	1,5	100	20	39	10	8	11	5

≤ M 2.5: Without reduced neck after the thread

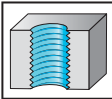
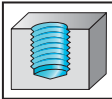
DIN 2174	Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
	E2066305-M12	M 12	1,75	110	23	83	9	7	10	5

B6

HSS-E machine thread formers
Protodyn® Eco LM

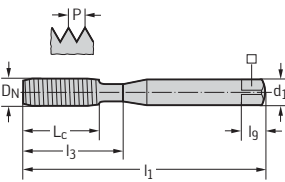


– For long-chipping materials



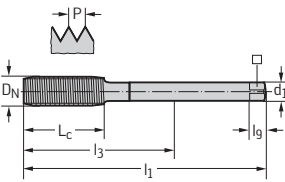
	P	M	K	N	S	H	O
CRN	●	●	●	●	●	●	●

DIN 2174

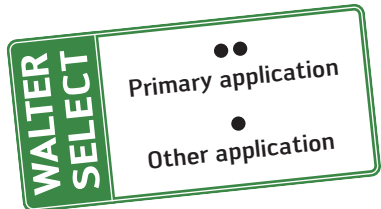


Designation CRN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
E2061604-M2	M 2	0,4	45	6	11	2,8	2,1	5	3
E2061604-M2.5	M 2.5	0,45	50	8	14	2,8	2,1	5	3
E2061604-M3	M 3	0,5	56	9	18	3,5	2,7	6	3
E2061604-M4	M 4	0,7	63	12	21	4,5	3,4	6	3
E2061604-M5	M 5	0,8	70	13	25	6	4,9	8	4
E2061604-M6	M 6	1	80	15	30	6	4,9	8	4
E2061604-M8	M 8	1,25	90	18	35	8	6,2	9	4
E2061604-M10	M 10	1,5	100	20	39	10	8	11	4

DIN 2174



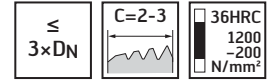
Designation CRN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
E2066604-M12	M 12	1,75	110	23	83	9	7	10	4



HSS-E machine thread formers Protodyn® Plus

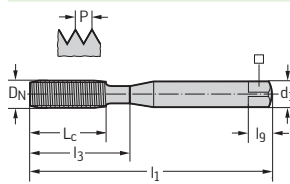


– For long-chipping materials



	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●

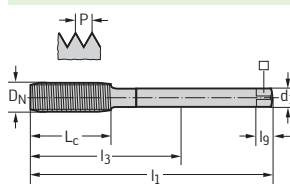
DIN 2174



Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
DP2061105-M1	M 1	0,25	40	6	6	2,5	2,1	5	3
DP2061105-M1.1	M 1.1	0,25	40	6	6	2,5	2,1	5	3
DP2061105-M1.2	M 1.2	0,25	40	6	6	2,5	2,1	5	3
DP2061105-M1.4	M 1.4	0,3	40	7	7	2,5	2,1	5	3
DP2061105-M1.6	M 1.6	0,35	40	8	8	2,5	2,1	5	3
DP2061105-M1.7	M 1.7	0,35	40	8	8	2,5	2,1	5	3
DP2061105-M1.8	M 1.8	0,35	40	8	8	2,5	2,1	5	3
DP2061105-M2	M 2	0,4	45	6	11	2,8	2,1	5	3
DP2061105-M2.2	M 2.2	0,45	45	7	12	2,8	2,1	5	3
DP2061105-M2.3	M 2.3	0,4	45	7	12	2,8	2,1	5	3
DP2061105-M2.5	M 2.5	0,45	50	8	14	2,8	2,1	5	3
DP2061105-M2.6	M 2.6	0,45	50	8	14	2,8	2,1	5	3
DP2061105-M3	M 3	0,5	56	9	18	3,5	2,7	6	4
DP2061105-M3.5	M 3.5	0,6	56	11	20	4	3	6	4
DP2061105-M4	M 4	0,7	63	12	21	4,5	3,4	6	5
DP2061105-M5	M 5	0,8	70	13	25	6	4,9	8	5
DP2061105-M6	M 6	1	80	15	30	6	4,9	8	5
DP2061105-M7	M 7	1	80	15	30	7	5,5	8	5
DP2061105-M8	M 8	1,25	90	18	35	8	6,2	9	5
DP2061105-M10	M 10	1,5	100	20	39	10	8	11	5

≤ M 1.4: 5HX

DIN 2174



Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
DP2066105-M12	M 12	1,75	110	23	83	9	7	10	5
DP2066105-M14	M 14	2	110	25	81	11	9	12	6
DP2066105-M16	M 16	2	110	25	68	12	9	12	6
DP2066105-M18	M 18	2,5	125	30	81	14	11	14	7
DP2066105-M20	M 20	2,5	140	30	95	16	12	15	7
DP2066105-M24	M 24	3	160	36	113	18	14,5	17	8

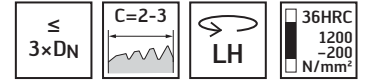


HSS-E machine thread formers

Protodyn® Plus

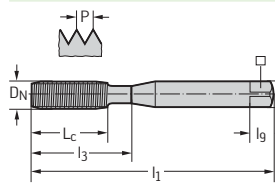


– For long-chipping materials



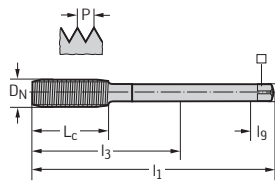
	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●

DIN 2174

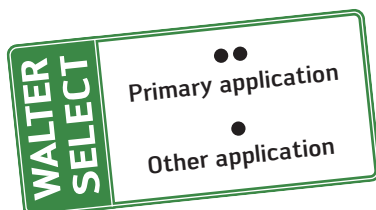


Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
DP2061185-M3	M 3 - LH	0,5	56	9	18	3,5	2,7	6	4
DP2061185-M4	M 4 - LH	0,7	63	12	21	4,5	3,4	6	5
DP2061185-M5	M 5 - LH	0,8	70	13	25	6	4,9	8	5
DP2061185-M6	M 6 - LH	1	80	15	30	6	4,9	8	5
DP2061185-M8	M 8 - LH	1,25	90	18	35	8	6,2	9	5
DP2061185-M10	M 10 - LH	1,5	100	20	39	10	8	11	5

DIN 2174



Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
DP2066185-M12	M 12 - LH	1,75	110	23	83	9	7	10	5
DP2066185-M16	M 16 - LH	2	110	25	68	12	9	12	6

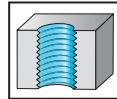
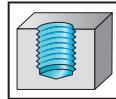


HSS-E machine thread formers

Protodyn® Plus

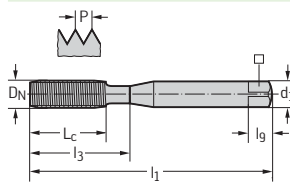


– For long-chipping materials



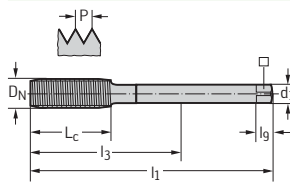
	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●

DIN 2174



Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
DP2063105-M2	M 2	0,4	45	6	11	2,8	2,1	5	3
DP2063105-M2.5	M 2.5	0,45	50	8	14	2,8	2,1	5	3
DP2063105-M3	M 3	0,5	56	9	18	3,5	2,7	6	4
DP2063105-M3.5	M 3.5	0,6	56	11	20	4	3	6	4
DP2063105-M4	M 4	0,7	63	12	21	4,5	3,4	6	5
DP2063105-M5	M 5	0,8	70	13	25	6	4,9	8	5
DP2063105-M6	M 6	1	80	15	30	6	4,9	8	5
DP2063105-M8	M 8	1,25	90	18	35	8	6,2	9	5
DP2063105-M10	M 10	1,5	100	20	39	10	8	11	5

DIN 2174



Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
DP2068105-M12	M 12	1,75	110	23	83	9	7	10	5

B6

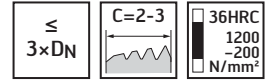


HSS-E machine thread formers

Protodyn® Plus

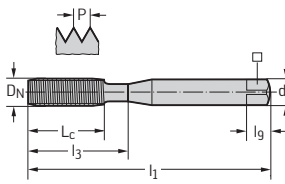


– For long-chipping materials

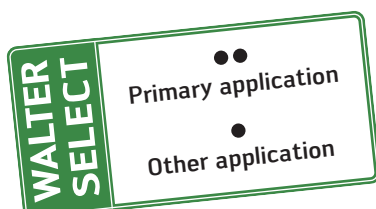


	P	M	K	N	S	H	O
TIN	●●	●	●	●●	●	●	●

DIN 2174



Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
DP2064105-M2	M 2	0,4	45	6	11	2,8	2,1	5	3
DP2064105-M2.5	M 2.5	0,45	50	8	14	2,8	2,1	5	3
DP2064105-M3	M 3	0,5	56	9	18	3,5	2,7	6	4
DP2064105-M4	M 4	0,7	63	12	21	4,5	3,4	6	5
DP2064105-M5	M 5	0,8	70	13	25	6	4,9	8	5
DP2064105-M6	M 6	1	80	15	30	6	4,9	8	5
DP2064105-M8	M 8	1,25	90	18	35	8	6,2	9	5
DP2064105-M10	M 10	1,5	100	20	39	10	8	11	5

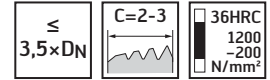


HSS-E machine thread formers

Protodyn® S Plus

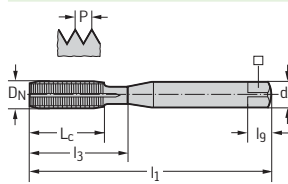


– For long-chipping materials



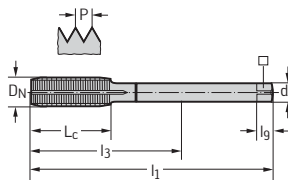
	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●

DIN 2174



Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
DP2061705-M2	M 2	0,4	45	6	11	2,8	2,1	5	3
DP2061705-M2.5	M 2.5	0,45	50	8	14	2,8	2,1	5	3
DP2061705-M3	M 3	0,5	56	9	18	3,5	2,7	6	4
DP2061705-M3.5	M 3.5	0,6	56	11	20	4	3	6	4
DP2061705-M4	M 4	0,7	63	12	21	4,5	3,4	6	5
DP2061705-M5	M 5	0,8	70	13	25	6	4,9	8	5
DP2061705-M6	M 6	1	80	15	30	6	4,9	8	5
DP2061705-M7	M 7	1	80	15	30	7	5,5	8	5
DP2061705-M8	M 8	1,25	90	18	35	8	6,2	9	5
DP2061705-M10	M 10	1,5	100	20	39	10	8	11	5

DIN 2174



Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
DP2066705-M12	M 12	1,75	110	23	83	9	7	10	5
DP2066705-M14	M 14	2	110	25	81	11	9	12	6
DP2066705-M16	M 16	2	110	25	68	12	9	12	6
DP2066705-M18	M 18	2,5	125	30	81	14	11	14	7
DP2066705-M20	M 20	2,5	140	30	95	16	12	15	7
DP2066705-M24	M 24	3	160	36	113	18	14,5	17	8

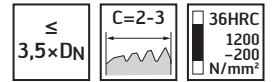
B6

HSS-E machine thread formers

Protodyn® S Plus

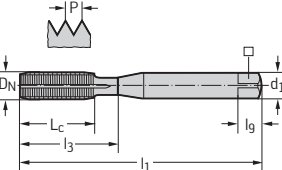


– For long-chipping materials

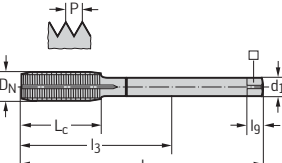


	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●

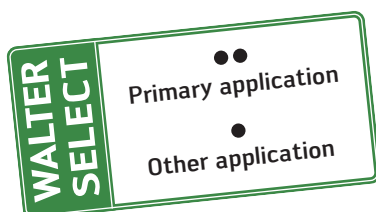
DIN 2174



Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	 mm	l _g mm	N
DP2063705-M2	M 2	0,4	45	6	11	2,8	2,1	5	3
DP2063705-M2.5	M 2.5	0,45	50	8	14	2,8	2,1	5	3
DP2063705-M3	M 3	0,5	56	9	18	3,5	2,7	6	4
DP2063705-M3.5	M 3.5	0,6	56	11	20	4	3	6	4
DP2063705-M4	M 4	0,7	63	12	21	4,5	3,4	6	5
DP2063705-M5	M 5	0,8	70	13	25	6	4,9	8	5
DP2063705-M6	M 6	1	80	15	30	6	4,9	8	5
DP2063705-M8	M 8	1,25	90	18	35	8	6,2	9	5
DP2063705-M10	M 10	1,5	100	20	39	10	8	11	5

DIN 2174										
	Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	 mm	l _g mm	N
	DP2068705-M12	M 12	1,75	110	23	83	9	7	10	5

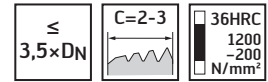
B6



HSS-E machine thread formers Protodyn® S Plus

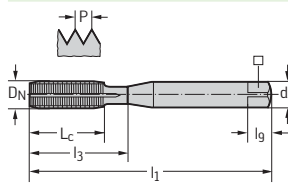


– For long-chipping materials



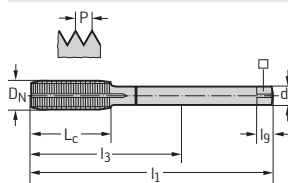
	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●

DIN 2174



Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
DP2064705-M2	M 2	0,4	45	6	11	2,8	2,1	5	3
DP2064705-M2.5	M 2.5	0,45	50	8	14	2,8	2,1	5	3
DP2064705-M3	M 3	0,5	56	9	18	3,5	2,7	6	4
DP2064705-M4	M 4	0,7	63	12	21	4,5	3,4	6	5
DP2064705-M5	M 5	0,8	70	13	25	6	4,9	8	5
DP2064705-M6	M 6	1	80	15	30	6	4,9	8	5
DP2064705-M8	M 8	1,25	90	18	35	8	6,2	9	5
DP2064705-M10	M 10	1,5	100	20	39	10	8	11	5

DIN 2174



Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
DP2069705-M12	M 12	1,75	110	23	83	9	7	10	5

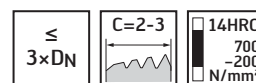
B6

HSS-E machine thread formers

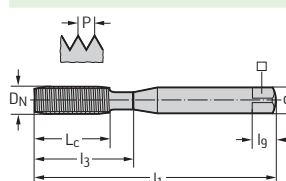
Protodyn® C



– For long-chipping materials

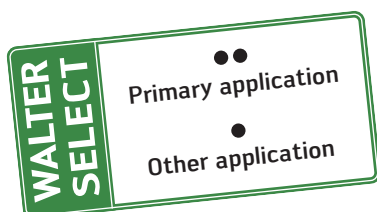


	P	M	K	N	S	H	O
NID	●						
Uncoated	●						

DIN 2174	Designation NID	Designation Uncoated	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l _g mm	N
	D70611-M1	D7061100-M1	M 1	0,25	40	6	6	2,5	2,1	5	3
	D70611-M1.2	D7061100-M1.2	M 1.2	0,25	40	6	6	2,5	2,1	5	3
	D70611-M1.4	D7061100-M1.4	M 1.4	0,3	40	7	7	2,5	2,1	5	3
	D70611-M1.6	D7061100-M1.6	M 1.6	0,35	40	8	8	2,5	2,1	5	3
	D70611-M2	D7061100-M2	M 2	0,4	45	6	11	2,8	2,1	5	3
	D70611-M2.5	D7061100-M2.5	M 2.5	0,45	50	8	13	2,8	2,1	5	3
	D70611-M3	D7061100-M3	M 3	0,5	56	9	18	3,5	2,7	6	4
	D70611-M3.5	D7061100-M3.5	M 3.5	0,6	56	11	20	4	3	6	4
	D70611-M4	D7061100-M4	M 4	0,7	63	12	21	4,5	3,4	6	5
	D70611-M5	D7061100-M5	M 5	0,8	70	13	25	6	4,9	8	5
	D70611-M6	D7061100-M6	M 6	1	80	15	30	6	4,9	8	5
	D70611-M8	D7061100-M8	M 8	1,25	90	18	35	8	6,2	9	5
	D70611-M10	D7061100-M10	M 10	1,5	100	20	39	10	8	11	5

≤ M 1.4: 5HX

B6



HSS-E machine thread formers

Protodyn® C



– For long-chipping materials

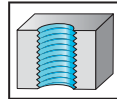
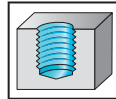
≤
3×D_N

C=2-3

32HRC
1000
–200
N/mm²

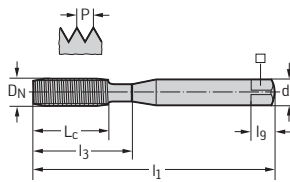
M
DIN 13

6GX



	P	M	K	N	S	H	O
Uncoated	●						

DIN 2174											
Designation Uncoated		D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N	
D7063100-M2		M 2	0,4	45	6	11	2,8	2,1	5	3	
D7063100-M3		M 3	0,5	56	9	18	3,5	2,7	6	4	
D7063100-M4		M 4	0,7	63	12	21	4,5	3,4	6	5	
D7063100-M5		M 5	0,8	70	13	25	6	4,9	8	5	
D7063100-M6		M 6	1	80	15	30	6	4,9	8	5	
D7063100-M8		M 8	1,25	90	18	35	8	6,2	9	5	
D7063100-M10		M 10	1,5	100	20	39	10	8	11	5	

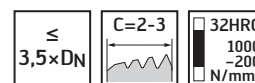


HSS-E machine thread formers

Protodyn® SC

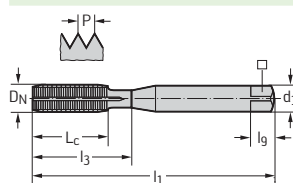


– For long-chipping materials



	P	M	K	N	S	H	O
NID	●	●	●	●	●	●	●
Uncoated	●	●	●	●	●	●	●

DIN 2174



Designation NID	Designation Uncoated	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
D70617-M3	D7061700-M3	M 3	0,5	56	9	18	3,5	2,7	6	4
D70617-M3.5	D7061700-M3.5	M 3.5	0,6	56	11	20	4	3	6	4
D70617-M4	D7061700-M4	M 4	0,7	63	12	21	4,5	3,4	6	5
D70617-M5	D7061700-M5	M 5	0,8	70	13	25	6	4,9	8	5
D70617-M6	D7061700-M6	M 6	1	80	15	30	6	4,9	8	5
	D7061700-M7	M 7	1	80	15	30	7	5,5	8	5
D70617-M8	D7061700-M8	M 8	1,25	90	18	35	8	6,2	9	5
D70617-M10	D7061700-M10	M 10	1,5	100	20	39	10	8	11	5

B6

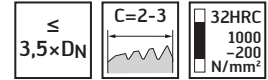


HSS-E machine thread formers

Protodyn® SC



– For long-chipping materials



	P	M	K	N	S	H	O
Uncoated	●			●			

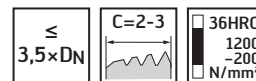
DIN 2174										
	Designation	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
	Uncoated									
	D7063700-M3	M 3	0,5	56	9	18	3,5	2,7	6	4
	D7063700-M4	M 4	0,7	63	12	21	4,5	3,4	6	5
	D7063700-M5	M 5	0,8	70	13	25	6	4,9	8	5
	D7063700-M6	M 6	1	80	15	30	6	4,9	8	5
	D7063700-M8	M 8	1,25	90	18	35	8	6,2	9	5
	D7063700-M10	M 10	1,5	100	20	39	10	8	11	5

HSS-E machine thread formers

Protodyn® SF



– For long-chipping materials

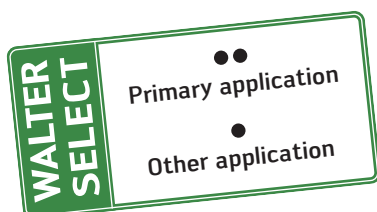


	P	M	K	N	S	H	O
TICN	●●	●●	●●	●●	●	●	●

DIN 2174	Designation TICN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	D7061706-M3	M 3	0,5	56	9	18	3,5	2,7	6	4
	D7061706-M4	M 4	0,7	63	12	21	4,5	3,4	6	5
	D7061706-M5	M 5	0,8	70	13	25	6	4,9	8	5
	D7061706-M6	M 6	1	80	15	30	6	4,9	8	5
	D7061706-M8	M 8	1,25	90	18	35	8	6,2	9	5
	D7061706-M10	M 10	1,5	100	20	39	10	8	11	5

DIN 2174	Designation TICN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N
	D7066706-M12	M 12	1,75	110	23	83	9	7	10	5
	D7066706-M14	M 14	2	110	25	81	11	9	12	6
	D7066706-M16	M 16	2	110	25	68	12	9	12	6

B6

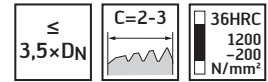


Solid carbide machine thread formers

Protodyn® HSC



– For long-chipping materials



	P	M	K	N	S	H	O
TICN	●	●	●	●	●	●	●

~DIN 2174											
	Designation TICN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	□ mm	l ₉ mm	N	
	HP8061106-M3	M 3	0,5	56	10	10	3,5	2,7	6	4	
	HP8061106-M4	M 4	0,7	63	13	13	4,5	3,4	6	5	
	HP8061106-M5	M 5	0,8	70	16	16	6	4,9	8	5	
	HP8061106-M6	M 6	1	80	15	30	6	4,9	8	5	
	HP8061106-M8	M 8	1,25	90	18	35	8	6,2	9	5	
	HP8061106-M10	M 10	1,5	100	20	39	10	8	11	5	

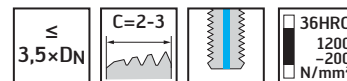
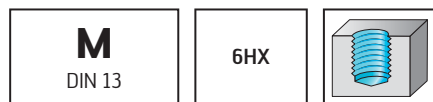
≤ M 5: Without reduced neck after the thread

Solid carbide machine thread formers

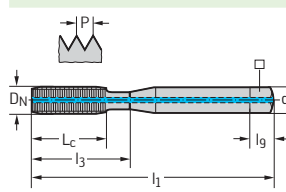
Protodyn® S HSC



– For long-chipping materials



	P	M	K	N	S	H	O
TICN	●●	●	●●	●●	●	●	●

DIN 2174										
	Designation TICN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	mm	l _g mm	N
	HP8061716-M6	M 6	1	80	15	30	6	4,9	8	5
	HP8061716-M8	M 8	1,25	90	18	35	8	6,2	9	5
	HP8061716-M10	M 10	1,5	100	20	39	10	8	11	5

B6

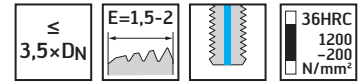


Solid carbide machine thread formers

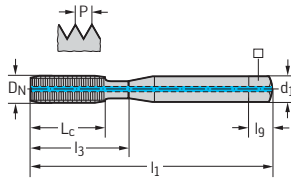
Protodyn® S HSC



– For long-chipping materials



	P	M	K	N	S	H	O
TICN	●	●	●	●	●	●	●

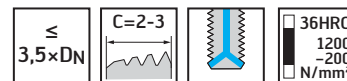
DIN 2174										
	Designation	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	mm	l ₉ mm	N
	TICN									
	HP8061816-M6	M 6	1	80	15	30	6	4,9	8	5
	HP8061816-M8	M 8	1,25	90	18	35	8	6,2	9	5
	HP8061816-M10	M 10	1,5	100	20	39	10	8	11	5

Solid carbide machine thread formers

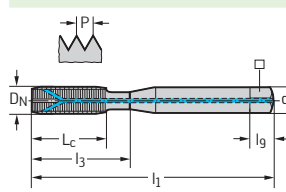
Protodyn® S HSC



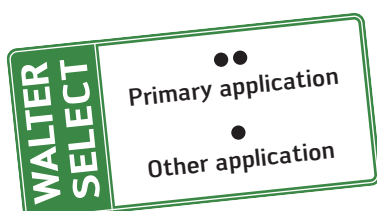
– For long-chipping materials



	P	M	K	N	S	H	O
TICN	●	●	●	●	●	●	●

DIN 2174										
	Designation TICN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	mm	l _g mm	N
	HP8061746-M6	M 6	1	80	15	30	6	4,9	8	5
	HP8061746-M8	M 8	1,25	90	18	35	8	6,2	9	5
	HP8061746-M10	M 10	1,5	100	20	39	10	8	11	5

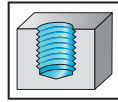
B6



HSS-E machine thread formers Protodyn® Eco Plus



- For long-chipping materials
- With lubrication groove



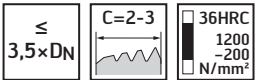
	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●

DIN 2174										
	Designation		P	l ₁	L _c	l ₃	d ₁		l ₉	N
	TIN	D _N	mm	mm	mm	mm	h9 mm	mm	mm	
	EP2166115-M8X1	MF 8x1	1	90	18	67	6	4,9	8	5
	EP2166115-M10X1	MF 10x1	1	90	20	67	7	5,5	8	5
	EP2166115-M12X1	MF 12x1	1	100	21	73	9	7	10	6
	EP2166115-M12X1.5	MF 12x1.5	1,5	100	21	73	9	7	10	6
	EP2166115-M14X1.5	MF 14x1.5	1,5	100	21	71	11	9	12	6

HSS-E machine thread formers
Protodyn® S Eco Plus



– For long-chipping materials

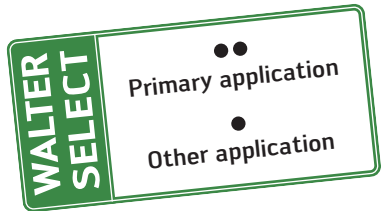


	P	M	K	N	S	H	O
TICN	●●	●●	●●	●●	●●	●●	●●
TIN	●●	●●	●●	●●	●●	●●	●●

DIN 2174

Technical drawing of a thread former. The drawing shows a side view of the tool with various dimensions labeled. At the top left, a detail of the thread profile is shown with pitch 'P'. The main body of the tool has a diameter 'DN' at the front. The length of the cutting edge is 'Lc'. The length of the body is 'l3'. The total length is 'l1'. The diameter of the body is 'dg'. The length of the handle is 'lg'.

Designation TICN	Designation TIN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	 mm	l _g mm	N
EP2166706-M8X1	EP2166705-M8X1	MF 8x1	1	90	18	67	6	4,9	8	5
EP2166706-M10X1	EP2166705-M10X1	MF 10x1	1	90	20	67	7	5,5	8	5
EP2166706-M12X1	EP2166705-M12X1	MF 12x1	1	100	21	73	9	7	10	5
EP2166706-M12X1.5	EP2166705-M12X1.5	MF 12x1.5	1.5	100	21	73	9	7	10	5
EP2166706-M14X1.5	EP2166705-M14X1.5	MF 14x1.5	1.5	100	21	71	11	9	12	6
EP2166706-M16X1.5	EP2166705-M16X1.5	MF 16x1.5	1.5	100	21	58	12	9	12	6

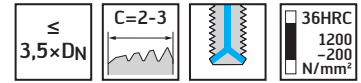


HSS-E machine thread formers

Protodyn® S Eco Plus



– For long-chipping materials



	P	M	K	N	S	H	O
TICN	●	●	●	●	●	●	●
TIN	●	●	●	●	●	●	●

DIN 2174											
		Designation TICN	Designation TIN	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	l_g mm	N
	EP2166746-M8X1	EP2166745-M8X1	MF 8x1	1	90	18	67	6	4,9	8	5
	EP2166746-M10X1	EP2166745-M10X1	MF 10x1	1	90	20	67	7	5,5	8	5
	EP2166746-M12X1	EP2166745-M12X1	MF 12x1	1	100	21	73	9	7	10	5
	EP2166746-M12X1.5	EP2166745-M12X1.5	MF 12x1.5	1,5	100	21	73	9	7	10	5
	EP2166746-M14X1.5	EP2166745-M14X1.5	MF 14x1.5	1,5	100	21	71	11	9	12	6
	EP2166746-M16X1.5	EP2166745-M16X1.5	MF 16x1.5	1,5	100	21	58	12	9	12	6

HSS-E machine thread formers
Protodyn® S Eco Plus



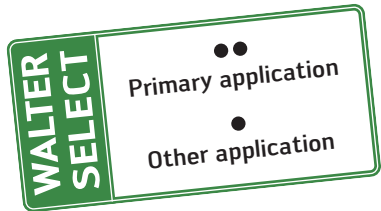
– For long-chipping materials

$\leq 3,5 \times D_N$	C=2-3	36HRC 1200 -200 N/mm ²
-----------------------	-------	--



	P	M	K	N	S	H	O
TICN	●	●	●	●	●	●	●
TIN	●	●	●	●	●	●	●

DIN 2174												
	Designation TICN	Designation TIN	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h9 mm	 mm	l_g mm	N	
	EP2168706-M8X1	EP2168705-M8X1	MF 8x1	1	90	18	67	6	4,9	8	5	
	EP2168706-M10X1	EP2168705-M10X1	MF 10x1	1	90	20	67	7	5,5	8	5	
	EP2168706-M12X1	EP2168705-M12X1	MF 12x1	1	100	21	73	9	7	10	5	
	EP2168706-M12X1.5	EP2168705-M12X1.5	MF 12x1.5	1.5	100	21	73	9	7	10	5	
	EP2168706-M14X1.5	EP2168705-M14X1.5	MF 14x1.5	1.5	100	21	71	11	9	12	6	
	EP2168706-M16X1.5	EP2168705-M16X1.5	MF 16x1.5	1.5	100	21	58	12	9	12	6	

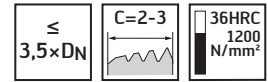


HSS-E machine thread formers

Protodyn® S Synchrospeed



- For long-chipping materials
- Only for synchronous machining (rigid tapping)



	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●

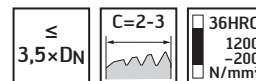
~DIN 2174											
	Designation	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	□ mm	l ₉ mm	N	
	TIN										
	S2166305-M8X1	MF 8x1	1	90	6	35	8	6,2	9	5	
	S2166305-M10X1	MF 10x1	1	90	6	39	10	8	11	5	
	S2166305-M16X1.5	MF 16x1.5	1,5	100	9	50	16	12	15	6	

HSS-E machine thread formers

Protodyn® S Plus

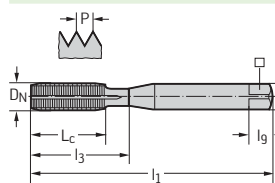


– For long-chipping materials



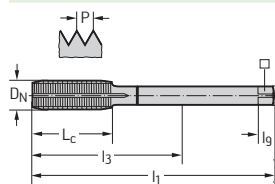
	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●

DIN 2174



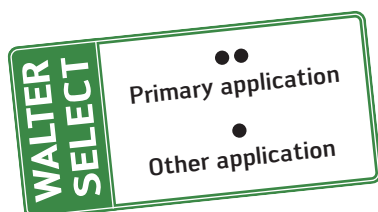
Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
DP2161705-M4X0.5	MF 4x0.5	0,5	63	12	21	4,5	3,4	6	5
DP2161705-M5X0.5	MF 5x0.5	0,5	70	13	25	6	4,9	8	5
DP2161705-M6X0.5	MF 6x0.5	0,5	80	15	30	6	4,9	8	5
DP2161705-M6X0.75	MF 6x0.75	0,75	80	15	30	6	4,9	8	5
DP2161705-M7X0.75	MF 7x0.75	0,75	80	15	30	7	5,5	8	5

DIN 2174



Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
DP2166705-M8X0.5	MF 8x0.5	0,5	80	15	57	6	4,9	8	5
DP2166705-M8X0.75	MF 8x0.75	0,75	80	15	57	6	4,9	8	5
DP2166705-M8X1	MF 8x1	1	90	18	67	6	4,9	8	5
DP2166705-M10X1	MF 10x1	1	90	20	67	7	5,5	8	5
DP2166705-M10X1.25	MF 10x1.25	1,25	100	20	77	7	5,5	8	5
DP2166705-M12X1	MF 12x1	1	100	21	73	9	7	10	5
DP2166705-M12X1.25	MF 12x1.25	1,25	100	21	73	9	7	10	5
DP2166705-M12X1.5	MF 12x1.5	1,5	100	21	73	9	7	10	5
DP2166705-M14X1.5	MF 14x1.5	1,5	100	21	71	11	9	12	6
DP2166705-M16X1.5	MF 16x1.5	1,5	100	21	58	12	9	12	6
DP2166705-M18X1.5	MF 18x1.5	1,5	110	24	66	14	11	14	7
DP2166705-M20X1.5	MF 20x1.5	1,5	125	24	80	16	12	15	7
DP2166705-M20X2	MF 20x2	2	140	30	95	16	12	15	7
DP2166705-M22X1.5	MF 22x1.5	1,5	125	24	78	18	14,5	17	7
DP2166705-M24X1.5	MF 24x1.5	1,5	140	26	93	18	14,5	17	8
DP2166705-M24X2	MF 24x2	2	140	26	93	18	14,5	17	8
DP2166705-M27X1.5	MF 27x1.5	1,5	140	26	77	20	16	19	8
DP2166705-M27X2	MF 27x2	2	140	26	77	20	16	19	8
DP2166705-M30X1.5	MF 30x1.5	1,5	150	26	85	22	18	21	10
DP2166705-M30X2	MF 30x2	2	150	26	85	22	18	21	10

B 6

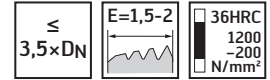


HSS-E machine thread formers

Protodyn® S Plus

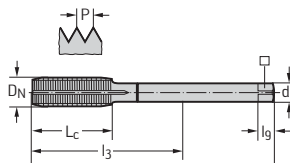


– For long-chipping materials



	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●

DIN 2174



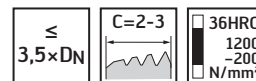
Designation TIN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N
DP2168805-M10X1	MF 10x1	1	90	20	67	7	5,5	8	6
DP2168805-M12X1.5	MF 12x1.5	1,5	100	21	73	9	7	10	6
DP2168805-M14X1.5	MF 14x1.5	1,5	100	21	71	11	9	12	7
DP2168805-M16X1.5	MF 16x1.5	1,5	100	21	58	12	9	12	7

HSS-E machine thread formers

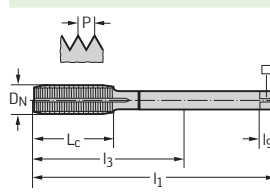
Protodyn® SF



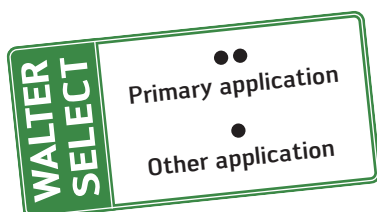
– For long-chipping materials



	P	M	K	N	S	H	O
TICN	●●	●●	●●	●●	●		

DIN 2174		Designation TICN	D _N	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N
		D7166706-M8X1	MF 8x1	1	90	18	67	6	4,9	8	5
		D7166706-M10X1	MF 10x1	1	90	20	67	7	5,5	8	5
		D7166706-M10X1.25	MF 10x1.25	1,25	100	20	77	7	5,5	8	5
		D7166706-M12X1	MF 12x1	1	100	21	73	9	7	10	5
		D7166706-M12X1.5	MF 12x1.5	1,5	100	21	73	9	7	10	5
		D7166706-M14X1.5	MF 14x1.5	1,5	100	21	71	11	9	12	6
		D7166706-M16X1.5	MF 16x1.5	1,5	100	21	58	12	9	12	6

B6

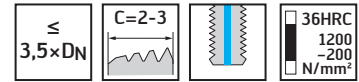


Solid carbide machine thread formers

Protodyn® S HSC



– For long-chipping materials



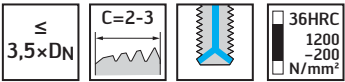
	P	M	K	N	S	H	O
TICN	●	●	●	●	●	●	●

DIN 2174										
	Designation	D_N	P mm	l_1 mm	L_c mm	l_3 mm	d_1 h6 mm	□ mm	l_g mm	N
	TICN									
	HP8166716-M8X1	MF 8x1	1	90	12	67	6	4,9	8	5
	HP8166716-M10X1	MF 10x1	1	90	14	67	7	5,5	8	5
	HP8166716-M12X1.5	MF 12x1.5	1,5	100	21	73	9	7	10	5
	HP8166716-M14X1.5	MF 14x1.5	1,5	100	21	71	11	9	12	6
	HP8166716-M16X1.5	MF 16x1.5	1,5	100	21	58	12	9	12	6

Solid carbide machine thread formers
Protodyn® S HSC

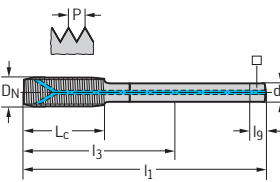


– For long-chipping materials

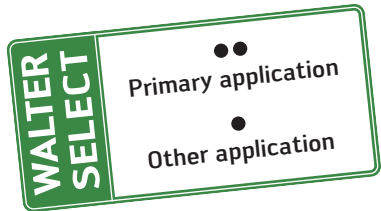


	P	M	K	N	S	H	O
TICN	●●	●		●●	●		

DIN 2174



Designation TICN	DN	P mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h6 mm	mm	l ₉ mm	N
HP8166746-M12X1.5	MF 12x1.5	1,5	100	21	73	9	7	10	5
HP8166746-M14X1.5	MF 14x1.5	1,5	100	21	71	11	9	12	6
HP8166746-M16X1.5	MF 16x1.5	1,5	100	21	58	12	9	12	6

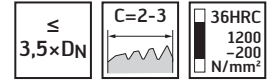


HSS-E machine thread formers

Protodyn® S Plus

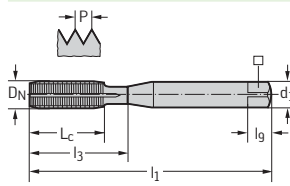


– For long-chipping materials



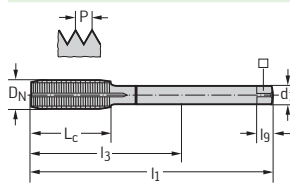
	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●

DIN 2184-1



Designation TIN	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N mm
DP2261705-UNC2	UNC 2-56	2,184	45	7	12	2,8	2,1	5	3
DP2261705-UNC4	UNC 4-40	2,845	56	9	18	3,5	2,7	6	4
DP2261705-UNC6	UNC 6-32	3,505	56	11	20	4	3	6	4
DP2261705-UNC8	UNC 8-32	4,166	63	12	21	4,5	3,4	6	5
DP2261705-UNC10	UNC 10-24	4,826	70	13	25	6	4,9	8	5
DP2261705-UNC1/4	UNC 1/4-20	6,35	80	15	30	7	5,5	8	5
DP2261705-UNC5/16	UNC 5/16-18	7,938	90	18	35	8	6,2	9	5
DP2261705-UNC3/8	UNC 3/8-16	9,525	100	20	39	10	8	11	5

DIN 2184-1



Designation TIN	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l _g mm	N mm
DP2266705-UNC7/16	UNC 7/16-14	11,113	100	20	76	8	6,2	9	5
DP2266705-UNC1/2	UNC 1/2-13	12,7	110	23	83	9	7	10	6
DP2266705-UNC5/8	UNC 5/8-11	15,875	110	25	68	12	9	12	6

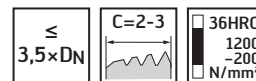
B6

HSS-E machine thread formers

Protodyn® S Plus

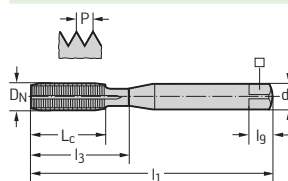


– For long-chipping materials



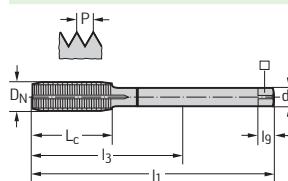
	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●

DIN 2184-1

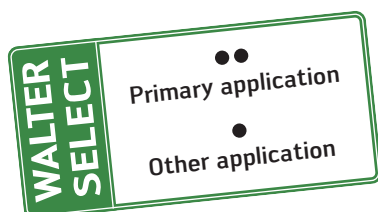


Designation TIN	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N mm
DP2361705-UNF2	UNF 2-64	2,184	45	7	12	2,8	2,1	5	3
DP2361705-UNF4	UNF 4-48	2,845	56	9	18	3,5	2,7	6	4
DP2361705-UNF6	UNF 6-40	3,505	56	11	20	4	3	6	4
DP2361705-UNF8	UNF 8-36	4,166	63	12	21	4,5	3,4	6	5
DP2361705-UNF10	UNF 10-32	4,826	70	13	25	6	4,9	8	5
DP2361705-UNF1/4	UNF 1/4-28	6,35	80	15	30	7	5,5	8	5
DP2361705-UNF5/16	UNF 5/16-24	7,938	90	18	35	8	6,2	9	5
DP2361705-UNF3/8	UNF 3/8-24	9,525	100	20	39	10	8	11	5

DIN 2184-1



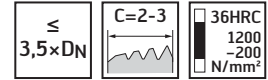
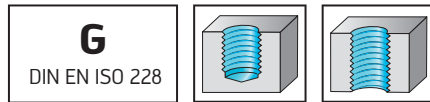
Designation TIN	D _N -P	D _N mm	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	mm	l ₉ mm	N mm
DP2366705-UNF7/16	UNF 7/16-20	11,113	100	20	76	8	6,2	9	5
DP2366705-UNF1/2	UNF 1/2-20	12,7	100	21	73	9	7	10	6
DP2366705-UNF5/8	UNF 5/8-18	15,875	100	21	58	12	9	12	6



HSS-E machine thread formers Protodyn® S Plus



– For long-chipping materials



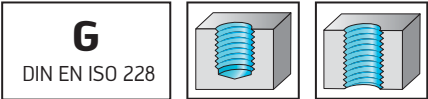
	P	M	K	N	S	H	O
TIN	●	●	●	●	●	●	●

DIN 2189											
	Designation	D _N -P	D _N mm	Threads per inch	l ₁ mm	L _c mm	l ₃ mm	d ₁ h9 mm	□ mm	l ₉ mm	N mm
	TIN										
	DP2466705-G1/8	G 1/8-28	9,728	28	90	20	67	7	5,5	8	5
	DP2466705-G1/4	G 1/4-19	13,157	19	100	21	71	11	9	12	6
	DP2466705-G3/8	G 3/8-19	16,662	19	100	21	58	12	9	12	6
	DP2466705-G1/2	G 1/2-14	20,955	14	125	24	80	16	12	15	7
	DP2466705-G3/4	G 3/4-14	26,441	14	140	26	77	20	16	19	8
	DP2466705-G1	G 1"-11	33,249	11	160	28	93	25	20	23	10

HSS-E machine thread formers
Protodyn® SF

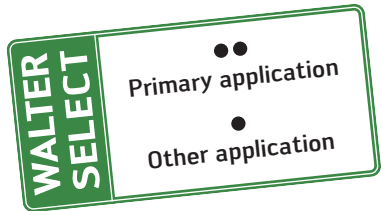


– For long-chipping materials



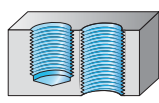
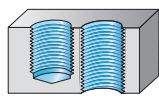
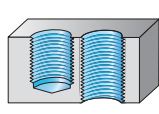
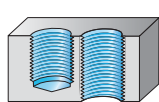
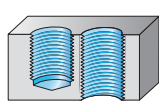
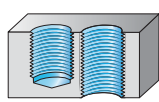
	P	M	K	N	S	H	O
TICN	●●	●●	●●	●●	●		

DIN 2189											
	Designation	D _N -P	D _N	Threads	l ₁	L _c	l ₃	d ₁	□	l ₉	N
	TICN		mm	per inch	mm	mm	mm	h9 mm	mm	mm	mm
	D7466706-G1/8	G 1/8-28	9,728	28	90	20	67	7	5,5	8	5
	D7466706-G1/4	G 1/4-19	13,157	19	100	21	71	11	9	12	6
	D7466706-G3/8	G 3/8-19	16,662	19	100	21	58	12	9	12	6
	D7466706-G1/2	G 1/2-14	20,955	14	125	24	80	16	12	15	7



Type description

Thread forming

Type description	Machining	Materials							Thread depth	Page
		P	M	K	N	S	H	O		
		Steel	Stainless steel	Cast iron	NF metals	Materials with difficult cutting properties	Hard materials	Other		
Protodyn® (S) Eco Plus  – High-tech thread former for universal use – For wet and MQL machining		••	••		••	•			3,5 × D _N	B 1038
Protodyn® (S) Plus  – For universal application		••	••		••	•			3,5 × D _N	B 1046
Protodyn® S Synchrospeed  – For universal application – Specially designed for synchronous machining – Shank tolerance h6 – Weldon clamping surface		••	••		••	•			3,5 × D _N	B 1042
Protodyn® S Eco Inox  – Specially designed for machining stainless steels with emulsion		•	••		•	•			3,5 × D _N	B 1044
Protodyn® Eco LM  – For soft materials with tendency to cause jamming		•			••	••			2,0 × D _N	B 1045
Protodyn® (S) HSC  – For universal application – Solid carbide thread formers – For high forming speeds and long tool life – Shank tolerance h6		••	•		••	•			4,0 × D _N	B 1058

- Primary application
- Additional application

Product families

Thread formers

Eco Inox	Specially designed for machining stainless steels with emulsion
Eco LM	For soft materials with tendency to cause jamming
Eco Plus	High-tech thread former for universal use
HSC	Solid carbide thread former for high forming speeds and long tool life
Plus	For universal application
Synchrospeed	Specially designed for synchronous machining

Thread forming process

Basic principles

Thread forming is a non-cutting process that uses cold forming to create internal threads. Displacement of the material forces the material to yield. This creates a compressed thread profile. This process does not require the flutes that would be required for thread tapping, which increases the stability of the tool.

The combination of cold forming and the uninterrupted chamfer profile of formed threads (compare the picture on the right) significantly increases both the pull-out strength under static load and the fatigue strength under dynamic load. In contrast, the interrupted chamfer profile is used in thread tapping and thread milling (compare the picture on the right).

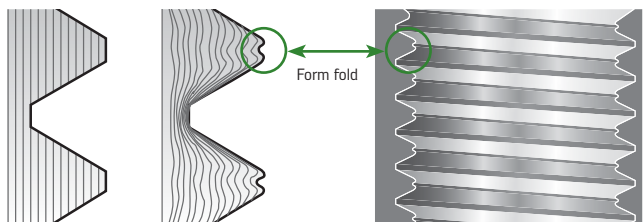
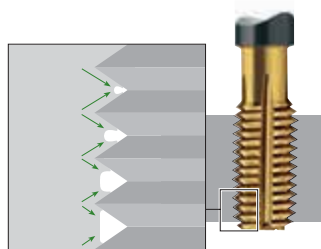
Please note that there is always a form fold in the area of the crest on formed threads. For this reason, thread forming is not permitted in all industries. Specific restrictions are listed below:

- Food industry and medical technology (germ formation around the form fold)
- Automatic component screw connections (screw may jam in the form fold)
- Generally not permitted for use in aircraft construction

Thread forming is perfectly suited for mass production – for example in the automotive industry. Extremely reliable processes can be implemented as a result of the non-cutting creation of threads in combination with high tool stability thanks to the closed polygon profile. In addition, in contrast to tapping, higher cutting parameters can often be achieved while also improving the tool life quantity. Thread forming requires a higher torque compared to tapping.

Note:

When carrying out thread forming, the pilot hole diameter is subject to tighter tolerances than when carrying out tapping and thread milling. This means that there are some cases in which thread forming is not a more cost-effective alternative. It is therefore essential to consider the circumstances of each individual case.



Applications and limits of thread forming

Approx. 65% of all materials to be machined in industry are formable. The limits are illustrated below:

- Brittle materials with elongation at fracture lower than 7% such as:
 - GJL (grey cast iron)
 - Si alloys with a silicon content of > 12%
 - Short-chipping Cu-Zn alloys
 - Thermosetting plastics
- Thread pitch > 3 mm
(forming at pitches ≤ 1.5 mm is particularly cost-effective)
- Tensile strength > 1200-1400 N/mm²

Typical materials used in thread forming are:

- Steel
- Stainless steel
- Soft copper alloys
- Al wrought alloys

Rule of thumb:

$$\text{Pilot hole diameter} = \text{nominal diameter} - f \times \text{pitch}$$

- * 6H tolerance: $f = 0.45$;
- 6G tolerance: $f = 0.42$

Example: M10 dimensions

$$\text{Pilot hole diameter} \rightarrow 10.0 \text{ mm} - 0.45 \times 1.5 \text{ mm} = 9.325 \text{ mm} = \mathbf{9.33 \text{ mm}}$$

(continued)

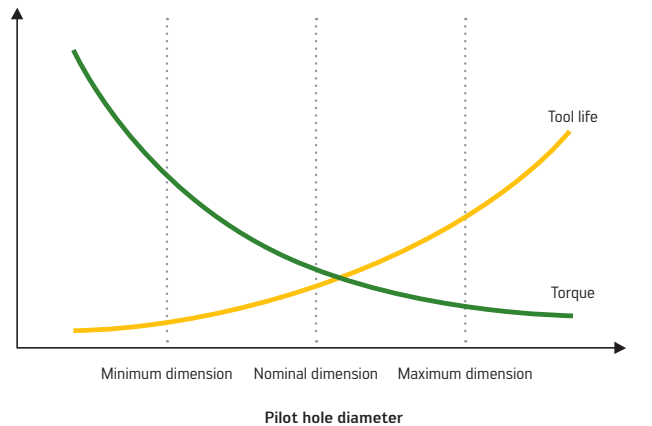
Effect of the pilot hole diameter

The pilot hole diameter has a significant impact on the **thread forming process**. It affects the required torque and the tool life quantity of the thread former, as well as the formation of the thread. These relationships are illustrated in the adjacent diagram.

Note:

Interdependency of the pilot hole diameter and the thread core diameter:

If the core hole is drilled 0.04 mm larger, the thread core diameter (after forming) increases by at least 0.08 mm – i.e. by a factor of two as a minimum.



* Tolerance of the core diameter produced in accordance with DIN 13-50

Example: M16 × 1.5-6H, 42CrMo4; $R_m = 1100 \text{ N/mm}^2$

Pilot hole diameter: 15.22 mm
→ Core diameter: 14.37 mm



Pilot hole diameter: 15.3 mm
→ Core diameter: 14.51 mm



Pilot hole diameter: 15.34 mm
→ Core diameter: 14.62 mm



B 6

Larger core diameters are permitted for formed threads in accordance with DIN 13-50 than for thread tapping: For example, for a thread formed with tolerance class 6H, the minimum thread core diameter must comply with tolerance class 6H, but the maximum thread core diameter is based on tolerance class 7H. This correlation is shown with an example in the adjacent diagram.

Practical tip:

Especially in mass production, it is worth optimising the pilot hole diameter. The following applies:

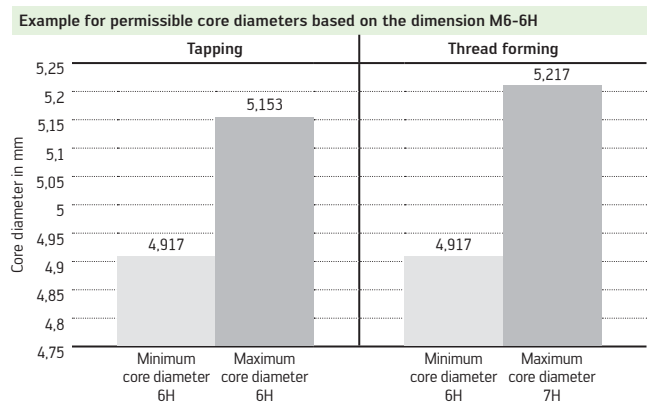
The pilot hole diameter should be as large as possible, but as small as necessary.

The larger the pilot hole diameter:

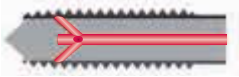
- The higher the tool life quantity will be
- The simpler and more reliable the forming process will be
- The lower the required torque will be

Ensure that the thread remains true to gauge.

The recommended pilot hole diameters can be found in the table on page B 1151.



Modifications

Thread formers			
		Effect	Side effect
Chamfer/Lead form D		Improved tool life quantity	Slightly increased cycle time
Chamfer/Lead form E		Threads nearly to the bottom of the hole and slightly reduced cycle time	Lower tool life quantity
Radial coolant outlets		Increased tool life thanks to improved cooling and lubrication conditions (for deep threads and demanding materials)	Higher purchase price
Lubrication grooves on the shank		Increased tool life thanks to improved cooling and lubrication conditions (not as efficient as radial coolant outlets)	Cost-effective alternative to radial coolant outlets
Increased overall length		Enables machining of areas that are difficult to access	–
Coatings and surface treatments		Increased performance	Potentially higher purchase price

Solutions

Thread forming is extremely reliable. The benefits of this method come to the fore in particular for deep blind holes in soft or tough materials, as these applications are the most likely to cause problems relating to chip removal when carrying out tapping.

Thread forming is the method of choice for such applications. Furthermore, the very materials that most frequently cause chipping problems (such as St52, 16MnCr5 or C15) are extremely well-suited to forming.

Thread forming is also beneficial for applications that require an extremely high surface quality, as the depths of surface roughness of formed threads are generally much lower than those of cut threads.

Despite the benefits of non-cutting creation of threads, there are certain points that should be borne in mind for thread forming as well in order to guarantee a reliable process:

- The pilot hole diameter has a tighter tolerance (e.g. ± 0.05 mm for M6) in comparison to tapping
- It must be ensured that no chips resulting from drilling remain in the core hole. This can be ensured by using a twist drill with internal cooling or using a thread former with an axial coolant outlet. In the latter case, the thread former should be positioned over the pilot hole for a short period before forming starts.
- The torque is generally higher compared to tapping. This means that the drive power of the machine must be taken into account, especially for larger threads.
- The required torque for thread forming is higher than for tapping; it may be necessary to increase the chuck setting value as a result.
- Greater attention must be paid to the cooling lubricant and the cooling lubricant supply when carrying out forming; the tool running dry, even for a short period, could result in rejects and tool breakage. This is due to the effect of higher surface pressure on the forming edges and the narrower cross section of the lubrication grooves used in forming compared to the flutes of taps. The smaller lubrication grooves give the thread former greater stability, which in turn is required due to the increased torque. Larger lubrication grooves would cause the formed edges to crack due to the higher forces applied.
- The coefficient of friction decreases with each coating as the temperature increases. Higher forming speeds can therefore lead to improved tool life quantity.
- Well-known automotive manufacturers often stipulate that the threads must comply with a specific thread overlap, which can be achieved using special solutions – the most important factor is ensuring a precise pilot hole diameter (e.g. via reaming).

Borderline cases for thread forming

It is difficult to set clear limits for forming, because there are always exceptions where limits have been exceeded successfully or not reached at all.

– Tensile strength

Depending on the material and the lubrication conditions, the limit range is approx. 1200-1400 N/mm². However, there have been cases where forming was performed successfully in stainless steel using HSS-E thread formers and in Inconel 718, which is considered to have difficult cutting properties, using solid carbide thread formers. Both materials had a strength of 1450 N/mm².

– Elongation at fracture

In general, a minimum value of 7% is specified for the elongation at fracture. Nevertheless, there have also been cases here where, for instance, GGG-70 has been formed with an elongation at fracture of only approx. 2%. However, in this case, tiny cracks were clearly visible in the flanks, which were considered acceptable by the user. In such cases, it should not be assumed that the forming process will result in increased strength.

– Pitch and thread profile

For pitches greater than 3 mm, the limits for the tensile strengths specified above must be adjusted downwards. Thread types with steep flanks (e.g. 30° for trapezoidal threads) must be assessed on a case-by-case basis.

– Silicon content

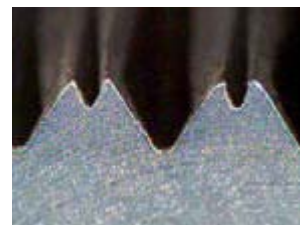
AlSi cast alloys can be formed if the silicon proportion is not higher than 12%. Nevertheless, there have also been cases in which the silicon content was higher than 12%. However, this reduces the surface finish quality and the pull-out strength of the thread.

– Form fold

The unavoidable form fold occurring on the crest of the thread may become problematic if automated processes are used to insert screws. The first threads of the screw sometimes thread into the form fold. Formed threads are also avoided in components used in the food industry and medical technology, because it is not possible to reliably clean away contamination in the form fold by washing.

Note:

Walter Prototyp is able to design special tools in which the form fold can be closed under specific conditions. There have been cases in which customers who were initially opposed to using thread forming decided to permit it for this reason.



Thread profile made with a standard former



Thread profile made with a special former

– Aerospace industry

Thread forming is generally not permitted in the aerospace industry. Changes to the microstructure that occur during thread forming or welding are mainly avoided for applications in this industry.



Thread milling cutters

Designation key	B 1084
Walter Select – Thread milling cutters	B 1086
Product range overview	B 1088
Thread milling cutters without countersink	B 1090
Thread milling cutters with countersink	B 1105
Drill thread milling cutter	B 1107
Orbital thread milling cutters	B 1108
Thread milling cutters with indexable inserts	B 1116

Technical information

Cutting data	B 1120
Type description	B 1122
Product families	B 1123
Grade description	B 1124
Process principles	B 1125
Machining strategies	B 1126
CNC programming	B 1131
Modifications	B 1132
Solutions	B 1133
Shank dimensions in accordance with DIN 6535	B 1134

Thread milling designation key

Example:

H	5	0	5	5	1	1	6
1	2	3	4	5	6	7	8

1	2	3	4
Tool range	Tool type	Thread type	Tool design
H Solid carbide thread milling cutters T Thread milling cutters with indexable inserts	5 Thread milling cutters 9 Toolholder/accessories	0 Metric 1 Metric fine 2 UNC 3 UNF 4 G 5 NPT 6 NPTF	3 Shank thread milling cutter, slim version, short dimensions 5 Shank thread milling cutter 7 Drill thread milling cutter 8 Orbital thread milling cutters

5	6	7	8
Tool design	Shank design	Modifications	Surface treatment
0 Thread milling cutter for external thread 1 Thread milling cutter with 10° helix angle 3 Thread milling cutter for hardened materials ≥ 48 HRC 5 Thread milling cutter with 27° helix angle 6 Thread milling cutter for J thread 7 Orbital thread milling cutter, 2 × D _N 8 Orbital thread milling cutter, 3 × D _N	0 DIN 6535 HA parallel shank 1 DIN 6535 HB parallel shank	0 Without internal coolant 1 Internal coolant supply, axial outlet	0 None 2 NHC 6 TiCN 7 TAX

Example:

T	C	6	10	–	M10	–	W	1	–	W	B	10	RD
1	2	3	4	5	6	7	8	Grade					

1 Tool group T Threading	2 Generation	3 Tool type 6 Solid carbide thread milling cutters	4 Tool type 10 Universal, 20° helix angle, 1.5 × D_N 11 Universal, 20° helix angle, 2.0 × D_N
5 1. Delimiters – Metric	6 Thread dimensions	7 Shank type W Weldon shank	8 Cooling 0 External coolant 1 Axial internal coolant

Grade designation key
for solid carbide and HSS cutting tool materials

Example:

W B 10 RD			
Walter	1	2	3

1	2	3
Substrate	Range of applications	Coating
Solid carbide B J	Wear resistance 05 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 Toughness	RC TiAlN RD TiAlN (+ ZrN)

Walter Select – Thread milling cutters

Step by step to the right tool

STEP 1

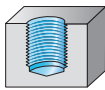
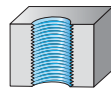
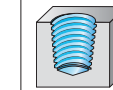
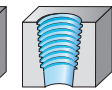
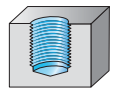
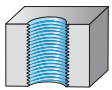
Determine the **material** to be machined from page B 1174 onwards:

Note the **machining group** that corresponds to your material, e.g.: P10.

Code letters	Machining groups	Groups of the materials to be machined	
P	P1–P15	Steel	All types of steel and steel casting, with the exception of steel with an austenitic structure
M	M1–M3	Stainless steel	Austenitic stainless steel, austenitic-ferritic steel and steel casting
K	K1–K7	Cast iron	Grey cast iron, cast iron with spheroidal graphite, malleable cast iron, cast iron with vermicular graphite
N	N1–N10	NF metals	Aluminium and other non-ferrous metals, non-ferrous materials
S	S1–S10	Materials with difficult cutting properties	Heat-resistant special alloys based on iron, nickel and cobalt, titanium and titanium alloys
H	H1–H4	Hard materials	Hardened steel, hardened cast iron materials, chilled cast iron
O	O1–O6	Other	Plastics, glass and carbon fibre reinforced plastics, graphite

STEP 2

Select your intended **application** from the table.

Thread milling								
Machining	Universal					Specific		
								
Thread depth	$1,5 \times D_N$	$2,0 \times D_N$	$3,0 \times D_N$	–	$2,0 \times D_N$	$1,5 \times D_N$	$2,0 \times D_N$	$2,0 \times D_N$
Page	B 1088	B 1088	B 1089	B 1089	B 1089	B 1089	B 1089	B 1089

STEP 3

Select your **tool** from the table from page B 1088 onwards, based on the following criteria:

- Thread depth
- Material group
- Thread type

Walter Select/product range overview – Thread milling cutters

Machining	Universal				
Thread depth	1,5 × D _N	2 × D _N			
Designation	TC610 Supreme	TC611 Supreme	TMC	TMO	TMI
Description	Thread milling cutters	Thread milling cutters	Thread milling cutters with countersink	Orbital thread milling cutters	Thread milling cutters with indexable inserts
Coolant supply	External / axial	External / axial	External / axial	External / axial	Radial
Coating/grade	WJ30RC / WB10RD	WJ30RC / WB10RD	Uncoated / TiCN	TiCN	TiCN
Shank	DIN 6535 HB	DIN 6535 HB	DIN 6535 HA / HB	DIN 6535 HA	DIN 1835 B
Helix angle	20°	20°	27°	15°	0°
Thread type / Page	M / B 1090 MF / B 1092 UNC / B 1096 UNF / B 1098 G / B 1102	M / B 1091 UNC / B 1097 UNF / B 1099	M / B 1105	M / B 1108 UNC / B 1111 UNF / B 1113	M / B 1116 MF / B 1116 G / B 1116
P Steel	••	••	••	••	••
M Stainless steel	••	••	••	••	••
K Cast iron	••	••	••	••	••
N NF metals	••	••	••	••	••
S Materials with					

STEP 4

The corresponding page in the catalogue is specified following tool selection.

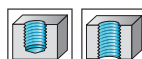
At the bottom right of the catalogue page, you will find a reference to the **cutting data table**.

Solid carbide thread milling cutters TC610 Supreme



– Universal thread milling cutter

M
DIN 13



	P	M	K	N	S	H	O
WJ30RC	••	••	••	••	••	••	••
WB10RD	••	••	••	••	••	••	••

Tool	Designation	P mm	D _c mm	L _c mm	l ₁ mm	l _k mm	d ₃ h6 mm	Z	WB10RD	WJ30RC
Shank DIN 6535 HB	TC610-M6-W0-	1	4,5	9	57	21	6	4	••	••
	TC610-M8-W0-	1,25	6	12,5	57	21	6	4	••	••
	TC610-M10-W0-	1,5	7,5	15	63	27	8	4	••	••
	TC610-M12-W0-	1,75	9,5	19,3	72	32	10	4	••	••
	TC610-M14-W0-	2	10	22	72	32	10	4	••	••
	TC610-M16-W0-	2	12	24	83	38	12	5	••	••
	TC610-M20-W0-	2,5	16	30	92	44	16	6	••	••
	TC610-M24-W0-	3	19	36	104	54	20	6	••	••

Ordering example for the WJ30RC grade: TC610-M6-W0-WJ30RC

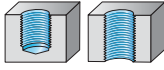
STEP 5

Select the **cutting data** for the tool type from page B 1120 onwards.

Cutting data for thread milling

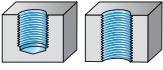
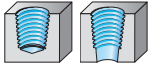
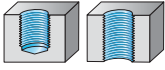
Material group	Overview of the main material groups and code letters			Brinell hardness HB	Tensile strength R _m N/mm ²	Machining group 1	EMA
	C ≤ 0.25%	Annealed					
P Non-alloyed steel	C > 0.25% to ≤ 0.55%	Annealed		125	430	P1	EMA
	C > 0.25% to ≤ 0.55%	Heat-treated		190	640	P2	EMA
	C > 0.55%	Annealed		210	710	P3	EMA
	C > 0.55%	Heat-treated		190	640	P4	EMA
	C > 0.55%	Heat-treated		300	1010	P5	EMA
	Free cutting steel (short-chipping)	Annealed		220	750	P6	EMA
P Low-alloyed steel	Annealed			175	590	P7	EMA
	Heat-treated			285	960	P8	EMA
	Heat-treated			380	1280	P9	EMA
	Heat-treated			430	1480	P10	EMA
P High-alloyed steel and high-alloyed tool steel	Annealed			200	680	P11	EMA
	Heat-treated and tempered			300	1010	P12	EMA

Walter Select/product range overview – Thread milling cutters

Machining	Universal 					
Thread depth	1,5 × D _N	2 × D _N				
Designation	TC610 Supreme	TC611 Supreme	TMC	TMO	TMI	
Description	Thread milling cutters	Thread milling cutters	Thread milling cutters with countersink	Orbital thread milling cutters	Thread milling cutters with indexable inserts	
Coolant supply	External / axial	External / axial	External / axial	External / axial	Radial	
Coating/grade	WJ30RC / WB10RD	WJ30RC / WB10RD	Uncoated / TiCN	TiCN	TiCN	
Shank	DIN 6535 HB	DIN 6535 HB	DIN 6535 HA / HB	DIN 6535 HA	DIN 1835 B	
Helix angle	20°	20°	27°	15°	0°	
Thread type Page	M B 1090 MF B 1092 UNC B 1096 UNF B 1098 G B 1102	M B 1091 UNC B 1097 UNF B 1099	M B 1105	M B 1108 UNC B 1111 UNF B 1113	M B 1116 MF B 1116 G B 1116	
						
P Steel	••	••	••	••	••	
M Stainless steel	••	••	••	••	••	
K Cast iron	••	••	••	••	••	
N NF metals	••	••	••	••	••	
S Materials with difficult cutting properties	••	••	••	••	••	
H Hard materials						
O Other	•	•	•	•	•	

Tools for metric threads (M) can also be used to create fine-pitch threads (MF).
This is only possible if the thread pitch matches.



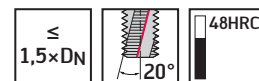
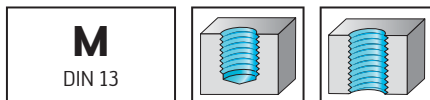
	Universal			Specific			
							
	3 × D _N	–	2 × D _N	1,5 × D _N		2 × D _N	
	TMO	TMG	TME	TMG Ni	TMG HRC	TMO HRC	TMD
	Orbital thread milling cutters	Thread milling cutters	Thread milling cutters	Thread milling cutter for Ni alloys	Thread milling cutter for hard machining	Orbital thread milling cutter for hard machining	Drill thread milling cutter
	External / axial	External	External	External / axial	External	External	Radial
	Uncoated / TiCN	TiCN	TiCN	TiCN	TAX	TAX	TAX / NHC
	DIN 6535 HA	DIN 6535 HB	DIN 6535 HB	DIN 6535 HA	DIN 6535 HA	DIN 6535 HA	DIN 6535 HA
	15°	10°	20°	27°	10°	15°	27°
	M UNC UNF	NPT NPTF B 1103 B 1104	M / MF B 1095	MJ UNJF B 1100 B 1101	M MF B 1093 B 1094	M B 1110	M B 1107
							
	• •	• •	• •	• •	• •	• •	
	• •	• •	• •	• •			
	• •	• •	• •		• •	• •	
	• •	• •	• •	•			• •
	• •	• •	• •	• •	•	•	• •
					• •	• •	
	•	•	•	•	•	•	

Solid carbide thread milling cutters

TC610 Supreme



– Universal thread milling cutter



	P	M	K	N	S	H	O
WJ30RC	●	●	●	●	●	●	●
WB10RD	●	●	●	●	●	●	●

Tool	Designation	P mm	D _c mm	L _c mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z	WB10RD	WJ30RC
Shank DIN 6535 HB 	TC610-M6-W0-	1	4,5	9	57	21	6	4		●
	TC610-M8-W0-	1,25	6	12,5	57	21	6	4		●
	TC610-M10-W0-	1,5	7,5	15	63	27	8	4		●
	TC610-M12-W0-	1,75	9,5	19,3	72	32	10	4		●
	TC610-M14-W0-	2	10	22	72	32	10	4		●
	TC610-M16-W0-	2	12	24	83	38	12	5		●
	TC610-M20-W0-	2,5	16	30	92	44	16	6		●
	TC610-M24-W0-	3	19	36	104	54	20	6		●

Ordering example for the WJ30RC grade: TC610-M6-W0-WJ30RC

Tool	Designation	P mm	D _c mm	L _c mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z	WB10RD	WJ30RC
Shank DIN 6535 HB 	TC610-M6-W1-	1	4,5	9	57	21	6	4	●	●
	TC610-M8-W1-	1,25	6	12,5	57	21	6	4	●	●
	TC610-M10-W1-	1,5	7,5	15	63	27	8	4	●	●
	TC610-M12-W1-	1,75	9,5	19,3	72	32	10	4	●	●
	TC610-M14-W1-	2	10	22	72	32	10	4	●	●
	TC610-M16-W1-	2	12	24	83	38	12	5	●	●
	TC610-M20-W1-	2,5	16	30	92	44	16	6	●	●
	TC610-M24-W1-	3	19	36	104	54	20	6	●	●

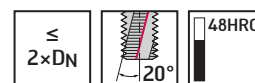
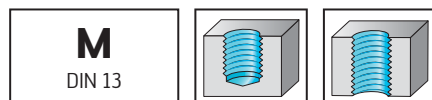
Ordering example for the WJ30RC grade: TC610-M6-W1-WJ30RC

Solid carbide thread milling cutters

TC611 Supreme



– Universal thread milling cutter



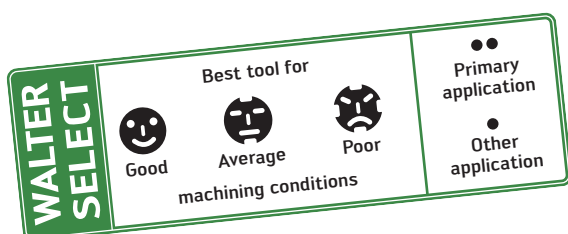
	P	M	K	N	S	H	O
WJ30RC	●	●	●	●	●	●	●
WB10RD	●	●	●	●	●	●	●

Tool	Designation	P mm	D _c mm	L _c mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z	WB10RD	WJ30RC
Shank DIN 6535 HB 	TC611-M6-W0-	1	4,5	12	57	21	6	4		●
	TC611-M8-W0-	1,25	6	16,3	57	21	6	4		●
	TC611-M10-W0-	1,5	7,5	21	63	27	8	4		●
	TC611-M12-W0-	1,75	9,5	24,5	72	32	10	4		●
	TC611-M14-W0-	2	10	28	80	40	10	4		●
	TC611-M16-W0-	2	12	32	89	44	12	5		●
	TC611-M20-W0-	2,5	16	40	105	57	16	6		●
	TC611-M24-W0-	3	19	48	118	68	20	6		●

Ordering example for the WJ30RC grade: TC611-M6-W0-WJ30RC

Tool	Designation	P mm	D _c mm	L _c mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z	WB10RD	WJ30RC
Shank DIN 6535 HB 	TC611-M6-W1-	1	4,5	12	57	21	6	4	●	●
	TC611-M8-W1-	1,25	6	16,3	57	21	6	4	●	●
	TC611-M10-W1-	1,5	7,5	21	63	27	8	4	●	●
	TC611-M12-W1-	1,75	9,5	24,5	72	32	10	4	●	●
	TC611-M14-W1-	2	10	28	80	40	10	4	●	●
	TC611-M16-W1-	2	12	32	89	44	12	5	●	●
	TC611-M20-W1-	2,5	16	40	105	57	16	6	●	●
	TC611-M24-W1-	3	19	48	118	68	20	6	●	●

Ordering example for the WJ30RC grade: TC611-M6-W1-WJ30RC

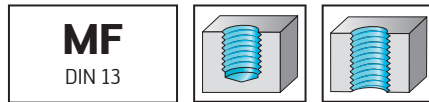
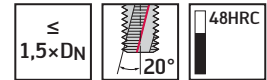


Solid carbide thread milling cutters

TC610 Supreme



– Universal thread milling cutter



	P	M	K	N	S	H	O
WJ30RC	●	●	●	●	●	●	●
WB10RD	●	●	●	●	●	●	●

Tool	Designation	P mm	D _c mm	L _c mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z	WB10RD	WJ30RC
Shank DIN 6535 HB 	TC610-M6X0.5-W0-	0,5	4,8	9	57	21	6	5		●
	TC610-M8X0.75-W0-	0,75	6	12	57	21	6	5		●
	TC610-M8X1-W0-	1	6	12	57	21	6	4		●
	TC610-M10X0.5-W0-	0,5	8	15	63	27	8	7		●
	TC610-M10X1-W0-	1	8	15	63	27	8	5		●
	TC610-M12X1-W0-	1	10	18	72	32	10	6		●
	TC610-M12X1.25-W0-	1,25	10	18,8	72	32	10	6		●
	TC610-M12X1.5-W0-	1,5	10	18	72	32	10	5		●
	TC610-M14X1-W0-	1	12	21	83	38	12	7		●
	TC610-M14X1.5-W0-	1,5	12	21	83	38	12	6		●
	TC610-M16X1-W0-	1	14	24	83	38	14	7		●
	TC610-M16X1.5-W0-	1,5	14	24	83	38	14	6		●
	TC610-M18X1-W0-	1	16	27	92	44	16	8		●
	TC610-M18X1.5-W0-	1,5	16	27	92	44	16	7		●
	TC610-M20X2-W0-	2	16	30	92	44	16	6		●
	TC610-M24X2-W0-	2	20	36	104	54	20	7		●
	TC610-M28X2-W0-	2	25	42	121	65	25	8		●

Ordering example for the WJ30RC grade: TC610-M6X0.5-W0-WJ30RC

Tool	Designation	P mm	D _c mm	L _c mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z	WB10RD	WJ30RC
Shank DIN 6535 HB 	TC610-M6X0.5-W1-	0,5	4,8	9	57	21	6	5		●
	TC610-M8X0.75-W1-	0,75	6	12	57	21	6	5	●	●
	TC610-M8X1-W1-	1	6	12	57	21	6	4	●	●
	TC610-M10X0.5-W1-	0,5	8	15	63	27	8	7		●
	TC610-M10X1-W1-	1	8	15	63	27	8	5	●	●
	TC610-M12X1-W1-	1	10	18	72	32	10	6	●	●
	TC610-M12X1.25-W1-	1,25	10	18,8	72	32	10	6		●
	TC610-M12X1.5-W1-	1,5	10	18	72	32	10	5	●	●
	TC610-M14X1-W1-	1	12	21	83	38	12	7	●	●
	TC610-M14X1.5-W1-	1,5	12	21	83	38	12	6	●	●
	TC610-M16X1-W1-	1	14	24	83	38	14	7	●	●
	TC610-M16X1.5-W1-	1,5	14	24	83	38	14	6	●	●
	TC610-M18X1-W1-	1	16	27	92	44	16	8	●	●
	TC610-M18X1.5-W1-	1,5	16	27	92	44	16	7	●	●
	TC610-M20X2-W1-	2	16	30	92	44	16	6	●	●
	TC610-M24X2-W1-	2	20	36	104	54	20	7		●
	TC610-M28X2-W1-	2	25	42	121	65	25	8		●

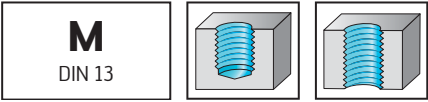
Ordering example for the WJ30RC grade: TC610-M6X0.5-W1-WJ30RC



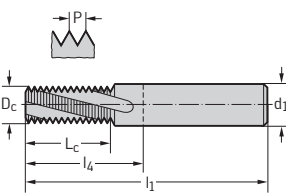
Solid carbide thread milling cutters TMG HRC

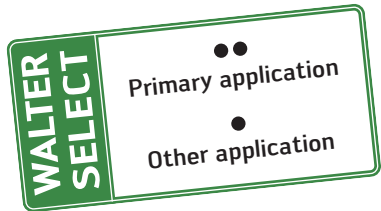


– Thread milling cutters for hardened materials



	P	M	K	N	S	H	O
TAX	●●	●●	●●	●●	●●	●●	●●

Tool	Designation TAX	P mm	D _c mm	L _c mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z
Shank DIN 6535 HA 	H5033008-M6	1	4,5	10	57	21	6	4
	H5033008-M8	1,25	6	12,5	57	21	6	5
	H5033008-M10	1,5	8	16,5	63	27	8	5
	H5033008-M12	1,75	9	19,3	72	32	10	5
	H5033008-M16	2	12	26	83	38	12	5

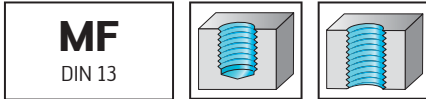


Solid carbide thread milling cutters

TMG HRC

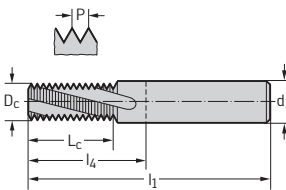


– Thread milling cutters for hardened materials



	P	M	K	N	S	H	O
TAX	●	●	●	●	●	●	●

Tool	Designation TAX	P mm	D _c mm	L _c mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z
Shank DIN 6535 HA	H5133008-M12X1	1	10	20	72	32	10	5
	H5133008-M14X1.5	1,5	12	27	83	38	12	6



Solid carbide thread milling cutters

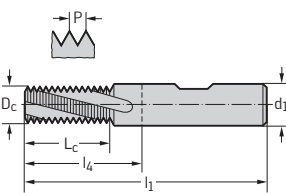
TME

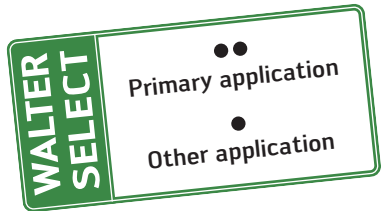


– Universal thread milling cutter for external thread



	P	M	K	N	S	H	O
TICN	●	●	●	●	●	●	●

Tool	Designation TICN	P mm	D _c mm	L _c mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z
	Shank DIN 6535 HB							
	H5150106-M10X1	1	10	16	72	32	10	4
	H5150106-M12X1.5	1,5	12	22,5	83	38	12	5
	H5150106-M16X1	1	16	30	92	44	16	6
	H5150106-M16X1.25	1,25	16	30	92	44	16	6
	H5150106-M16X1.5	1,5	16	30	92	44	16	6
	H5150106-M16X1.75	1,75	16	29,8	92	44	16	6
	H5150106-M16X2	2	16	30	92	44	16	6
	H5150106-M20X3	3	20	42	104	54	20	6

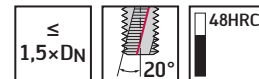
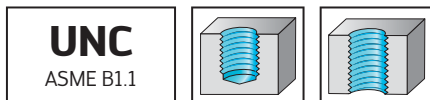


Solid carbide thread milling cutters

TC610 Supreme



– Universal thread milling cutter



	P	M	K	N	S	H	O
WJ30RC	●	●	●	●	●	●	●

Tool	Designation	P Threads per inch	D _c mm	L _c mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z	WJ30RC
Shank DIN 6535 HB 	TC610-UNC1/4-W0-	20	4,8	10,2	57	21	6	3	●
	TC610-UNC5/16-W0-	18	5,5	12,7	57	21	6	4	●
	TC610-UNC3/8-W0-	16	7,5	14,3	63	27	8	4	●
	TC610-UNC7/16-W0-	14	8	18,1	63	27	8	4	●
	TC610-UNC9/16-W0-	12	10	19,5	72	32	10	4	●
	TC610-UNC1/2-W0-	13	10	19,5	72	32	10	4	●
	TC610-UNC5/8-W0-	11	12	25,4	83	38	12	5	●
	TC610-UNC3/4-W0-	10	14	30,5	90	45	14	5	●
	TC610-UNC7/8-W0-	9	16	33,9	98	50	16	5	●
	TC610-UNC1-W0-	8	18	38,1	104	54	20	5	●

Ordering example for the WJ30RC grade: TC610-UNC1/4-W0-WJ30RC

Tool	Designation	P Threads per inch	D _c mm	L _c mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z	WJ30RC
Shank DIN 6535 HB 	TC610-UNC1/4-W1-	20	4,8	10,2	57	21	6	3	●
	TC610-UNC5/16-W1-	18	5,5	12,7	57	21	6	4	●
	TC610-UNC3/8-W1-	16	7,5	14,3	63	27	8	4	●
	TC610-UNC7/16-W1-	14	8	18,1	63	27	8	4	●
	TC610-UNC9/16-W1-	12	10	19,5	72	32	10	4	●
	TC610-UNC1/2-W1-	13	10	19,5	72	32	10	4	●
	TC610-UNC5/8-W1-	11	12	25,4	83	38	12	5	●
	TC610-UNC3/4-W1-	10	14	30,5	90	45	14	5	●
	TC610-UNC7/8-W1-	9	16	33,9	98	50	16	5	●
	TC610-UNC1-W1-	8	18	38,1	104	54	20	5	●

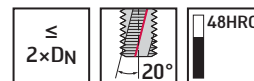
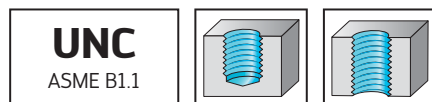
Ordering example for the WJ30RC grade: TC610-UNC1/4-W1-WJ30RC

Solid carbide thread milling cutters

TC611 Supreme



– Universal thread milling cutter



	P	M	K	N	S	H	O
WJ30RC	●	●	●	●	●	●	●

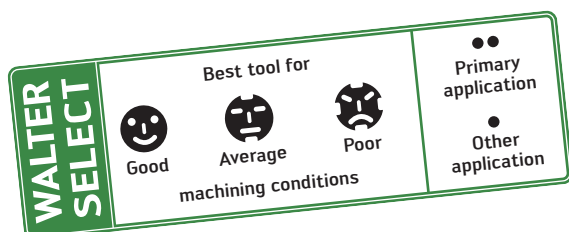
Tool	Designation	P Threads per inch	D _c mm	L _c mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z	WJ30RC
Shank DIN 6535 HB 	TC611-UNC1/4-W0-	20	4,8	12,7	57	21	6	3	●
	TC611-UNC5/16-W0-	18	5,5	16,9	57	21	6	4	●
	TC611-UNC3/8-W0-	16	7,5	19,1	63	27	8	4	●
	TC611-UNC7/16-W0-	14	8	23,6	68	32	8	4	●
	TC611-UNC9/16-W0-	12	10	29,6	80	40	10	4	●
	TC611-UNC1/2-W0-	13	10	25,4	76	36	10	4	●
	TC611-UNC5/8-W0-	11	12	32,3	90	45	12	5	●
	TC611-UNC3/4-W0-	10	14	38,1	98	53	14	5	●
	TC611-UNC7/8-W0-	9	16	45,2	108	60	16	5	●
	TC611-UNC1-W0-	8	18	50,8	116	68	20	5	●

Ordering example for the WJ30RC grade: TC611-UNC1/4-W0-WJ30RC

Tool	Designation	P Threads per inch	D _c mm	L _c mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z	WJ30RC
Shank DIN 6535 HB 	TC611-UNC1/4-W1-	20	4,8	12,7	57	21	6	3	●
	TC611-UNC5/16-W1-	18	5,5	16,9	57	21	6	4	●
	TC611-UNC3/8-W1-	16	7,5	19,1	63	27	8	4	●
	TC611-UNC7/16-W1-	14	8	23,6	68	32	8	4	●
	TC611-UNC9/16-W1-	12	10	29,6	80	40	10	4	●
	TC611-UNC1/2-W1-	13	10	25,4	76	36	10	4	●
	TC611-UNC5/8-W1-	11	12	32,3	90	45	12	5	●
	TC611-UNC3/4-W1-	10	14	38,1	98	53	14	5	●
	TC611-UNC7/8-W1-	9	16	45,2	108	60	16	5	●
	TC611-UNC1-W1-	8	18	50,8	116	68	20	5	●

Ordering example for the WJ30RC grade: TC611-UNC1/4-W1-WJ30RC

B7

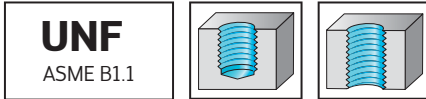


Solid carbide thread milling cutters

TC610 Supreme



– Universal thread milling cutter



	P	M	K	N	S	H	O
WJ30RC	●	●	●	●	●	●	●

Tool	Designation	P Threads per inch	D _c mm	L _c mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z	WJ30RC
Shank DIN 6535 HB 	TC610-UNF10-W0-	32	3,6	7,9	57	21	6	3	●
	TC610-UNF1/4-W0-	28	4,8	10,0	57	21	6	4	●
	TC610-UNF5/16-W0-	24	6	12,7	57	21	6	4	●
	TC610-UNF7/16-W0-	20	8	17,8	63	27	8	4	●
	TC610-UNF9/16-W0-	18	10	22,6	72	32	10	5	●
	TC610-UNF3/4-W0-	16	14	28,6	88	43	14	6	●

Ordering example for the WJ30RC grade: TC610-UNF10-W0-WJ30RC

Tool	Designation	P Threads per inch	D _c mm	L _c mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z	WJ30RC
Shank DIN 6535 HB 	TC610-UNF10-W1-	32	3,6	7,9	57	21	6	3	●
	TC610-UNF1/4-W1-	28	4,8	10,0	57	21	6	4	●
	TC610-UNF5/16-W1-	24	6	12,7	57	21	6	4	●
	TC610-UNF7/16-W1-	20	8	17,8	63	27	8	4	●
	TC610-UNF9/16-W1-	18	10	22,6	72	32	10	5	●
	TC610-UNF3/4-W1-	16	14	28,6	88	43	14	6	●

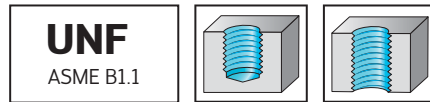
Ordering example for the WJ30RC grade: TC610-UNF10-W1-WJ30RC

Solid carbide thread milling cutters

TC611 Supreme



– Universal thread milling cutter



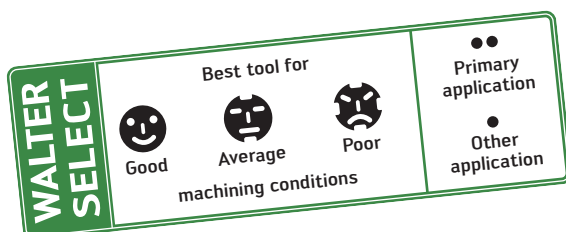
	P	M	K	N	S	H	O
WJ30RC	●	●	●	●	●	●	●

Tool	Designation	P Threads per inch	D _c mm	L _c mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z	WJ30RC
Shank DIN 6535 HB 	TC611-UNF10-W0-	32	3,6	10,3	57	21	6	3	●
	TC611-UNF1/4-W0-	28	4,8	12,7	57	21	6	4	●
	TC611-UNF5/16-W0-	24	6	15,9	57	21	6	4	●
	TC611-UNF7/16-W0-	20	8	22,9	68	32	8	4	●
	TC611-UNF9/16-W0-	18	10	29,6	80	40	10	5	●
	TC611-UNF3/4-W0-	16	14	38,1	98	53	14	6	●

Ordering example for the WJ30RC grade: TC611-UNF10-W0-WJ30RC

Tool	Designation	P Threads per inch	D _c mm	L _c mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z	WJ30RC
Shank DIN 6535 HB 	TC611-UNF10-W1-	32	3,6	10,3	57	21	6	3	●
	TC611-UNF1/4-W1-	28	4,8	12,7	57	21	6	4	●
	TC611-UNF5/16-W1-	24	6	15,9	57	21	6	4	●
	TC611-UNF7/16-W1-	20	8	22,9	68	32	8	4	●
	TC611-UNF9/16-W1-	18	10	29,6	80	40	10	5	●
	TC611-UNF3/4-W1-	16	14	38,1	98	53	14	6	●

Ordering example for the WJ30RC grade: TC611-UNF10-W1-WJ30RC

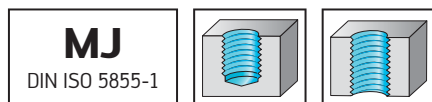
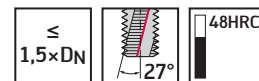


Solid carbide thread milling cutters

TMG Ni



– Thread milling cutters for nickel alloys



	P	M	K	N	S	H	O
TICN	●	●	●	●	●	●	●

Tool	Designation TICN	P mm	D _c mm	L _c mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z
Shank DIN 6535 HA 	H5036006-MJ4	0,7	3	6,3	54	18	6	3
	H5036006-MJ5	0,8	3,9	8	54	18	6	3
	H5036006-MJ6	1	4,8	9	54	20	6	3

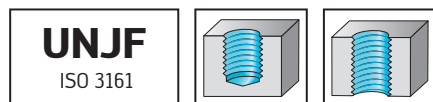
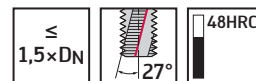
Tool	Designation TICN	P mm	D _c mm	L _c mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z
Shank DIN 6535 HA 	H5036016-MJ8	1,25	6,3	12,5	58	22	8	4
	H5036016-MJ10	1,5	7,5	15	58	22	8	4
	H5036016-MJ12	1,75	9,5	19,3	72	26	10	4

Solid carbide thread milling cutters

TMG Ni

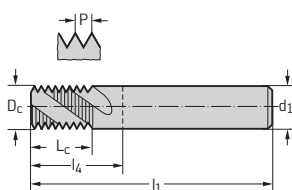


– Thread milling cutters for nickel alloys

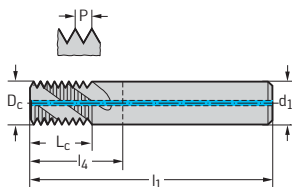


	P	M	K	N	S	H	O
TICN	●	●	●	●	●	●	●

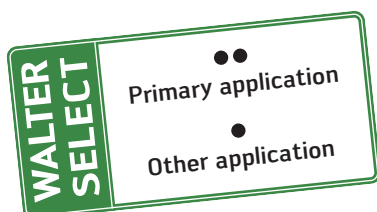
Tool	Designation TICN	P Threads per inch	D _c mm	L _c mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z
Shank DIN 6535 HA	H5336006-UNJF10	32	3,6	7,9	54	18	6	3
	H5336006-UNJF1/4	28	4,8	10,0	54	18	6	3



Tool	Designation TICN	P Threads per inch	D _c mm	L _c mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z
Shank DIN 6535 HA	H5336016-UNJF5/16	24	6,2	12,7	58	22	8	3
	H5336016-UNJF3/8	24	8	14,8	58	22	8	3
	H5336016-UNJF7/16	20	9,2	17,8	72	26	10	4
	H5336016-UNJF1/2	20	10,5	19,1	73	28	12	4



B7

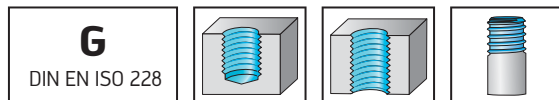
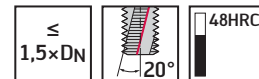


Solid carbide thread milling cutters

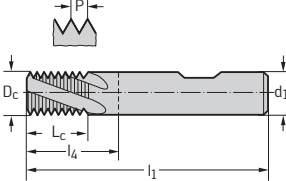
TC610 Supreme



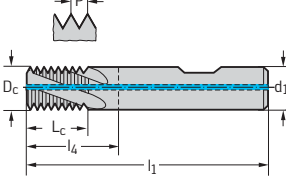
– Universal thread milling cutter



	P	M	K	N	S	H	O
WJ30RC	●	●	●	●	●	●	●

Tool	Designation	P Threads per inch	D _c mm	L _c mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z	WJ30RC
Shank DIN 6535 HB 	TC610-G1/8-W0-	28	6	15,4	57	21	6	5	●
	TC610-G1/4-W0-	19	10	20,1	72	32	10	5	●
	TC610-G3/8-W0-	19	14	25,4	83	38	14	7	●
	TC610-G1/2-W0-	14	16	32,7	96	44	16	6	●
	TC610-G5/8-W0-	14	20	34,5	104	54	20	8	●
	TC610-G1X20-W0-	11	20	50,8	120	75	20	6	●

Ordering example for the WJ30RC grade: TC610-G1/8-W0-WJ30RC

Tool	Designation	P Threads per inch	D _c mm	L _c mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z	WJ30RC
Shank DIN 6535 HB 	TC610-G1/8-W1-	28	6	15,4	57	21	6	5	●
	TC610-G1/4-W1-	19	10	20,1	72	32	10	5	●
	TC610-G3/8-W1-	19	14	25,4	83	38	14	7	●
	TC610-G1/2-W1-	14	16	32,7	96	44	16	6	●
	TC610-G5/8-W1-	14	20	34,5	104	54	20	8	●
	TC610-G1X20-W1-	11	20	50,8	120	75	20	6	●

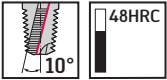
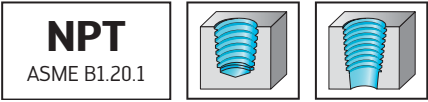
Ordering example for the WJ30RC grade: TC610-G1/8-W1-WJ30RC

Solid carbide thread milling cutters

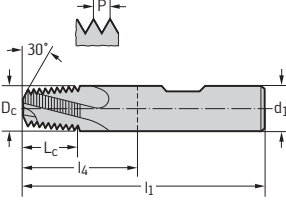
TMG

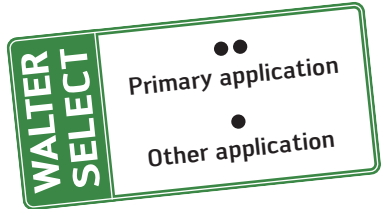


– Universal thread milling cutter



	P	M	K	N	S	H	O
TICN	●	●	●	●	●	●	●

Tool	Designation TICN	P Threads per inch	D _c mm	L _c mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z
	H5551106-NPT1/16	27	5,5	11,50	57	21	6	3
	H5551106-NPT1/8	27	7,9	11,50	58	22	8	3
	H5551106-NPT1/4-3/8	18	9,9	15,92	66	26	10	3
	H5551106-NPT1/2-3/4	14	15,9	20,46	82	34	16	4
	H5551106-NPT1-2	11,5	19,9	27,12	92	42	20	5

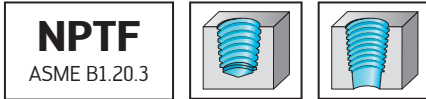
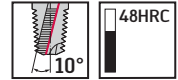


Solid carbide thread milling cutters

TMG

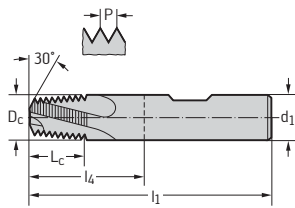


– Universal thread milling cutter



	P	M	K	N	S	H	O
TICN	●	●	●	●	●	●	●

Tool	Designation TICN	P Threads per inch	D _c mm	L _c mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z
Shank DIN 6535 HB	H5651106-NPTF1/16	27	5,5	11,50	57	21	6	3
	H5651106-NPTF1/8	27	7,9	11,50	58	22	8	3
	H5651106-NPTF1/4-3/8	18	9,9	15,92	66	26	10	3
	H5651106-NPTF1/2-3/4	14	15,9	20,46	82	34	16	4
	H5651106-NPTF1-2	11,5	19,9	27,12	92	42	20	5

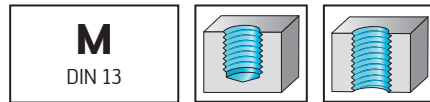


Solid carbide thread milling cutters

TMC

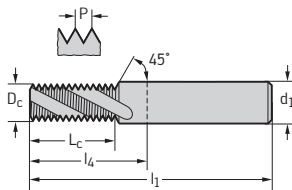


– Universal thread milling cutter with countersink

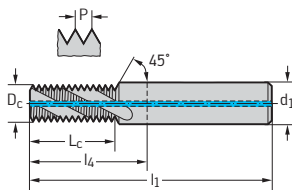


	P	M	K	N	S	H	O
TICN	●	●	●	●	●	●	●
Uncoated	●	●	●	●	●	●	●

	Designation TICN	Designation Uncoated	P mm	D _c mm	L _c mm	l ₁ mm	l ₄ mm	Z
Shank DIN 6535 HA	H5055006-M3	H505500-M3	0,5	2,3	6	57	21	3



	Designation TICN	Designation Uncoated	P mm	D _c mm	L _c mm	l ₁ mm	l ₄ mm	Z
Shank DIN 6535 HA	H5055016-M4	H505501-M4	0,7	3,2	8,4	57	21	3
	H5055016-M5	H505501-M5	0,8	4,1	10,4	57	21	3
	H5055016-M6	H505501-M6	1	4,8	12	63	27	3
	H5055016-M8	H505501-M8	1,3	6,5	16,3	72	32	3
	H5055016-M10	H505501-M10	1,5	8,2	21	83	38	3
	H5055016-M12	H505501-M12	1,8	9,9	24,5	83	38	4
	H5055016-M14	H505501-M14	2	11,6	30	92	44	4
	H5055016-M16	H505501-M16	2	13,6	32	92	44	4



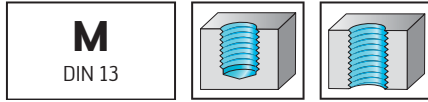
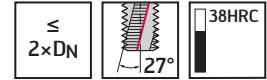
B7

Solid carbide thread milling cutters

TMC

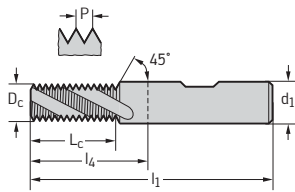


– Universal thread milling cutter with countersink

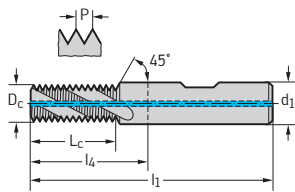


	P	M	K	N	S	H	O
TICN	●	●	●	●	●	●	●

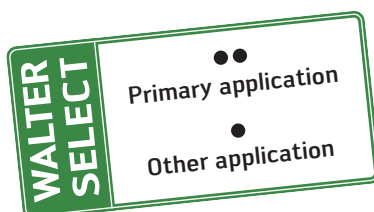
	Designation TICN	P mm	D _c mm	L _c mm	l ₁ mm	l ₄ mm	Z
Shank DIN 6535 HB	H5055106-M3	0,5	2,3	6	57	21	3



	Designation TICN	P mm	D _c mm	L _c mm	l ₁ mm	l ₄ mm	Z
Shank DIN 6535 HB	H5055116-M4	0,7	3,2	8,4	57	21	3
	H5055116-M5	0,8	4,1	10,4	57	21	3
	H5055116-M6	1	4,8	12	63	27	3
	H5055116-M8	1,3	6,5	16,3	72	32	3
	H5055116-M10	1,5	8,2	21	83	38	3
	H5055116-M12	1,8	9,9	24,5	83	38	4
	H5055116-M14	2	11,6	30	92	44	4
	H5055116-M16	2	13,6	32	92	44	4



B7

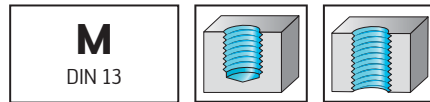
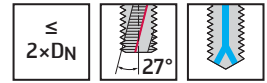


Solid carbide drill thread milling cutters

TMD

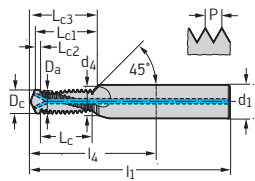


- Drill thread milling cutters for short-chipping materials
- Drilling, countersinking and thread milling in one operation



	P	M	K	N	S	H	O
NHC				••			
TAX			••				

	Designation NHC	Designation TAX	P mm	D _c mm	D _a mm	L _c mm	L _{c3} mm	d ₄ mm	L _{c1} mm	L _{c2} mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z
Shank DIN 6535 HA	H5075011-M6	H5075018-M6	1	5	4,75	11	14,7	6,3	13,8	1	62	26	8	3
	H5075011-M8	H5075018-M8	1,25	6,8	6,42	13,8	18,9	8,3	17,7	1,25	74	34	10	3
	H5075011-M10	H5075018-M10	1,5	8,5	8,08	18	23,7	10,3	22,2	1,5	80	35	12	3
	H5075011-M12	H5075018-M12	1,75	10,3	9,73	21	27,4	12,3	25,5	1,5	90	45	14	3
		H5075018-M16	2	14	13,3	30	37,6	16,3	35,1	1,5	102	54	18	3

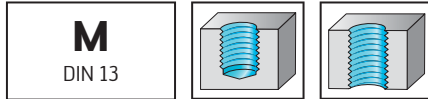


Solid carbide orbital thread milling cutters

TMO



– Universal orbital thread milling cutter



	P	M	K	N	S	H	O
TICN	●	●	●	●	●	●	●

Tool	Designation TICN	P mm	D _c mm	L _c mm	l ₃ mm	d ₂ mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z
Shank DIN 6535 HA	H5087006-M1.6	0,35	1,2	0,53	3,725	0,74	38	10	3	3
	H5087006-M2	0,4	1,55	1	4,6	0,98	57	21	6	3
	H5087006-M2.5	0,45	1,95	1,13	5,675	1,3	57	21	6	3
	H5087006-M3	0,5	2,3	1,25	6,75	1,6	57	21	6	3
	H5087006-M4	0,7	3,1	1,75	9,05	2,1	57	21	6	3
	H5087006-M5	0,8	4	2	11,2	2,9	57	21	6	3
	H5087006-M6	1	4,8	2,5	13,5	3,4	57	21	6	3
	H5087006-M8	1,25	6,4	3,13	17,9	4,7	63	27	8	3
	H5087006-M10	1,5	8,2	3,75	22,3	6,16	72	32	10	4
	H5087006-M12	1,75	9,5	4,38	26,7	7,13	72	27	10	5

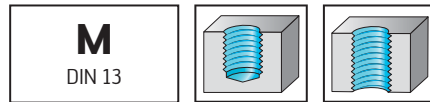
Tool	Designation TICN	P mm	D _c mm	L _c mm	l ₃ mm	d ₂ mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z
Shank DIN 6535 HA	H5087016-M5	0,8	4	2	11,2	2,9	57	21	6	3
	H5087016-M6	1	4,8	2,5	13,5	3,4	57	21	6	3
	H5087016-M8	1,25	6,4	3,13	17,9	4,7	63	27	8	3
	H5087016-M10	1,5	8,2	3,75	22,3	6,16	72	32	10	4
	H5087016-M12	1,75	9,5	4,38	26,7	7,13	72	27	10	5

Solid carbide orbital thread milling cutters

TMO



– Universal orbital thread milling cutter

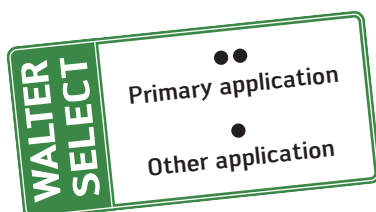


	P	M	K	N	S	H	O
TICN	●	●	●	●	●		●
Uncoated	●	●	●	●	●		●

Tool	Designation TICN	Designation Uncoated	P mm	D _c mm	L _c mm	l ₃ mm	d ₂ mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z
Shank DIN 6535 HA	H5088006-M1.6	H508800-M1.6	0,35	1,2	0,53	5,325	0,74	38	10	3	3
	H5088006-M2	H508800-M2	0,4	1,55	1	6,6	0,98	57	21	6	3
	H5088006-M2.5	H508800-M2.5	0,45	1,95	1,13	8,175	1,3	57	21	6	3
	H5088006-M3	H508800-M3	0,5	2,3	1,25	9,75	1,6	57	21	6	3
	H5088006-M4	H508800-M4	0,7	3,1	1,75	13,05	2,1	57	21	6	3
	H5088006-M5	H508800-M5	0,8	4	2	16,2	2,9	57	21	6	3
	H5088006-M6	H508800-M6	1	4,8	2,5	19,5	3,4	60	24	6	3
	H5088006-M8	H508800-M8	1,25	6,4	3,13	25,875	4,7	68	27	8	3

Tool	Designation TICN	Designation Uncoated	P mm	D _c mm	L _c mm	l ₃ mm	d ₂ mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z
Shank DIN 6535 HA	H5088016-M5		0,8	4	2	16,2	2,9	57	21	6	3
	H5088016-M6		1	4,8	2,5	19,5	3,4	60	24	6	3
	H5088016-M8		1,25	6,4	3,13	25,875	4,7	68	27	8	3

B7

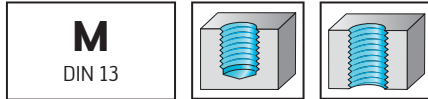


Solid carbide orbital thread milling cutters

TMO HRC

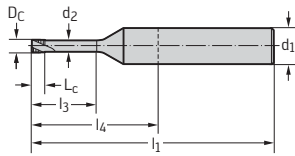


– Orbital thread milling cutter for hardened materials



	P	M	K	N	S	H	O
TAX	●●	●●	●●	●●	●●	●●	●●

Tool	Designation TAX	P mm	D _c mm	L _c mm	l ₃ mm	d ₂ mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z
Shank DIN 6535 HA	H5083008-M2	0,4	1,55	0,6	4,6	0,98	57	21	6	3
	H5083008-M2.5	0,45	1,95	0,68	5,675	1,3	57	21	6	3
	H5083008-M3	0,5	2,3	0,75	6,75	1,6	57	21	6	3
	H5083008-M4	0,7	3,1	1,05	9,05	2,1	57	21	6	3
	H5083008-M5	0,8	4	1,2	11,2	2,9	57	21	6	4
	H5083008-M6	1	4,8	1,5	13,5	3,4	57	21	6	4

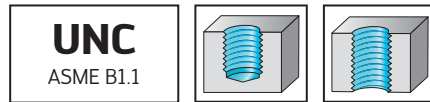


Solid carbide orbital thread milling cutters

TMO

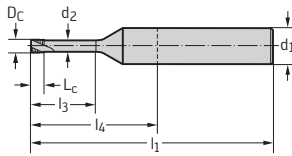


– Universal orbital thread milling cutter

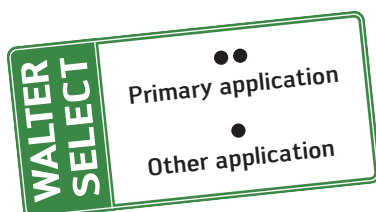
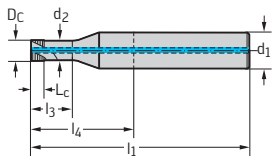


	P	M	K	N	S	H	O
TICN	●	●	●	●	●	●	●

Tool	Designation TICN	Threads per inch	D _c mm	L _c mm	l ₃ mm	d ₂ mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z
Shank DIN 6535 HA	H5287006-UNC4	40	2,1	1,59	21	1,21	57	21	6	3
	H5287006-UNC6	32	2,6	1,99	21	1,5	57	21	6	3
	H5287006-UNC10	24	3,55	2,65	21	2,1	57	21	6	3

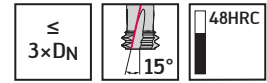


Tool	Designation TICN	Threads per inch	D _c mm	L _c mm	l ₃ mm	d ₂ mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z
Shank DIN 6535 HA	H5287016-UNC1/4	20	4,85	3,18	21	3,11	57	21	6	3
	H5287016-UNC5/16	18	6,2	3,53	27	4,28	63	27	8	3

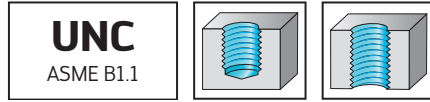


Solid carbide orbital thread milling cutters

TMO

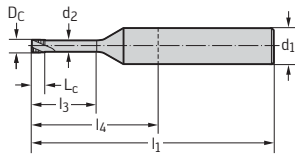


– Universal orbital thread milling cutter



	P	M	K	N	S	H	O
TICN	●	●	●	●	●	●	●
Uncoated	●	●	●	●	●	●	●

Tool	Designation TICN	Designation Uncoated	Threads per inch	D _c mm	L _c mm	l ₃ mm	d ₂ mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z
Shank DIN 6535 HA	H5288006-UNC2	H528800-UNC2	56	1,6	0,68	21	0,95	57	21	6	3
	H5288006-UNC4	H528800-UNC4	40	2,1	1,59	21	1,21	57	21	6	3
	H5288006-UNC6	H528800-UNC6	32	2,6	1,99	21	1,5	57	21	6	3
	H5288006-UNC8	H528800-UNC8	32	3,25	1,98	21	2,15	57	21	6	3
	H5288006-UNC10	H528800-UNC10	24	3,55	2,65	21	2,1	57	21	6	3
	H5288006-UNC1/4	H528800-UNC1/4	20	4,85	3,18	21	3,11	57	21	6	3
	H5288006-UNC5/16	H528800-UNC5/16	18	6,2	3,53	27	4,28	63	27	8	3

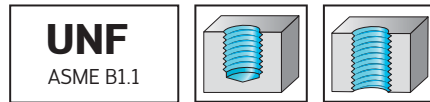


Solid carbide orbital thread milling cutters

TMO

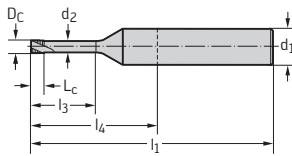


– Universal orbital thread milling cutter

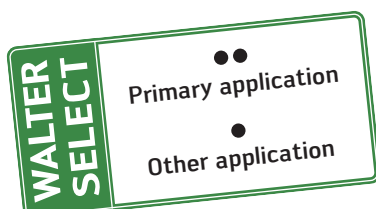
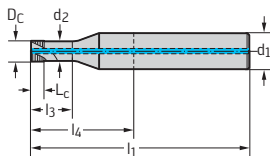


	P	M	K	N	S	H	O
TICN	●	●	●	●	●	●	●

Tool	Designation TICN	Threads per inch	D _c mm	L _c mm	l ₃ mm	d ₂ mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z
Shank DIN 6535 HA	H5387006-UNF10	32	3,85	2,38	21	2,75	57	21	6	3

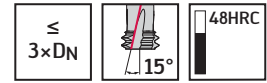


Tool	Designation TICN	Threads per inch	D _c mm	L _c mm	l ₃ mm	d ₂ mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z
Shank DIN 6535 HA	H5387016-UNF1/4	28	5,25	2,72	21	4	57	21	6	3
	H5387016-UNF5/16	24	6,55	3,18	27	5,1	63	27	8	3
	H5387016-UNF3/8	24	7,85	3,18	27	6,4	63	27	8	4

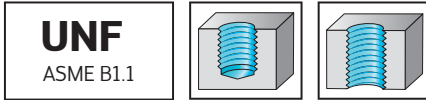


Solid carbide orbital thread milling cutters

TMO

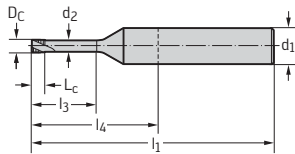


– Universal orbital thread milling cutter



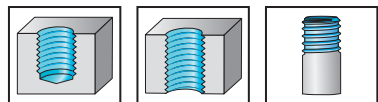
	P	M	K	N	S	H	O
TiCN	●	●	●	●	●	●	●
Uncoated	●	●	●	●	●	●	●

Tool	Designation TiCN	Designation Uncoated	Threads per inch	D _c mm	L _c mm	l ₃ mm	d ₂ mm	l ₁ mm	l ₄ mm	d ₁ h6 mm	Z
Shank DIN 6535 HA		H538800-UNF4	48	2,15	1,59	21	1,36	57	21	6	3
	H5388006-UNF6	H538800-UNF6	40	2,75	1,91	21	1,86	57	21	6	3
	H5388006-UNF10	H538800-UNF10	32	3,85	2,38	21	2,75	57	21	6	3
	H5388006-UNF1/4	H538800-UNF1/4	28	5,25	2,72	21	4	57	21	6	3
	H5388006-UNF5/16	H538800-UNF5/16	24	6,55	3,18	27	5,1	63	27	8	3





Toolholders for indexable inserts



$$\leq 2 \times D_N$$

	P	M	K	N	S	H	O
T91 ..	●	●	●	●	●		●

Tool	Designation	D _C mm	d ₁ mm	d ₂ mm	l ₁ mm	l ₃ mm	Number of indexable inserts	Insert size
Parallel shank with flat in accordance with DIN 1835 B	T9131000-16X3	15,5	16	12,2	91	20,5	1	3
	T9131000-25X4	18	25	13,4	88	30	1	4
	T9131000-25X5	25	25	19	98	40	1	5
	T9111000-16X3	17	16	13,6	90	22	1	3
	T9111000-20X3	20	20	16,6	95	43	1	3
	T9111000-25X5	30	25	24	110	52	1	5
	T9111000-32X5	37	32	31	120	58	1	5
	T9141000-25X3	22	25	18,6	125	25	1	3
	T9141000-32X5	37	32	31	160	98	1	5
	T9161000-25X3	26	25	22,5	100	43	2	3

Assembly parts

	Insert size	3	3	4	5
	Specification	3	3M*	4	5
	Clamping screw for indexable insert	T9111030-3XT10 (Torx 10)	T9111010-3MXT10 (Torx 10)	T9111040-4XT20 (Torx 20)	T9111050-5XT25 (Torx 25)
	Tightening torque	1,5 / 2,0 Nm	1,5 / 2,0 Nm	5,0 Nm	6,0 Nm

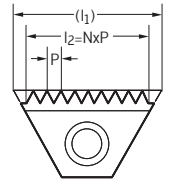
* For metric threads, T9131000-16X3 toolholder

Accessories

	Insert size	3	4	5
	Torx key Designation	FS 1050	–	–
	Screwdriver Designation	–	FS 228	FS 2167
	Key size	Torx 10	Torx 20	Torx 25



Thread cutting insert

**M-MF**

DIN 13

G

DIN EN ISO 228

	P	M	K	N	S	H	O
TiCN	●●	●●	●●	●●	●●		●

	Designation	Thread type	Number of cutting edges	P mm	l ₂ mm	l ₁ mm	N	Insert size
	T0192106-2.5X3	M	1	2,5	12,5	16	5	3
	T0192106-3.0X4	M	1	3	18	22	6	4
	T1192206-3.5X5	M-MF	2	3,5	24,5	27	7	5
	T1192206-4.0X5	M-MF	2	4	24	27	6	5
	T1192206-4.5X5	M-MF	2	4,5	22,5	27	5	5
	T1192206-5.0X5	M-MF	2	5	20	27	4	5
	T1291206-1.0X3	MF	2	1	15	16	15	3
	T1291206-1.5X3	MF	2	1,5	15	16	10	3
	T1291206-1.5X5	MF	2	1,5	25,5	27	17	5
	T1291206-2.0X3	MF	2	2	14	16	7	3
	T1291206-2.0X5	MF	2	2	24	27	12	5
	T1291206-3.0X5	MF	2	3	24	27	8	5
	T4691206-11X3	G, Rp	2	11	13,85	16	6	3
	T4691206-11X5	G, Rp	2	11	23,09	27	10	5
	T4691206-14X3	G, Rp	2	14	14,51	16	8	3

B7



D 1



B 1083

Selection table – Thread milling cutters with indexable inserts

Metric

P	Ø min.	max. thread depth l ₃	Toolholder	Insert	Insert size	
1,0	18,0	20,5	T9131000-16x3	T1291206-1.0x3	3	
	19,0	22,0	T9111000-16x3			
	22,0	43,0	T9111000-20x3			
	24,0	25,0	T9141000-25x3			
	28,0	43,0	T9161000-25x3			
1,5	18,5	20,5	T9131000-16x3	T1291206-1,5x3		5
	20,5	22,0	T9111000-16x3			
	23,5	43,0	T9111000-20x3			
	23,5	25,0	T9141000-25x3			
	29,5	43,0	T9161000-25x3			
	28,5	40,0	T9131000-25x5	T1291206-1,5x5		
	33,5	52,0	T9111000-25x5			
	41,5	58,0	T9111000-32x5			
	41,5	98,0	T9141000-32x5			
2,0	20,0	20,5	T9131000-16x3	T1291206-2.0x3	3	
	21,0	22,0	T9111000-16x3			
	24,0	43,0	T9111000-20x3			
	26,0	25,0	T9141000-25x3			
	31,0	43,0	T9161000-25x3			
	20,0	20,5	T9131000-25x5	T1291206-2,0x5		5
	35,0	52,0	T9111000-25x5			
	42,0	58,0	T9111000-32x5			
	42,0	98,0	T9141000-32x5			
2,5	17,5	20,5	T9111000-16x3	T0192106-2,5x3	4	
3,0	21,0	30,0	T9131000-25x4	T0192106-3.0x4		
3,5	26,5	40,0	T9131000-25x5	T1192206-3,5x5		
4,0	32,0	52,0	T9111000-25x5	T1192206-4,0x5		
4,5	37,5			T1192206-4,5x5		
5,0	43,0			T1192206-5,0x5		

Selection table – Thread milling cutters with indexable inserts

Pipe thread

P	Ø min.	max. thread depth l ₃	Toolholder	Insert	Insert size
14	18,5	20,5	T9131000-16x3	T4691206-14x3	3
	21,0	22,0	T9111000-16x3	T4691206-11x3	
	24,5	43,0	T9111000-20x3		
	28,3	25,0	T9141000-25x3		
11	30,3	20,5	T9131000-16x3		
		22,0	T9111000-16x3		
		43,0	T9111000-20x3		
		25,0	T9111000-25x3		
		25,0	T9141000-25x3		
		43,0	T9161000-25x3		
		40,0	T9131000-25x5	T4691206-11x5	
		52,0	T9111000-25x5		
58,0	T9111000-32x5		5		

Cutting data for thread milling

Material group	 = Cooling lubricant recommended ***			Brinell hardness HB	Tensile strength R _m N/mm²	Machining group ¹			
	Overview of the main material groups and code letters								
P	Non-alloyed steel	C ≤ 0.25%	Annealed	125	430	P1	E M A		
		C > 0.25% to ≤ 0.55%	Annealed	190	640	P2	E M A		
		C > 0.25% to ≤ 0.55%	Heat-treated	210	710	P3	E M A		
		C > 0.55%	Annealed	190	640	P4	E M A		
		C > 0.55%	Heat-treated	300	1010	P5	E M A		
		Free cutting steel (short-chipping)	Annealed	220	750	P6	E M A		
	Low-alloyed steel	Annealed		175	590	P7	E M A		
		Heat-treated		285	960	P8	E M A		
		Heat-treated		380	1280	P9	E M A		
		Heat-treated		430	1480	P10	E M A		
	High-alloyed steel and high-alloyed tool steel	Annealed		200	680	P11	E M A		
		Hardened and tempered		300	1010	P12	E M A		
		Hardened and tempered		380	1280	P13	E M A		
	Stainless steel	Ferritic/martensitic, annealed		200	680	P14	E M A		
		Martensitic, heat-treated		330	1110	P15	E M A		
M	Stainless steel	Austenitic, quench hardened		200	680	M1	E		
		Austenitic, precipitation hardened (PH)		300	1010	M2	E		
		Austenitic/ferritic, duplex		230	780	M3	E		
K	Malleable cast iron	Ferritic		200	400	K1	E M A		
		Pearlitic		260	700	K2	E M A		
	Grey cast iron	Low tensile strength		180	200	K3	E M A		
		High tensile strength/austenitic		245	350	K4	E M A		
	Cast iron with spheroidal graphite	Ferritic		155	400	K5	E M A		
		Pearlitic		265	700	K6	E M A		
	GGV (CGI)			230	400	K7	E M A		
N	Wrought aluminium alloys	Not hardenable		30	–	N1	E M A		
		Hardenable, hardened		100	340	N2	E M A		
	Cast aluminium alloys	≤ 12% Si, not hardenable		75	260	N3	E M A		
		≤ 12% Si, hardenable, hardened		90	310	N4	E M A		
		> 12% Si, not hardenable		130	450	N5	E M A		
	Magnesium-based alloys			70	250	N6	A		
		Copper and copper alloys (bronze/brass)	Non-alloyed, electrolytic copper		100	340	N7	E M A	
			Brass, bronze, red brass		90	310	N8	E M A	
			Cu-alloys, short-chipping		110	380	N9	E M A	
High-tensile, Ampco			300	1010	N10	E M A			
S	Heat-resistant alloys	Fe-based	Annealed	200	680	S1	E		
			Hardened	280	940	S2	E		
		Ni or Co base	Annealed	250	840	S3	E		
			Hardened	350	1180	S4	E		
			Cast	320	1080	S5	E		
	Titanium alloys	Pure titanium		200	680	S6	E		
		α and β alloys, hardened		375	1260	S7	E		
		β alloys		410	1400	S8	E		
	Tungsten alloys			300	1010	S9	E		
	Molybdenum alloys			300	1010	S10	E		
H	Hardened steel	Hardened and tempered		50 HRC	–	H1	M A		
		Hardened and tempered		55 HRC	–	H2	M A		
		Hardened and tempered		60 HRC	–	H3	M A		
	Hardened cast iron	Hardened and tempered		55 HRC	–	H4	M A		
O	Thermoplastics	Without abrasive fillers				O1	E M A		
	Thermosetting plastics	Without abrasive fillers				O2	E M A		
	Plastic, glass fibre reinforced	GFRP				O3	E M A		
	Plastic, carbon fibre reinforced	CFRP				O4	E M A		
	Plastic, aramid fibre reinforced	AFRP				O5	E M A		
	Graphite (technical)			80 Shore		O6	E M A		

¹ The classification of the machining groups can be found from page B 1174 onwards.

* The feed per tooth is valid for a thread depth of 1 × D_N. If deeper threads are machined, it may be necessary to increase the number of radial cuts.

** The feed per tooth for 3 × D_N tools with D_c < 1.6 mm must be reduced by 30-50%.

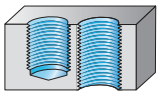
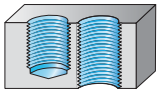
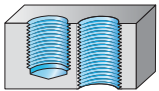
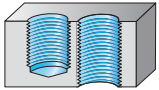
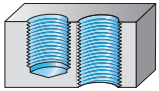
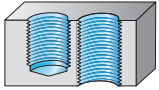
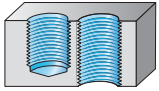
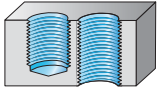
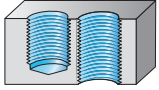
*** Emulsion must always be used for drill thread milling cutters.

The specified cutting data are average standard values. For special applications, adjustment is recommended.
The values in brackets define the number of radial cuts. If no value in brackets is provided, one radial cut is recommended.

	Thread milling cutters*						Orbital thread milling cutters					Drill thread milling cutters*							
	v _c [m/min]		f _z [mm]				v _c [m/min]		f _z [mm]**			v _c [m/min]	D _c ≤ 5 mm		D _c > 5 and ≤ 10 mm		D _c > 10 mm		
	Uncoated	Coated	D _c ≤ 3 mm	D _c > 3 and ≤ 7 mm	D _c > 7 and ≤ 9 mm	D _c > 9 mm	Uncoated	Coated	D _c ≤ 1.5 mm	D _c > 1.5 and ≤ 3 mm	D _c > 3 mm	Coated	f _z [mm]	f [mm/rev]	f _z [mm]	f [mm/rev]	f _z [mm]	f [mm/rev]	
		115	0,015	0,045	0,070	0,1		85	0,025	0,040	0,100								
		155	0,012	0,045	0,070	0,1		115	0,020	0,040	0,100								
		130	0,02 (2)	0,045	0,070	0,1		100	0,020	0,040	0,100								
		130	0,02 (2)	0,045	0,070	0,1		100	0,015	0,040	0,100								
		95	0,02 (2)	0,045	0,070	0,1		70	0,015	0,040	0,100								
		130	0,012	0,045	0,070	0,1		100	0,020	0,040	0,100								
		130	0,012	0,045	0,070	0,1		100	0,020	0,040	0,100								
		80	0,02 (2)	0,040	0,070	0,1		60	0,010	0,040	0,100								
		75	0,02 (2)	0,040	0,070	0,1		55	0,010	0,040	0,100								
		65	0,02 (2)	0,040	0,070	0,1		45	0,010	0,040	0,100								
		150	0,025 (3)	0,065 (2)	0,070	0,1		100	0,007	0,040	0,100								
		110	0,03 (3)	0,065 (2)	0,070	0,1		70	0,004	0,040	0,100								
		90	0,03 (3)	0,065 (2)	0,070	0,1		55	0,004	0,040	0,100								
		55	0,02 (2)	0,065 (2)	0,070	0,1		30	0,009	0,040	0,100								
		45	0,03 (3)	0,075 (3)	0,095 (2)	0,1 (2)		25	0,004	0,040	0,100								
		55	0,015 (2)	0,030	0,050	0,1		35	0,008	0,030	0,095								
		40	0,02 (4)	0,04 (2)	0,050	0,1 (2)		20	0,004	0,030	0,095								
		45	0,013 (2)	0,030	0,050	0,1		30	0,007	0,030	0,095								
	45	105	0,020	0,050	0,075	0,1	40	70	0,030	0,050	0,100	85	0,040	0,120	0,060	0,200	0,095	0,300	
	45	100	0,025 (2)	0,050	0,075	0,1	40	70	0,015	0,050	0,100	85	0,040	0,120	0,060	0,200	0,095	0,300	
	60	130	0,020	0,050	0,075	0,1	50	90	0,030	0,050	0,100	105	0,040	0,120	0,060	0,200	0,095	0,300	
	45	110	0,025 (2)	0,050	0,075	0,1	40	75	0,020	0,050	0,100	90	0,040	0,120	0,060	0,200	0,095	0,300	
	45	105	0,020	0,050	0,075	0,1	40	70	0,030	0,050	0,100	85	0,040	0,120	0,060	0,200	0,095	0,300	
	45	100	0,02 (2)	0,040	0,075	0,1	40	65	0,010	0,050	0,100	85	0,040	0,120	0,060	0,200	0,095	0,300	
	40	85	0,025 (2)	0,050	0,075	0,1	30	60	0,015	0,050	0,100	75	0,040	0,120	0,060	0,200	0,095	0,300	
		400	0,030	0,075	0,100	0,1		400	0,050	0,065	0,100	400	0,070	0,200	0,120	0,300	0,170	0,400	
		400	0,030	0,075	0,100	0,1		400	0,050	0,065	0,100	400	0,070	0,200	0,120	0,300	0,170	0,400	
		400	0,030	0,075	0,100	0,1		360	0,050	0,065	0,100	400	0,070	0,200	0,120	0,300	0,170	0,400	
		400	0,030	0,075	0,100	0,1		360	0,050	0,065	0,100	400	0,070	0,200	0,120	0,300	0,170	0,400	
		170	0,030	0,075	0,100	0,1	95	130	0,050	0,065	0,100	195	0,070	0,200	0,120	0,300	0,170	0,400	
		400	0,030	0,075	0,100	0,1		360	0,050	0,065	0,100	480	0,070	0,200	0,120	0,300	0,170	0,400	
		360	0,030	0,075	0,100	0,1		205	0,050	0,065	0,100								
		360	0,030	0,075	0,100	0,1		205	0,045	0,065	0,100								
		360	0,030	0,075	0,100	0,1		205	0,050	0,065	0,100								
		50	0,030	0,075	0,100	0,1		30	0,050	0,065	0,100								
		35	0,015 (2)	0,030	0,050	0,1		20	0,011	0,030	0,095								
		25	0,015 (2)	0,05 (2)	0,050	0,085		15	0,009	0,030	0,095								
		40	0,015 (2)	0,05 (2)	0,050	0,09		20	0,010	0,030	0,095								
		25	0,02 (3)	0,05 (2)	0,050	0,1 (2)		15	0,007	0,030	0,095								
		25	0,013 (2)	0,05 (2)	0,050	0,1 (2)		15	0,007	0,030	0,095								
		40	0,011	0,035	0,050	0,1		20	0,020	0,030	0,095								
		40	0,015 (2)	0,035	0,050	0,1		25	0,008	0,030	0,095								
		20	0,015 (2)	0,035	0,050	0,1		10	0,008	0,030	0,095								
		50	0,015 (2)	0,030	0,050	0,09		30	0,011	0,030	0,095								
		60	0,015 (2)	0,05 (2)	0,050	0,09		30	0,009	0,030	0,095								
		55	0,02 (3)	0,065 (2)	0,070	0,1		40	0,005	0,040	0,075								
		35	0,011	0,045	0,070	0,1		30	–	0,040	0,075								
		30	0,011	0,060 (3)	0,08 (3)	0,1 (3)		25	–	0,006	0,060								
		60	0,011	0,065 (2)	0,070	0,1		45	–	0,040	0,075								
		290	0,011	0,035	0,050	0,1		155	0,020	0,030	0,090								
	90	145	0,011	0,035	0,050	0,1	70	105	0,020	0,030	0,090								
	30	65	0,011	0,035	0,050	0,1	25	40	0,020	0,030	0,090								
	30	65		0,035	0,050	0,1	25	40	0,020	0,030	0,090								
	30	65		0,035	0,050	0,1	25	40	0,020	0,030	0,090								
	175	215		0,035	0,050	0,1	150	155	0,020	0,030	0,090	175	0,025	0,1	0,045	0,15	0,06	0,2	

Type description

Thread milling cutters

Type description	Machining	Materials							Helix angle	Thread depth	Page
		P	M	K	N	S	H	O			
		Steel	Stainless steel	Cast iron	NF metals	Materials with difficult cutting properties	Hard materials	Other			
TC610 	– Universal thread milling cutter 	●●	●●	●●	●●	●●		●	20°	1,5 × D _N	B 1090
TC611 	– Universal thread milling cutter 	●●	●●	●●	●●	●●		●	20°	2,0 × D _N	B 1091
TMC 	– Universal thread milling cutter with countersink 	●●	●●	●●	●●	●●		●	27°	2,0 × D _N	B 1105
TME 	– Universal thread milling cutter for external thread 	●●	●●	●●	●●	●●		●	20°	2,0 × D _N	B 1095
TMO 	– Universal orbital thread milling cutter 	●●	●●	●●	●●	●●		●	15°	2,0 × D _N 3,0 × D _N	B 1108
TMI 	– Universal indexable insert thread milling cutter 	●●	●●	●●	●●	●●		●	0°	1,0 × D _N 1,5 × D _N	B 1116
TMG HRC 	– Thread milling cutter for hardened materials from 48 to 63 HRC 	●●		●●		●	●●	●	10°	1,5 × D _N	B 1093
TMO HRC 	– Orbital thread milling cutter for hardened materials from 48 to 63 HRC 	●●		●●		●	●●	●	15°	2,0 × D _N	B 1110
TMG Ni 	– Thread milling cutter for nickel alloys 	●●	●●		●	●●		●	27°	1,5 × D _N	B 1100
TMD 	– Drill thread milling cutter for short-chipping aluminium and grey cast iron materials 			●●	●●				27°	2,0 × D _N	B 1107

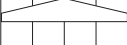
- Primary application
- Additional application

Product families

Thread milling cutters

TC610 / TC611	Universal thread milling cutter
TMC	Universal thread milling cutter with countersink
TMD	Drill thread milling cutter
TME	Universal thread milling cutter for external thread
TMG HRC	Thread milling cutter for hardened materials from 48 to 63 HRC
TMG Ni	Thread milling cutter for nickel alloys
TMI	Universal indexable insert thread milling cutter
TMO	Universal orbital thread milling cutter
TMO HRC	Orbital thread milling cutter for hardened materials from 48 to 63 HRC

Grade description

Walter grade description	Standard designation	Materials							Range of applications							Coating process	Coating composition	Tool example
		P	M	K	N	S	H	O	01	10	20	30	40	45				
		Steel	Stainless steel	Cast iron	NF metals	Materials with difficult cutting properties	Hard materials	Other										
WB10RD	HC – 10	●●	●●	●●	●●	●●		●								PVD	TiAlN + ZrN	
WJ30RC	HC – 30	●●	●●	●●	●●	●●		●								PVD	TiAlN	

HC = Coated carbide

- Primary application
- Additional application

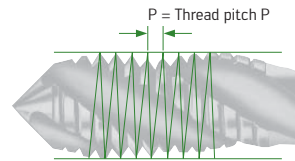
Process principles

Basic aspects of thread milling

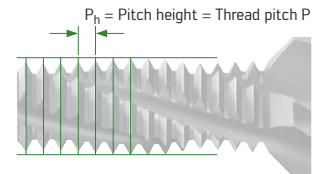
- A machine tool with a 3D CNC control system is required (largely standard today)
- Conventional thread milling is cost-effective up to approx. $2 \times D_N$, while orbital thread milling is beneficial for larger thread depths
- For larger thread dimensions, thread milling is generally quicker than tapping and thread forming

In contrast to tapping and thread forming, the pitch is created by the CNC control system when carrying out thread milling.

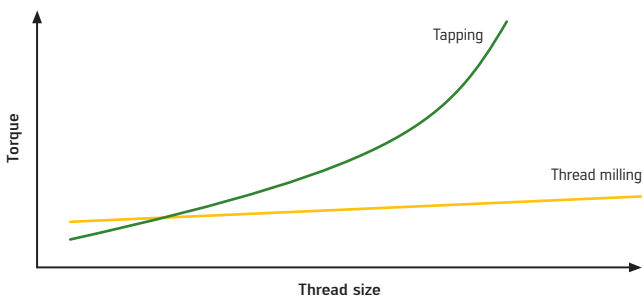
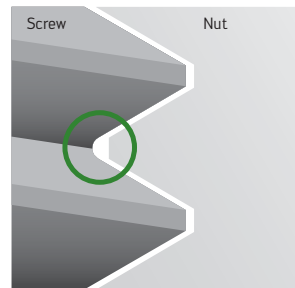
Theoretically, an internal thread milling cutter can also be used to create an external thread. However, because the external threads are rounded to minimise the notch effect in the core and the outer diameter created is too small, the threads created in this way will not comply with the thread standard. The gauge accuracy will nevertheless be maintained, as the thread ring gauge tests the pitch diameter.



Tapping: The thread pitch P is created by the tap/thread former.



Thread milling: The thread pitch P is created by the CNC control system (circular program).



It is also possible to create large threads on machines with lower drive power, as, in contrast to tapping and thread forming, the torque required for thread milling only increases moderately as the thread size increases.

Thread milling is an extremely reliable production process. Chip removal is generally unproblematic, as the process produces short chips. In addition, thread milling does not require any special chucks; almost all common milling chucks can be used for thread milling as well.

The laws of physics mean that thread milling cutters are subject to less deflection at the shank than at the front cutting edge. As shown in the adjacent curve formula, this leads to conical threads when using conventional thread milling cutters.

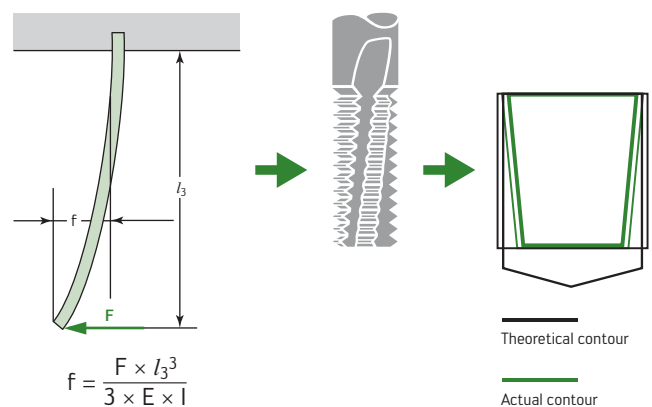
In order to counteract this physical law, the geometric design of thread milling cutters is slightly conical. Problems with this resulting from difficult machining conditions (e.g. deep threads) can be remedied via one of the following measures:

- (Multiple) radial cutting pass(es)
- Using conventional milling for all radial cuts
- Carrying out a non-cutting pass without additional feed at the end of the process (radial cutting passes are preferable to carrying out a non-cutting pass due to their wear behaviour)

Note:

Orbital thread milling cutters (TMO) are a good alternative, as they can be used to create parallel threads right to the bottom of the hole. With orbital thread milling cutters, the relevant projection length for the curvature does not change across the entire length of the thread, as only one row of cutting edges is engaged at any given time. This means that the curvature remains constant.

The measures listed above increase the cycle time, but are unavoidable in some cases where it is not otherwise possible to ensure that the thread remains true to gauge. Measures for reducing the conicity must often be implemented in particular for threads with tight tolerances and when working with materials with difficult cutting properties (such as Inconel).



f = Curvature
 F = Cutting force
 l_3 = Projection length

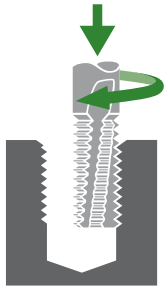
E = Modulus of elasticity
 I = Grade 2 surface torque
 l_c = Cutting edge length

Machining strategies

Thread milling processes

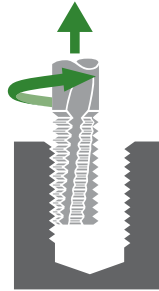
There are two fundamentally different thread milling processes:

Conventional milling



Conventional milling is preferred when machining hardened materials, or as a remedy for conical threads.
(from top to bottom in right-hand threads)

Synchronous milling



Synchronous milling increases tool life and prevents chatter marks, while facilitating thread conicity.
(from bottom to the top in right-hand threads)

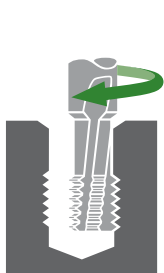
Note:

Walter GPS automatically determines the right process for the relevant application and takes into account the specific details relating to the tool and the machining process.

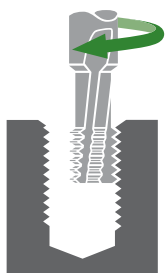
Cutting pass

The cuts can be made in a number of passes in order to reduce the forces acting on the tool:

Axial passes



First cut



Second cut

Note:

Ensure that the thread milling cutter is always moved by a multiple of the pitch when making axial cutting passes.

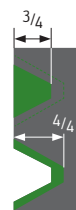
Radial passes



First cut



Second cut



First cut
Conventional milling

Second cut
Synchronous milling

Advantages:

- Greater thread depths can be created
- Reduced risk of tool breakage
- Thread milling is possible even with a relatively unstable clamping arrangement
- Counteracts conical threads

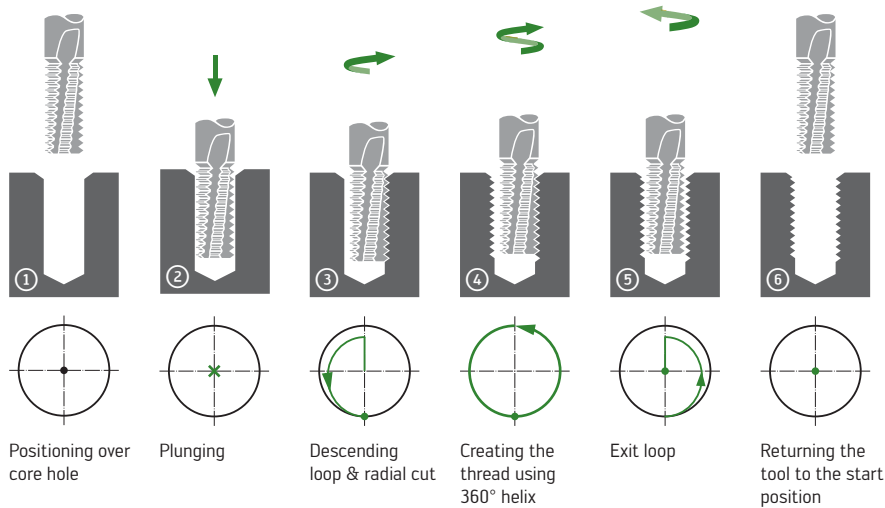
Disadvantages:

- Increased tool wear
- Higher production time
- Axial passes can result in burr at the transition

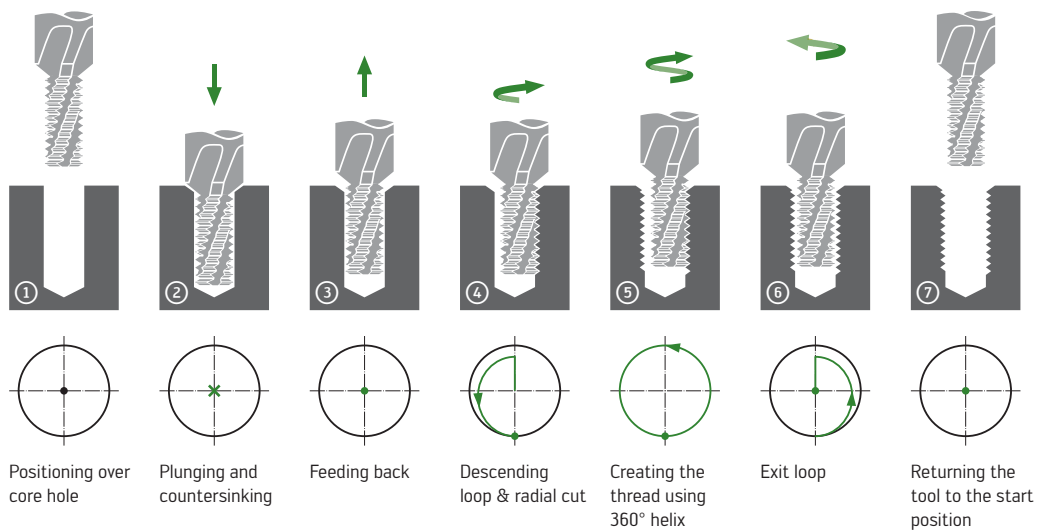
Machining strategies

Basic strategies

Thread milling



Thread milling with countersink

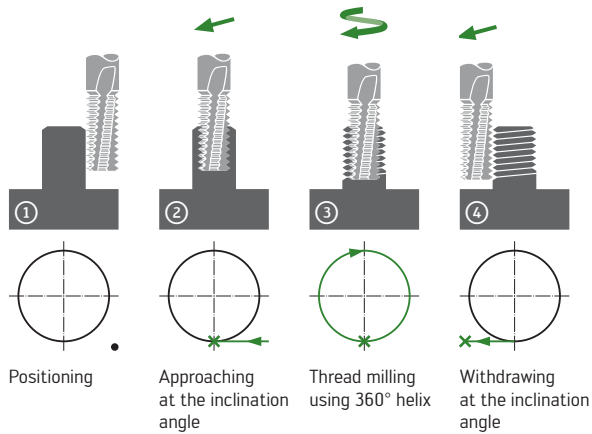


- Start position
- Movement out of the level
- ✕ Movement into the level
- Direction of movement on the x-axis and y-axis

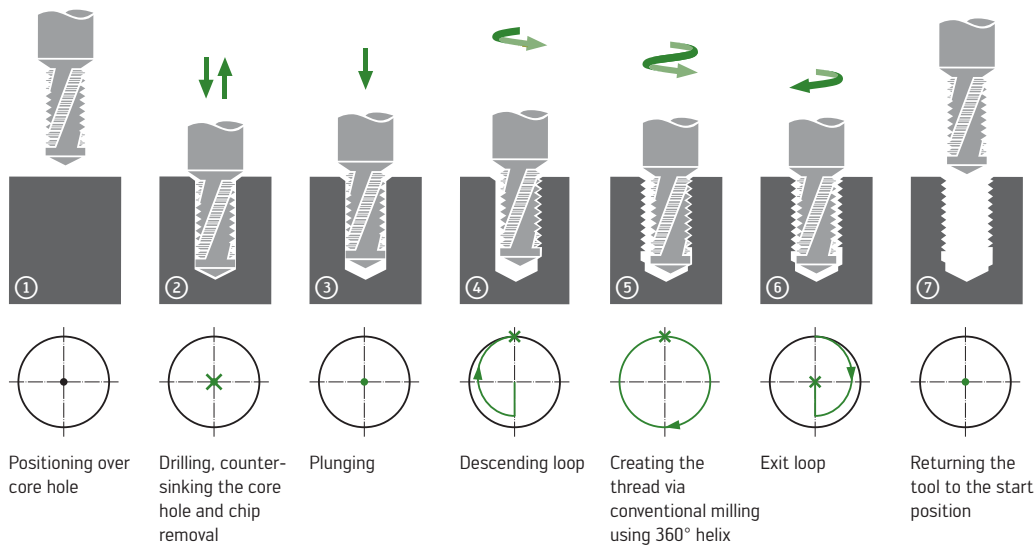
Machining strategies

Basic strategies (continued)

External thread milling

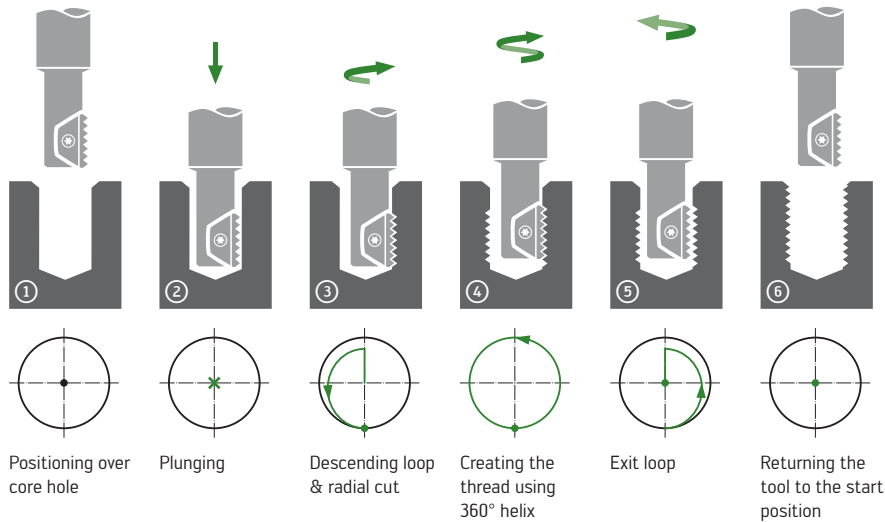


Drilling and thread milling



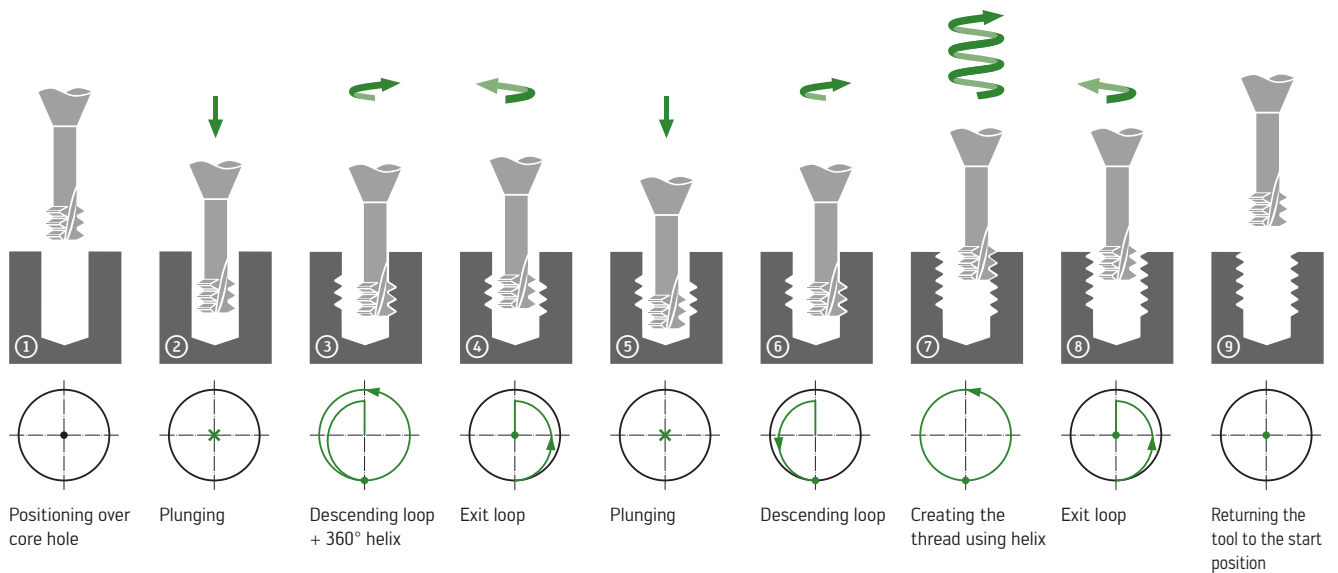
- Start position
- Movement out of the level
- ✕ Movement into the level
- Direction of movement on the x-axis and y-axis

Indexable insert thread milling



Steps 2-5 are repeated until the thread depth is achieved.

Orbital thread milling

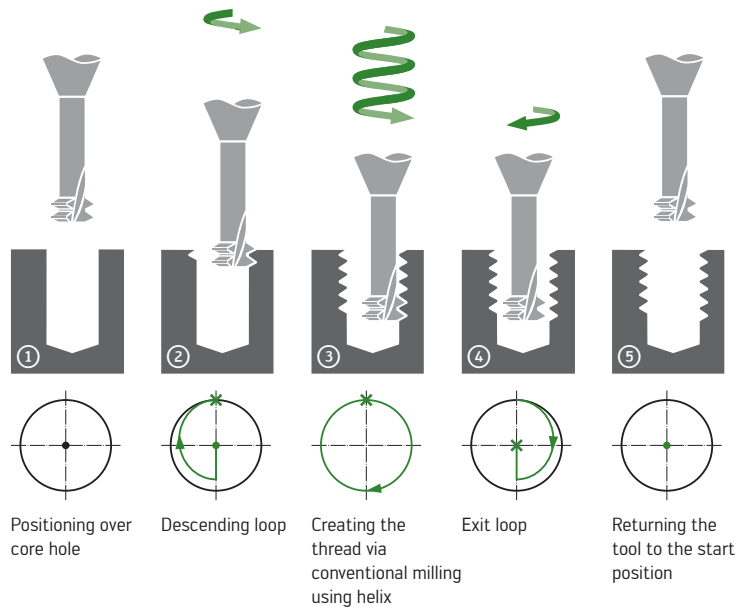


- Start position
- Movement out of the level
- ✕ Movement into the level
- ➔ Direction of movement on the x-axis and y-axis

Machining strategies

Basic strategies (continued)

Orbital thread milling in hardened materials



CNC programming

It is generally recommended to use Walter GPS to generate the CNC program for thread milling. Unlike predefined machine cycles, Walter GPS takes into account the stability of the tool and the material to be machined. On the basis of this information, it automatically selects the optimum cutting parameters and includes radial cutting passes in the program sequence if necessary. CNC programs can normally be generated for all commonly used control systems. Every line of the program includes comments, enabling users to understand the program sequence and to adjust individual values, which is not possible with machine cycles. In addition, using Walter GPS enables the required thread tolerance to be achieved with the very first thread – eliminating the need to carry out time-consuming gradual adjustment to achieve suitable correction values.

Every thread milling cutter is measured during production and labelled with the programming radius ("Rprg."). The programming radius is calculated on the basis of the actual pitch diameter measured. As the thread is gauged on the pitch diameter, it is vital that this is taken into account in the programming. Not all users are able to measure the pitch diameter of a thread milling cutter and calculate the Rprg. The labelling of the tools with the Rprg. as standard therefore offers significant advantages for ensuring optimum processes, as users can simply read the Rprg. on the shank of the tool and input it directly into the tool memory of the machine. If the Rprg. is entered without correction, the thread milling cutter will move along the path of the smallest permitted pitch diameter.

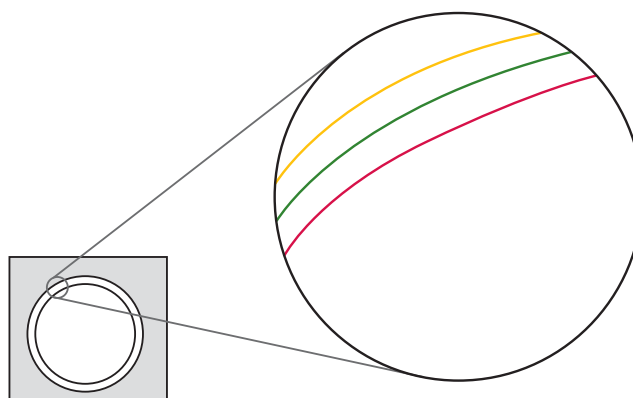
As using the Rprg. by itself only results in the use of the minimum permitted pitch diameter, the value entered must be corrected on the basis of the selected tolerance. The top line of the CNC program generated by Walter GPS can be used to do so. Reducing the Rprg. by the specified correction value (in the adjacent example, this is 0.038 mm) results in a movement sequence in which the pitch diameter of the milled thread is situated in the middle of the tolerance range.

If the tool becomes worn during machining, the deflection increases and the pitch diameter is reduced. This can be offset by correcting the Rprg. It is recommended to use correction increments of 0.01 mm.

Note: If the tool memory uses diameters instead of radii, the Rprg. must be doubled before it is entered. Failing to do so will result in a collision, breaking the tool.



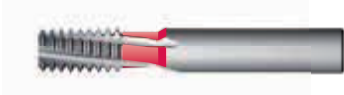
Comment	Code
Tool radius presetting	;Tol. 6H: R='Rprg'-0.038 mm
Tool request	N01 M6 T
Selection of working plane	N02 G90 G17



- Maximum permitted pitch diameter
- Middle of the tolerance range
(achieved using the correction value calculated by Walter GPS.)
- Minimum permitted pitch diameter
(achieved if the Rprg. is entered without correction.)

Modifications

Thread milling cutters

	Modification	Effect
	Countersink and facing step	Countersinking and facing step in one tool
	Coolant grooves on the shank	Targeted cooling without weakening the tool cross section in the cutting area
	Radial coolant outlets	Targeted cooling for through-hole threads
	Threads removed	Reduced cutting forces, as fewer teeth are engaged at once. Increased machining time, as several passes are necessary.
	Deburring cutting edge	Removal of the incomplete thread at the thread start area without an additional operation
	First thread profile lengthened on the face	Chamfering of the core hole
	Grinding of the neck	Enables axial cutting passes to be made (useful for deep threads)

Solutions

		Thread milling problems					
		Chatter marks	Low tool life	Cutting edges chipping	Conical threads*	Tool breakage	Gauge accuracy
Cutting data/strategy/settings	f_z in [mm/tooth]	+	+	☐	-	-	
	v_c in [m/min]	-	-	☐		☐	
	Programming			☐		☐	☐
	Synchronous milling	■	■				
	Conventional milling				■		■
	Cutting pass	■		■	■	■	■
	Programming radius [Rprg.]						☐
	Cooling		+	+			
Workpiece	Clamping arrangement	☐	+	+	☐	☐	☐
	Pilot hole diameter	☐	+	☐	☐	☐	+
	Chip removal		+	+	☐	☐	
Tool	Stability/geometry	☐	+	+	☐	☐	+
	Projection length	-	-	-	-	-	-
	Coating		☐				
	Concentricity	☐	☐	☐		☐	☐

☐ check ☒ preferably use - reduce + improve/increase

* Using tools in the TMO family is an excellent alternative for creating parallel threads.

TMO – Specialists for demanding tasks:

Tools in the TMO family are often used as problem-solvers where

- deep threads need to be created
- hardened materials are to be machined
- conventional thread milling cutters create conical threads

Cooling and lubrication:

Problems caused due to cooling and lubrication and the corresponding measures for remedying these problems are located in the “Cooling and lubrication” section.

Hard machining:

- Only use tools specially designed for hard machining (TMO HRC or TMG HRC)
- Carry out machining using conventional milling where possible (see Walter GPS recommendation)
- Select the largest permitted pilot hole diameter
- If problems with the cylindricity of threads occur, carry out several radial cuts or use tools from the TMO HRC family
- Do not use cooling lubricant. Instead, remove the hard chips from the drilled hole by blasting with air or using minimum quantity lubrication

Shank dimensions in accordance with DIN 6535

Parallel shank DIN 6535 HA

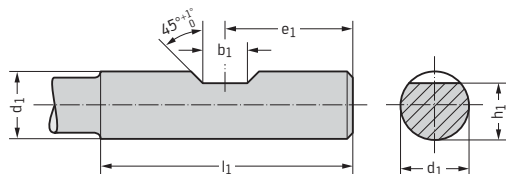
Form HA
for $d_1 = 2-32$ mm



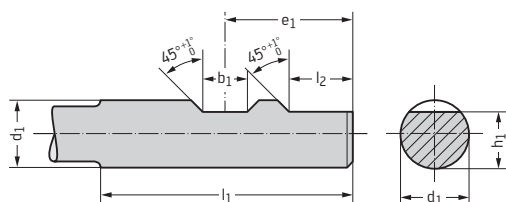
d_1 h6 [mm]	2	6	10	12	16	20	25	32
l_1 +2 [mm]	28	36	40	45	48	50	56	60

Parallel shank DIN 6535 HB

Form HB
with a clamping face for $d_1 = 6-20$ mm



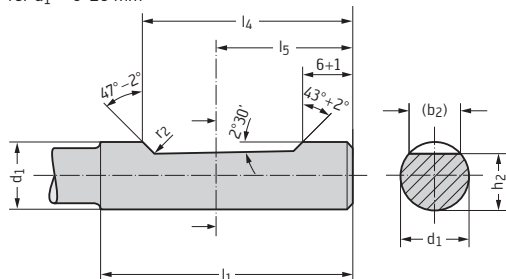
Form HB
with two clamping faces for $d_1 = 25$ and 32 mm



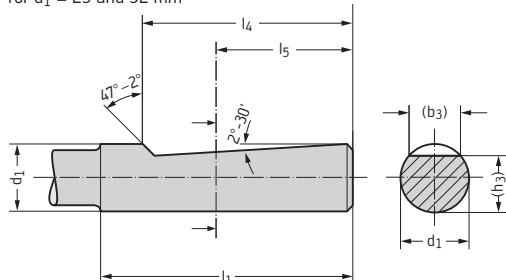
d_1 h6 [mm]	b_1 +0,05 [mm]	e_1 -1 [mm]	h_1 h11 [mm]	l_1 +2 [mm]	l_2 +1 [mm]
6	4,2	18	5,1	36	–
8	5,5	18	6,9	36	–
10	7	20	8,5	40	–
12	8	22,5	10,4	45	–
14	8	22,5	12,7	45	–
16	10	24	14,2	48	–
18	10	24	16,2	48	–
20	11	25	18,2	50	–
25	12	32	23,0	56	17
32	14	38	30,0	60	19

Parallel shank DIN 6535 HE

Form HE
for $d_1 = 6-20$ mm



Form HE
for $d_1 = 25$ and 32 mm



d_1 h6 [mm]	(b_2) ≈ [mm]	(b_3) [mm]	h_2 h11 [mm]	(h_3) [mm]	l_1 +2 [mm]	l_4 -1 [mm]	l_5 Nominal dimension [mm]	r_2 min. [mm]
6	4,3	–	5,1	–	36	25	18	1,2
8	5,5	–	6,9	–	36	25	18	1,2
10	7,1	–	8,5	–	40	28	20	1,2
12	8,2	–	10,4	–	45	33	22,5	1,2
14	8,1	–	12,7	–	45	33	22,5	1,2
16	10,1	–	14,2	–	48	36	24	1,6
18	10,8	–	16,2	–	48	36	24	1,6
20	11,4	–	18,2	–	50	38	25	1,6
25	13,6	9,3	23,0	24,1	56	44	32	1,6
32	15,5	9,9	30,0	31,2	60	48	35	1,6

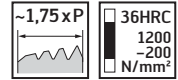
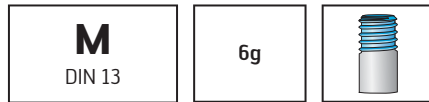
HSS(-E) threading dies	M	B 1136
	MF	B 1138
	UNC	B 1139
	UNF	B 1140
	G	B 1141

HSS threading dies

Protocut®



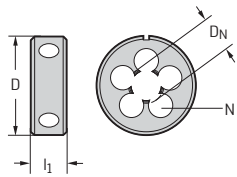
– For long-chipping and short-chipping materials



	P	M	K	N	S	H	O
Uncoated	●●			●●			

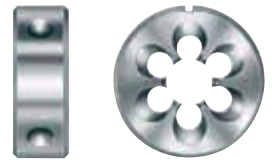
EN 22568						
Designation Uncoated	D _N	P mm	D f10 mm	l ₁ mm	N	
60000-M1	M 1	0,25	16	5	3	
60000-M1.2	M 1.2	0,25	16	5	3	
60000-M1.4	M 1.4	0,3	16	5	3	
60000-M1.6	M 1.6	0,35	16	5	3	
60000-M2	M 2	0,4	16	5	3	
60000-M2.5	M 2.5	0,45	16	5	3	
60000-M3	M 3	0,5	20	5	3	
60000-M4	M 4	0,7	20	5	3	
60000-M5	M 5	0,8	20	7	4	
60000-M6	M 6	1	20	7	4	
60000-M8	M 8	1,25	25	9	4	
60000-M10	M 10	1,5	30	11	4	
60000-M12	M 12	1,75	38	14	4	
60000-M14	M 14	2	38	14	5	
60000-M16	M 16	2	45	18	5	
60000-M20	M 20	2,5	45	18	5	
60000-M24	M 24	3	55	22	5	
60000-M30	M 30	3,5	65	25	6	

≤ M 1.4: 6h, ≥ M 1.6: 6g

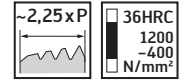
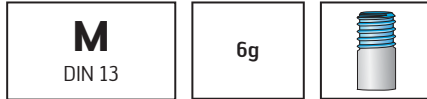


HSS-E threading dies

Protocut® Inox

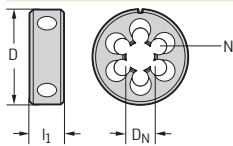


– For long-chipping materials

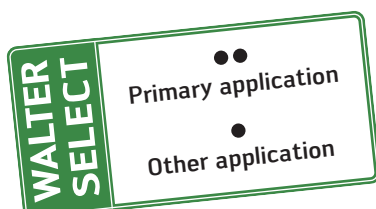


	P	M	K	N	S	H	O
Uncoated	●●	●●					

EN 22568



Designation Uncoated	D _N	P mm	D f10 mm	l ₁ mm	N
60003-M2	M 2	0,4	16	5	4
60003-M2.5	M 2.5	0,45	16	5	4
60003-M3	M 3	0,5	20	5	4
60003-M3.5	M 3.5	0,6	20	5	4
60003-M4	M 4	0,7	20	5	4
60003-M5	M 5	0,8	20	7	4
60003-M6	M 6	1	20	7	4
60003-M7	M 7	1	25	9	4
60003-M8	M 8	1,25	25	9	5
60003-M10	M 10	1,5	30	11	5
60003-M12	M 12	1,75	38	14	5
60003-M14	M 14	2	38	14	5
60003-M16	M 16	2	45	18	5
60003-M18	M 18	2,5	45	18	5
60003-M20	M 20	2,5	45	18	5

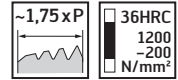
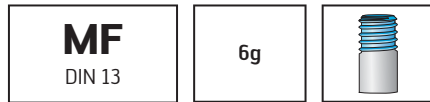


HSS threading dies

Protocut®

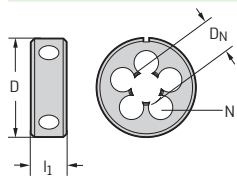


– For long-chipping and short-chipping materials



	P	M	K	N	S	H	O
Uncoated	●●			●●			

EN 22568



Designation Uncoated	D _N	P mm	D f10 mm	l ₁ mm	N
61000-M5X0.5	M 5	0,5	20	5	4
61000-M6X0.5	M 6	0,5	20	5	4
61000-M6X0.75	M 6	0,75	20	7	4
61000-M8X0.75	M 8	0,75	25	9	5
61000-M8X1	M 8	1	25	9	5
61000-M10X1	M 10	1	30	11	5
61000-M12X1	M 12	1	38	10	5
61000-M14X1	M 14	1	38	10	5
61000-M16X1	M 16	1	45	14	5
61000-M18X1	M 18	1	45	14	5
61000-M20X1	M 20	1	45	14	6
61000-M10X1.25	M 10	1,25	30	11	5
61000-M12X1.25	M 12	1,25	38	10	5
61000-M12X1.5	M 12	1,5	38	10	4
61000-M14X1.5	M 14	1,5	38	10	5
61000-M16X1.5	M 16	1,5	45	14	5
61000-M18X1.5	M 18	1,5	45	14	5
61000-M20X1.5	M 20	1,5	45	14	6
61000-M22X1.5	M 22	1,5	55	16	5
61000-M24X1.5	M 24	1,5	55	16	6
61000-M30X1.5	M 30	1,5	65	18	6

HSS threading dies
Protocut®



– For long-chipping and short-chipping materials

UNC
ASME B1.1

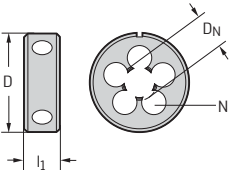
2A



 ~1,75 x P

 36HRC
1200
~200
N/mm²

	P	M	K	N	S	H	O
Uncoated	●●			●●			

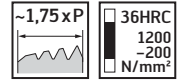
EN 22568		Designation Uncoated	D _N -P Nom	D _N mm	D f10 mm	l ₁ mm	N
	62000-UNC2	UNC 2-56		2,184	16	5	4
	62000-UNC4	UNC 4-40		2,845	16	5	4
	62000-UNC6	UNC 6-32		3,505	20	7	4
	62000-UNC8	UNC 8-32		4,166	20	7	4
	62000-UNC1/4	UNC 1/4-20		6,35	20	7	4
	62000-UNC5/16	UNC 5/16-18		7,938	25	9	4
	62000-UNC3/8	UNC 3/8-16		9,525	30	11	4
	62000-UNC7/16	UNC 7/16-14		11,113	30	11	4
	62000-UNC1/2	UNC 1/2-13		12,7	38	14	4
	62000-UNC9/16	UNC 9/16-12		14,288	38	14	4
	62000-UNC5/8	UNC 5/8-11		15,875	45	18	4
	62000-UNC3/4	UNC 3/4-10		19,05	45	18	5
	62000-UNC1X8	UNC 1"-8		25,4	55	22	5

HSS threading dies

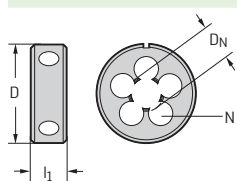
Protocut®



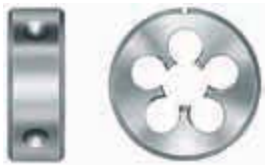
– For long-chipping and short-chipping materials



	P	M	K	N	S	H	O
Uncoated	●●			●●			

EN 22568						
Designation Uncoated		D _N -P Nom	D _N mm	D f10 mm	l ₁ mm	N
		63000-UNF10	UNF 10-32	4,826	20	4
		63000-UNF1/4	UNF 1/4-28	6,35	20	4
		63000-UNF5/16	UNF 5/16-24	7,938	25	4
		63000-UNF3/8	UNF 3/8-24	9,525	30	4
		63000-UNF7/16	UNF 7/16-20	11,113	30	5
		63000-UNF1/2	UNF 1/2-20	12,7	38	5
		63000-UNF9/16	UNF 9/16-18	14,288	38	5
		63000-UNF5/8	UNF 5/8-18	15,875	45	5
		63000-UNF3/4	UNF 3/4-16	19,05	45	6
		63000-UNF7/8	UNF 7/8-14	22,225	55	5

HSS threading dies
Protocut®



– For long-chipping and short-chipping materials

G
DIN EN ISO 228

Class A

~1,75 x P

36HRC
1200
~200
N/mm²

	P	M	K	N	S	H	O
Uncoated	●●			●●			

EN 24231							
Designation Uncoated		D _N Nom	D _N mm	Threads per inch	D f10 mm	l ₁ mm	N
64000-G1/8		G 1/8-28	9,728	28	30	11	5
64000-G1/4		G 1/4-19	13,157	19	38	10	5
64000-G3/8		G 3/8-19	16,662	19	45	14	5
64000-G1/2		G 1/2-14	20,955	14	45	14	6
64000-G3/4		G 3/4-14	26,441	14	55	16	6
64000-G1		G 1"-11	33,249	11	65	18	7



Coatings and surface treatments	B 1144
Cooling and lubrication	B 1146
Information on the core hole	B 1150
Thread – Pilot hole diameter	B 1151
Thread types in accordance with DIN	B 1162
Tolerance units	B 1170
Calculation formulae – Thread machining	B 1172
Cutting forces of Walter machining groups	B 1173
Material comparison table	B 1174
Hardness comparison table	B 1196
ISO tolerances	B 1197

Coatings and surface treatments

Surface treatment and hard material coatings for increased performance

Surface coating has developed into a proven technological process for improving the performance of metal cutting tools. In contrast to surface treatment, the tool surface remains chemically unaltered and a thin layer is applied.

For Walter Prototyp high-speed steel and carbide tools, the coating is applied using PVD processes, which work at process temperatures of below 600 °C and therefore do not result in any change to the base material. Hard material layers have a greater hardness and wear resistance than the substrate itself.

In addition

- they separate the substrate and the material to be cut from each other
- they act as a thermal insulation layer

Note:

This also means that coated tools have a longer tool life – even at higher cutting speeds.

Tapping/thread forming

Surface treatment/ coating	Areas of use	Properties	Tool example
Uncoated	– Very deep blind holes in soft steels – Used if there are problems with chip removal	– Lower v_c/tool life quantity compared to coated tools – Tightly rolled chips	
NIT	– Grey cast iron (GJL) materials – AlSi alloys with a content of 6-18% – Ampco	– Improved wear resistance thanks to increased surface hardness – Reduced toughness	
VAP	– Primarily for stainless materials – In materials that are soft, tough or have a tendency towards weld formations – For very deep blind hole threads	– Improved cooling lubricant adhesion resulting in reduced weld formations – Lower v_c/tool life quantity compared to coated tools – Improved chip removal	
NID (NIT + VAP)	– Through hole: Steel up to 1200 N/mm², cast iron and aluminium machining – Blind hole: Short-chipping materials only (grey cast iron (GJL), AlSi alloys with > 7% silicon content, C70); steels with high pearlite content – Not for stainless materials that tend to cause jamming	– Longer tool life thanks to increased surface hardness – Reduced toughness – Nidamised means nitrided and vaporised	
TiN	– Low-alloy steels – Stainless materials – Suitable for Ni alloys	– Universal coating – Suitable for many materials – Not for Ti alloys	
TiN / VAP	– Very deep blind holes – Steels in general	– Better chip formation compared to fully TiN-coated tools	

Tapping/thread forming

Surface treatment/ coating	Areas of use	Properties	Tool example
TiCN	– Alloyed and unalloyed steels – Abrasive materials such as grey cast iron, AlSi alloys (> 5% silicon content), copper alloys and bronze alloys – Suitable for Ni alloys	– Resistant to wear when machining abrasive materials – Highly suited to solid carbide tools – Not for Ti alloys	
THL	– Steels in general and stainless steels in particular – Deep blind holes – MQL machining	– Better chip formation than TiN and TiCN – Tends to cause weld formations in materials containing manganese	
CrN	– Tapping in aluminium and copper alloys – Thread forming in Ti alloys – Machining lubricating steels	– Reduces weld formations	
TAFT	– Stainless steels – ISO K materials	– Good chip formation – Reduces weld formations	
ACN	– Ti alloys – Ni alloys	– No affinity for Ti alloys, because it is a titanium-free layer	

Thread milling

Surface treatment/ coating	Areas of use	Properties	Tool example
Uncoated	– For use in aluminium and Ti alloys	– Sharp cutting edges	
TiCN	– Universal use up to 48 HRC	– Good performance in many materials	
TAX	– For hardened and abrasive materials	– Higher temperature resistance than TiCN	
NHC	– ISO N materials	– High temperature resistance – Reduced tendency towards adhesion – Resistant to abrasive wear – High layer hardness – Sharp cutting edges	

Cooling and lubrication

It is common to talk about "coolant" in this context, although for thread cutting and thread forming in particular, lubrication is more important than cooling. The following different methods are used:

- External coolant supply
- External coolant supply via outlets parallel to the axis on the chuck
- "Internal" coolant supply via flutes on the shank
- Internal coolant supply (= IC) with axial coolant outlet (= AC)
- Internal coolant supply with radial coolant outlet (= RC)

External coolant supply is the most widely used method. It works in most cases. When machining blind hole threads vertically, the core hole fills with coolant (with the exception of very small drill diameters) and this facilitates the thread machining process.

When producing through-hole threads, the core hole is unable to be filled, however, because the chips are transported in the direction of feed and no chips are created in the first place during thread forming. The coolant may still be able to penetrate right to the chamfer/lead even in deep threads. The coolant jet should be set as parallel as possible to the tool axis.

External coolant supply becomes difficult when machining deep threads with the spindle in a horizontal position, as the coolant is not always able to penetrate through to the cutting edge. During blind hole tapping, the removal of chips also hinders the coolant supply.

Supplying coolant parallel to the axis via cooling grooves on the shank boasts significant advantages, as the coolant is always reliably supplied to the cutting edge, regardless of the tool length. The only thing that should be borne in mind with this method is that the coolant will be ejected radially as the speed increases if the coolant pressure is too low.

The internal coolant supply ensures that the coolant is continuously supplied to the cutting edge, ensuring optimum cooling and lubrication of the cutting edge at all times. It also assists with chip evacuation where necessary.

Material groups	Material	Thread cutting	Thread forming	Thread milling
P	Steel	Emulsion 5%	Emulsion 5–10%	Emulsion/MQL/air blast
	Steel 850–1200 N/mm ²	Emulsion 5–10%	Emulsion 10% or oil (Protofluid)	Emulsion/MQL/air blast
	Steel 1200–1400 N/mm ²	Emulsion 10% or oil (Protofluid)	Emulsion 10% or oil (Protofluid or Hardcut 525)	Emulsion/MQL/air blast
	Steel 1400–1600 N/mm ² Equivalent to 44–49 HRC	Oil (Protofluid or Hardcut 525)	Forming is generally not possible	Emulsion/MQL/air blast
M	Stainless steel	Emulsion 5-10% or oil (Protofluid)	Oil (Protofluid) [Emulsion 5-10% only possible with special tools, e.g. Protodyn® S Eco stainless steel]	Emulsion
K	GJL grey cast iron	Emulsion 5%	Forming is not possible	Emulsion/MQL/air blast
	GJS ductile cast iron (GGG)	Emulsion 5%	Emulsion 10%	Emulsion/MQL/air blast
N	Aluminium up to max. 12% Si	Emulsion 5–10%	Emulsion 5–15%	Emulsion/MQL/air blast
	Aluminium over 12% Si	Emulsion 5–10%	Emulsion 5-10% Forming only practical in exceptional cases	Emulsion/MQL/air blast
	Magnesium	Oil (Protofluid)	Forming is not possible at room temperature	Dry
	Copper	Emulsion 5–10%	Emulsion 5–10%	Emulsion/MQL/air blast
S	Titanium alloys	Emulsion 10% or oil (Protofluid or Hardcut 525)	Oil (Hardcut 525)	Emulsion
	Nickel alloys	Emulsion 10% or oil (Protofluid or Hardcut 525)	Oil (Protofluid or Hardcut 525)	Emulsion
H	Steel > 49 HRC	Oil (Hardcut 525) possible only with carbide tools	Forming is not possible	Dry/MQL
O	Plastics	Emulsion 5%	Forming does not produce dimensionally accurate threads	Emulsion/MQL

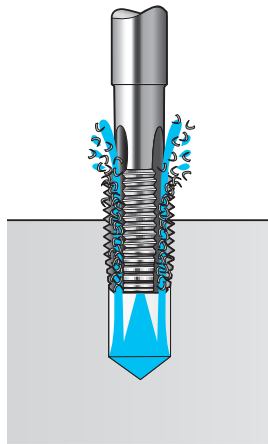
Tapping

Short chips

The best results in terms of performance and process reliability are attained if the chips can be broken short. These short chips can then be easily flushed out of the thread by the coolant. The best way to break the chips short is with straight-fluted taps (e.g. Paradur® HT). Internal cooling with an axial outlet is recommended for blind hole threads.

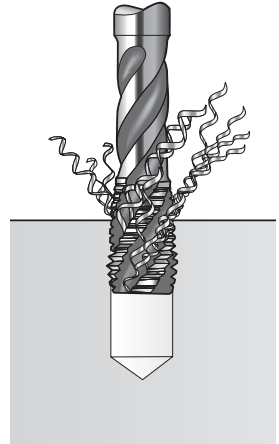
Note:

When creating blind hole threads in short-chipping materials without internal coolant, the chips collect at the bottom of the hole. If the safety margin has been measured too tight, the tool runs up against the chips and may break.



Long chips (chips cannot be broken)

When working with steels below 1000 N/mm² or with stainless steels and other extremely tough materials, it is generally not possible to break the chips short. In these cases, the chips must be removed using helical tools. If internal coolant is available, the coolant only helps with chip evacuation. In some cases, taps with a shallower helix can be used, which increases the tool life.



Cooling and lubrication

(continued)

Thread forming

Cooling and, in particular, lubrication are of central importance for thread forming. Insufficient lubrication causes a sharp drop in the surface quality of the thread, as these photographs show:



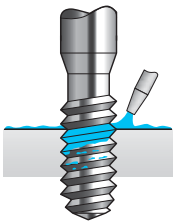
Flaky surface due to insufficient lubrication;
Remedy: Lubrication grooves



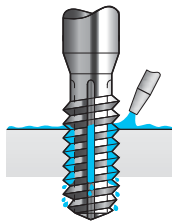
Smooth surface due to excellent lubrication

There are two different basic tool types:

Thread formers with lubrication grooves and **thread formers without lubrication grooves**. The different ranges of applications are explained below.



Without lubrication grooves



With lubrication grooves

The area of application for tools without lubrication grooves is limited to:

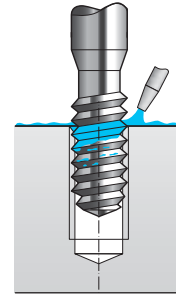
- Sheet metal extrusions
- Through-hole threads up to $1.5 \times D_N$ (because coolant cannot collect in the core hole)
- Blind hole threads when machining vertically (internal coolant is recommended for extremely deep blind hole threads)

Lubrication grooves ensure uniform lubrication even at the bottom of deep threads, which is why thread formers with lubrication grooves can be used universally. Vertical through-hole threads up to approx. $3.5 \times D_N$ can be created with lubrication grooves even without internal coolant.

There are four different cases to consider for the tool design:

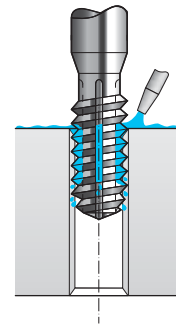
Vertical blind hole machining

Lubrication grooves and internal coolant supply are not required; external coolant supply is sufficient (internal cooling is recommended for very deep threads, though an axial coolant outlet is sufficient).



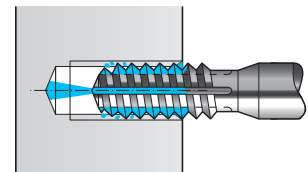
Vertical through hole machining ($> 1.5 \times D_N$)

Lubrication grooves are required; internal coolant supply is not necessary. Cooling lubricant supplied externally can penetrate through to the shaped edges via the lubrication grooves (for extremely deep threads, internal cooling with radial outlet is recommended).



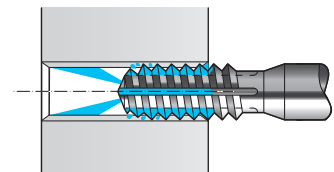
Horizontal blind hole machining

Lubrication grooves and internal coolant supply are necessary. Axial coolant outlet is sufficient.



Horizontal through hole machining

Lubrication grooves are required. Internal coolant supply with radial outlet is recommended.



Thread milling

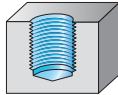
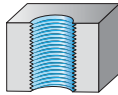
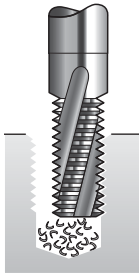
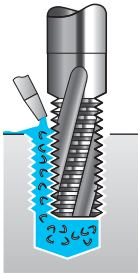
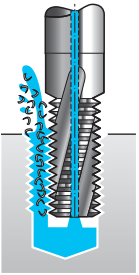
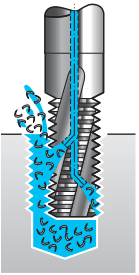
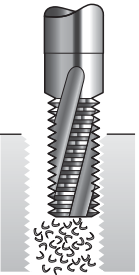
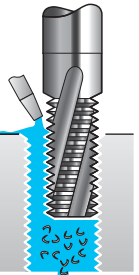
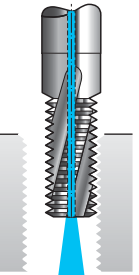
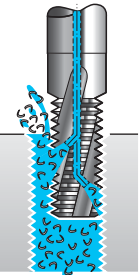
Wet machining is generally recommended for **thread milling**, however it should only be used if evenly distributed coolant can be guaranteed, as otherwise thermal shocks could occur, encouraging the formation of microcracks, which in turn result in fractures and thereby reduce the tool life.

For blind hole machining, it is generally recommended to use a tool with axial coolant outlet. In this case, the best option is to use emulsion. No thermal shocks occur, because the tool is completely submerged. In addition, the coolant jet facilitates chip removal and therefore ensures that the process is reliable. Alternatively, internally supplied compressed air or MQL can also be used here, but this results in a shorter tool life. Using externally supplied emulsion is not recommended when creating blind hole threads, as doing so can cause chips to collect in the core hole, which negatively affects the tool life. Externally supplied cooling lubricant also results in an increased risk of thermal shocks.

For creating through hole threads, it is recommended to use emulsion or MQL, supplied externally. Alternatively, compressed air can be used. Wet machining may lead to problems in some circumstances, as it is not always possible to guarantee evenly distributed cooling of the tool with external coolant supply. With smaller thread dimensions in particular, there is the risk that externally supplied coolant may not completely penetrate the small diameter pilot hole. This means that evenly distributed cooling of the tool is not ensured, leading to an increased risk of thermal shocks.

Note:

When carrying out thread milling, having no cooling is less of a problem than having intermittent cooling.

								
Machining	Dry	External	AC ¹	RC ²	Dry	External	AC ¹	RC ²
Recommendation	–	•	••	•	••	••	–	••
Illustration								
Reasoning	Chips remain in the drilled hole and could cause fracture	Chips partially remain in the drilled hole	Chips are optimally flushed out	Chips are partially flushed out	Chips fall downwards out of the drilled hole	Chips are flushed out downwards	No cooling effect	Chips are flushed out

- Primary application
- Additional application

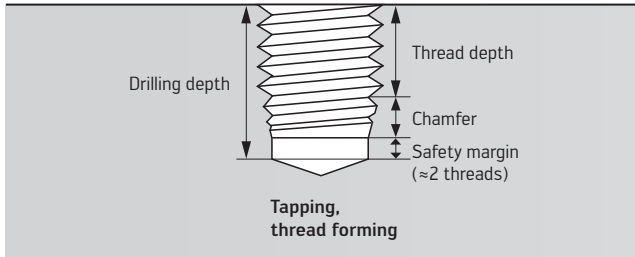
¹ Internal coolant supply with axial outlet

² Internal coolant supply with radial outlets

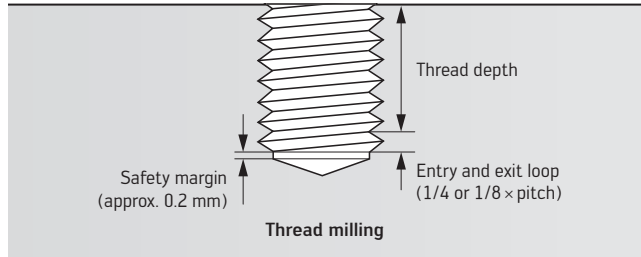
Information on the core hole and pilot hole diameter

Depth of the core hole for tapping, thread forming and thread milling

Drilling depth $\geq$ useable thread depth (+ chamfer length) + safety margin



Please note: Any existing tip on the threading tool must be taken into account when calculating the required depth of the core hole. In doing so, it is important to make a distinction between a full point and a reduced point.



Unlike taps and thread formers, thread milling cutters do not have a chamfer/lead area or a tip – the drilled depth can be used as effectively as possible. This means that they only require a very small axial safety margin.

Diameter of the core hole for tapping and thread milling

Rule of thumb: Hole diameter = nominal diameter – pitch

Example: M10 dimensions
Hole diameter $\rightarrow 10.0 \text{ mm} - 1.5 \text{ mm} = 8.5 \text{ mm}$

Pilot hole diameter for thread forming

Rule of thumb: Hole diameter = nominal diameter – $f \times \text{pitch}$

* 6H tolerance: $f = 0.45$;
6G tolerance: $f = 0.42$

Example: M10 dimensions
Hole diameter $\rightarrow 10.0 \text{ mm} - 0.45 \times 1.5 \text{ mm} = 9.325 \text{ mm} = 9.33 \text{ mm}$

Specific information on the core hole in thread forming

Note:
The recommended pilot hole diameter is marked on the shank of Walter Prototyp thread formers.

When selecting the drilling and reaming tool, the permissible tolerances for the pilot hole diameter listed in the adjacent table must be taken into account in order to ensure a reliable forming process and an adequate tool life.

Due to these tolerances, which are tighter than the tolerances for tapping, thread forming is not always more cost-effective than tapping.

In thread forming, the core diameter of the thread is created during the forming process. It is therefore dependent on the flow characteristics of the material. In contrast to this, the core diameter for tapping and thread milling is already determined by the core hole. It is therefore essential to test the thread core diameter after the forming process to ensure that it is true to gauge.



Tolerances of the pilot hole diameter

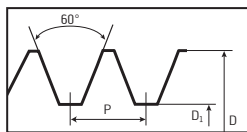
Pitch	Pilot hole diameter tolerance
$\leq 0.3 \text{ mm}$	$\pm 0.01 \text{ mm}$
$> 0.3 \text{ mm to } < 0.5 \text{ mm}$	$\pm 0.02 \text{ mm}$
$\geq 0.5 \text{ mm to } < 1 \text{ mm}$	$\pm 0.03 \text{ mm}$
$\geq 1 \text{ mm}$	$\pm 0.05 \text{ mm}$

Note:
The Walter Titex product range is designed to match the pilot hole diameters for tapping and thread forming.

Thread pilot hole diameters

Tapping/thread milling

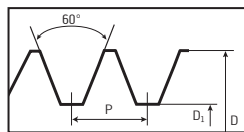
ISO metric thread



M ISO metric coarse-pitch thread DIN 13 and DIN ISO 965-1

D	P	D ₁		
Dia.	mm	Min. mm	Max. mm 5H/6H	Dia. mm
M1*	0,25	0,729	0,785	0,75
M1.1*	0,25	0,829	0,885	0,85
M1.2*	0,25	0,929	0,985	0,95
M1.4*	0,30	1,075	1,142	1,10
M1.6	0,35	1,221	1,321	1,25
M1.7	0,35	1,321	1,421	1,35
M1.8	0,35	1,421	1,521	1,45
M2	0,40	1,567	1,679	1,60
M2.2	0,45	1,713	1,838	1,75
M2.3	0,40	1,813	1,938	1,85
M2.5	0,45	2,013	2,138	2,05
M2.6	0,45	2,113	2,238	2,15
M3	0,50	2,459	2,599	2,50
M3.5	0,60	2,850	3,010	2,90
M4	0,70	3,242	3,422	3,30
M4.5	0,75	3,688	3,878	3,70
M5	0,80	4,134	4,334	4,20
M6	1,00	4,917	5,153	5,00
M7	1,00	5,917	6,153	6,00
M8	1,25	6,647	6,912	6,80
M9	1,25	7,647	7,912	7,80
M10	1,50	8,376	8,676	8,50
M11	1,50	9,376	9,676	9,50
M12	1,75	10,106	10,441	10,20
M14	2,00	11,835	12,210	12,00
M16	2,00	13,835	14,210	14,00
M18	2,50	15,294	15,744	15,50
M20	2,50	17,294	17,744	17,50
M22	2,50	19,294	19,744	19,50
M24	3,00	20,752	21,252	21,00
M27	3,00	23,752	24,252	24,00
M30	3,50	26,211	26,771	26,50
M33	3,50	29,211	29,771	29,50
M36	4,00	31,670	32,270	32,00
M39	4,00	34,670	35,270	35,00
M42	4,50	37,129	37,799	37,50
M45	4,50	40,129	40,799	40,50
M48	5,00	42,587	43,297	43,00
M52	5,00	46,587	47,297	47,00
M56	5,50	50,046	50,796	50,50
M60	5,50	54,046	54,796	54,50
M64	6,00	57,505	58,305	58,00
M68	6,00	62,505	62,305	62,00

*5H max.



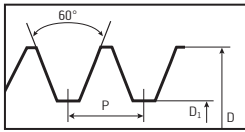
MF ISO metric fine-pitch thread DIN 13 and DIN ISO 965-1

D	P	D ₁		
Dia. × P	mm	Min. mm	Max. mm 6H	Dia. mm
M2 × 0.25		1,729	1,785	1,75
M2.2 × 0.25		1,929	1,985	1,95
M2.3 × 0.25		2,029	2,085	2,05
M2.5 × 0.35		2,121	2,221	2,15
M3 × 0.25		2,729	2,785	2,75
M3 × 0.35		2,621	2,721	2,65
M3.5 × 0.35		3,121	3,221	3,15
M4 × 0.35		3,621	3,721	3,65
M4 × 0.5		3,459	3,599	3,50
M4.5 × 0.5		3,959	4,099	4,00
M5 × 0.35		4,621	4,721	4,65
M5 × 0.5		4,459	4,599	4,50
M5 × 0.75		4,188	4,378	4,20
M6 × 0.5		5,459	5,599	5,50
M6 × 0.75		5,188	5,378	5,25
M7 × 0.5		6,459	6,599	6,50
M7 × 0.75		6,188	6,378	6,25
M8 × 0.5		7,459	7,599	7,50
M8 × 0.75		7,188	7,378	7,25
M8 × 1		6,917	7,153	7,00
M9 × 0.75		8,188	8,378	8,25
M9 × 1		7,917	8,153	8,00
M10 × 0.5		9,459	9,599	9,50
M10 × 0.75		9,188	9,378	9,25
M10 × 1		8,917	9,153	9,00
M10 × 1.25		8,647	8,912	8,75
M11 × 1		9,917	10,153	10,00
M12 × 0.5		11,459	11,599	11,50
M12 × 1		10,917	11,153	11,00
M12 × 1.25		10,647	10,912	10,75
M12 × 1.5		10,376	10,676	10,50
M13 × 1		11,917	12,153	12,00
M14 × 0.75		13,188	13,378	13,20
M14 × 1		12,917	13,153	13,00
M14 × 1.25		12,647	12,912	12,75
M14 × 1.5		12,376	12,676	12,50
M15 × 1		13,917	14,153	14,00
M15 × 1.5		13,376	13,676	13,50
M16 × 0.75		15,188	15,378	15,20
M16 × 1		14,917	15,153	15,00
M16 × 1.25		14,647	14,912	14,80
M16 × 1.5		14,376	14,676	14,50
M17 × 1		15,917	16,153	16,00
M18 × 1		16,917	17,153	17,00
M18 × 1.5		16,376	16,676	16,50
M18 × 2		15,835	16,210	16,00
M20 × 1		18,917	19,153	19,00
M20 × 1.5		18,376	18,676	18,50
M20 × 2		17,835	18,210	18,00
M22 × 1		20,917	21,153	21,00
M22 × 1.5		20,376	20,676	20,50
M22 × 2		19,835	20,210	20,00

Thread pilot hole diameters

Tapping/thread milling (continued)

ISO metric thread

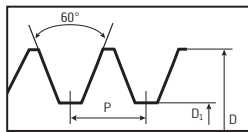


MF ISO metric fine-pitch thread

DIN 13 and DIN ISO 965-1

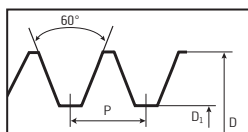
D Dia. x P	D ₁		 Dia. mm
	Min. mm	Max. mm 6H	
M24 x 1.5	22,376	22,676	22,50
M24 x 2	21,835	22,210	22,00
M25 x 1	22,917	23,153	23,00
M25 x 1.5	23,376	23,676	23,50
M26 x 1.5	24,376	24,676	24,50
M27 x 1	25,917	26,153	26,00
M27 x 1.5	25,376	25,676	25,50
M27 x 2	24,835	25,210	25,00
M28 x 1.5	26,376	26,676	26,50
M28 x 2	25,835	26,210	26,00
M30 x 1	28,917	29,153	29,00
M30 x 1.5	28,376	28,676	28,50
M30 x 2	27,835	28,210	28,00
M32 x 1.5	30,376	30,676	30,50
M32 x 2	29,835	30,210	30,00
M33 x 1.5	31,376	31,676	31,50
M33 x 2	30,835	31,210	31,00
M34 x 1.5	32,376	32,676	32,50
M35 x 1.5	33,376	33,676	33,50
M36 x 1.5	34,376	34,676	34,50
M36 x 2	33,835	34,210	34,00
M36 x 3	32,752	33,252	33,00
M38 x 1.5	36,376	36,676	36,50
M39 x 1.5	37,376	37,676	37,50
M39 x 2	36,835	37,210	37,00
M39 x 3	35,752	36,252	36,00
M40 x 1.5	38,376	38,676	38,50
M40 x 2	37,835	38,210	38,00
M40 x 3	36,752	37,252	37,00
M42 x 1.5	40,376	40,676	40,50
M42 x 2	39,835	40,210	40,00
M42 x 3	38,752	39,252	39,00
M45 x 1.5	43,376	43,676	43,50
M45 x 2	42,835	43,210	43,00
M45 x 3	41,752	42,252	42,00
M48 x 1.5	46,376	46,676	46,50
M48 x 2	45,835	46,210	46,00
M48 x 3	44,752	45,252	45,00
M50 x 1.5	48,376	48,676	48,50
M50 x 2	47,835	48,210	48,00
M50 x 3	46,752	47,252	47,00
M52 x 1.5	50,376	50,676	50,50
M52 x 2	49,835	50,210	50,00
M52 x 3	48,752	49,252	49,00
M56 x 1.5	54,376	54,676	54,50
M56 x 2	53,835	54,210	54,00
M56 x 3	52,752	53,252	53,00
M58 x 1.5	56,376	56,676	56,50
M60 x 1.5	58,376	58,676	58,50
M60 x 2	57,835	58,210	58,00
M60 x 3	56,752	57,252	57,00

American thread



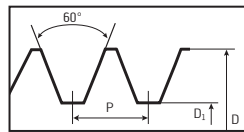
UN Eight-thread series
in accordance with ASME B1.1

D	D ₁		
Dia. P Gg/1"	Min. mm 2B/3B	Max. mm 2B	
1 1/8-8 UN	25,138	25,962	25,40
1 1/4-8 UN	28,313	29,126	28,50
1 3/8-8 UN	31,488	32,123	32,00
1 1/2-8 UN	34,663	35,456	35,00
1 5/8-8 UN	37,838	38,623	38,10
1 3/4-8 UN	41,013	41,790	41,50
1 7/8-8 UN	44,188	44,957	44,45
2-8 UN	47,363	48,125	48,00
2 1/4-8 UN	53,713	54,462	54,00



UNF Fine-pitch thread
in accordance with ASME B1.1

D	D ₁		
Dia. P Gg/1"	Min. mm 2B/3B	Max. mm 2B	
0-80 UNF	1,181	1,306	1,25
1-72 UNF	1,473	1,613	1,55
2-64 UNF	1,755	1,913	1,85
3-56 UNF	2,024	2,197	2,15
4-48 UNF	2,271	2,459	2,40
5-44 UNF	2,550	2,741	2,70
6-40 UNF	2,819	3,023	2,95
8-36 UNF	3,404	3,607	3,50
10-32 UNF	3,962	4,166	4,10
12-28 UNF	4,496	4,724	4,60
1/4-28 UNF	5,367	5,580	5,50
5/16-24 UNF	6,792	7,038	6,90
3/8-24 UNF	8,379	8,626	8,50
7/16-20 UNF	9,738	10,030	9,90
1/2-20 UNF	11,326	11,618	11,50
9/16-18 UNF	12,761	13,084	12,90
5/8-18 UNF	14,348	14,671	14,50
3/4-16 UNF	17,330	17,689	17,50
7/8-14 UNF	20,262	20,663	20,40
1-12 UNF	23,109	23,569	23,25
1 1/8-12 UNF	26,284	26,744	26,50
1 1/4-12 UNF	29,459	29,919	29,50
1 3/8-12 UNF	32,634	33,094	33,00
1 1/2-12 UNF	35,809	36,269	36,10



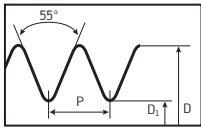
UNC Coarse-pitch thread
in accordance with ASME B1.1

D	D ₁		
Dia. P Gg/1"	Min. mm 2B/3B	Max. mm 2B	
1-64 UNC	1,425	1,582	1,55
2-56 UNC	1,694	1,872	1,85
3-48 UNC	1,941	2,146	2,10
4-40 UNC	2,156	2,385	2,35
5-40 UNC	2,487	2,697	2,65
6-32 UNC	2,642	2,896	2,85
8-32 UNC	3,302	3,531	3,50
10-24 UNC	3,683	3,962	3,90
12-24 UNC	4,343	4,597	4,50
1/4-20 UNC	4,976	5,268	5,10
5/16-18 UNC	6,411	6,734	6,60
3/8-16 UNC	7,805	8,164	8,00
7/16-14 UNC	9,149	9,550	9,40
1/2-13 UNC	10,584	11,013	10,80
9/16-12 UNC	11,996	12,456	12,20
5/8-11 UNC	13,376	13,868	13,50
3/4-10 UNC	16,299	16,833	16,50
7/8-9 UNC	19,169	19,748	19,50
1-8 UNC	21,963	22,598	22,25
1 1/8-7 UNC	24,648	25,348	25,00
1 1/4-7 UNC	27,823	28,524	28,00
1 1/2-6 UNC	33,518	34,295	34,00
1 3/4-5 UNC	38,951	39,814	39,50
2-4,5 UNC	44,689	45,598	45,00

Thread pilot hole diameters

Tapping/thread milling (continued)

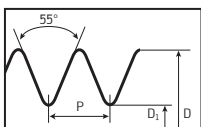
Pipe thread



G Pipe thread
in accordance with DIN EN ISO 228

D Dia. P Gg/1"	D ₁		Dia. mm DIN 336 / ISO 2306
	Min. mm	Max. mm	
G 1/16-28	6,561	6,843	6,80
G 1/8-28	8,566	8,848	8,80
G 1/4-19	11,445	11,890	11,80
G 3/8-19	14,950	15,395	15,25
G 1/2-14	18,632	19,173	19,00
G 5/8-14	20,588	21,129	21,00
G 3/4-14	24,118	24,659	24,50
G 7/8-14	27,878	28,419	28,25
G 1-11	30,292	30,932	30,75
G 1 1/8-11	34,940	35,580	35,50
G 1 1/4-11	38,953	39,593	39,50
G 1 3/8-11	41,366	42,006	41,90
G 1 1/2-11	44,846	45,486	45,25
G 1 3/4-11	50,789	51,429	51,00
G 2-11	56,657	57,297	57,00
G 2 1/4-11	62,753	63,393	63,00
G 2 1/2-11	72,227	72,867	72,60
G 3-11	84,927	85,567	85,00

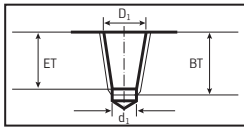
Whitworth thread



Rp Whitworth pipe thread
in accordance with DIN EN 10226-1

D Dia. P Gg/1"	D ₁		Dia. mm DIN 336 / ISO 2306
	Min. mm	Max. mm	
Rp 1/16-28	6,490	6,632	6,55
Rp 1/8-28	8,495	8,637	8,60
Rp 1/4-19	11,341	11,549	11,50
Rp 3/8-19	14,846	15,054	15,00
Rp 1/2-14	18,490	18,774	18,50
Rp 5/8-14	20,446	20,730	20,50
Rp 3/4-14	23,976	24,260	24,00
Rp 1-11	30,112	30,472	30,25
Rp 1 1/4-11	38,773	39,133	39,00
Rp 1 1/2-11	44,629	45,063	45,00
Rp 2-11	56,440	56,874	56,50
Rp 2 1/2-11	72,010	72,444	72,20
Rp 3-11	84,710	85,144	85,00

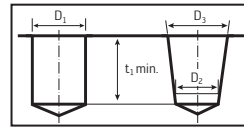
Whitworth thread



Rc Tapered pipe thread,
taper 1:16 in accordance with DIN EN 10226-2

Dia. P Gg/1"	d ₁ mm	D ₁ mm	ET mm	Min. BT mm
Rc 1/16-28	6,3	6,49	8,31	10,0
Rc 1/8-28	8,3	8,50	8,31	10,1
Rc 1/4-19	11,0	11,35	12,37	15,0
Rc 3/8-19	14,5	14,85	12,77	15,4
Rc 1/2-14	18,1	18,49	16,83	20,5
Rc 3/4-14	23,5	23,98	18,13	21,8
Rc 1-11	29,6	30,11	21,42	26,0
Rc 1 1/4-11	38,1	38,78	23,72	28,3
Rc 1 1/2-11	44,0	44,67	23,72	28,3
Rc 2-11	55,6	56,48	28,02	32,6
Rc 2 1/2-11	71,1	72,00	31,32	37,1
Rc 3-11	83,6	84,71	34,42	40,2

American pipe thread



NPT American standard pipe thread
in accordance with ASME B1.20.1, taper 1:16

Dia. P Gg/1"	D ₁ mm	D ₂ mm	D ₃ mm	t ₁ mm
1/16-27 NPT	6,15	5,95	6,39	10,7
1/8-27 NPT	8,40	8,31	8,74	10,8
1/4-18 NPT	11,10	10,73	11,36	15,6
3/8-18 NPT	14,30	14,15	14,80	16,0
1/2-14 NPT	17,90	17,47	18,32	20,8
3/4-14 NPT	23,30	22,79	23,67	21,3
1-11,5 NPT	29,00	28,64	29,69	25,6
1 1/4-11,5 NPT	37,70	37,37	38,45	26,1
1 1/2-11,5 NPT	43,70	43,44	44,52	26,1
2-11,5 NPT	55,60	55,45	56,56	26,5
2 1/2-8 NPT	66,30	66,14	67,62	36,3
3-8 NPT	82,30	81,90	83,52	38,5

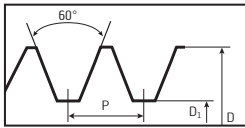
NPTF American standard pipe thread
in accordance with ASME B1.20.3, taper 1:16

Dia. P Gg/1"	D ₁ mm	D ₂ mm	D ₃ mm	t ₁ mm
1/16-27 NPTF	6,1	5,97	6,41	10,3
1/8-27 NPTF	8,4	8,33	8,77	10,3
1/4-18 NPTF	11,0	10,77	11,40	15,0
3/8-18 NPTF	14,5	14,19	14,84	15,3
1/2-14 NPTF	17,5	17,48	18,33	19,9
3/4-14 NPTF	23,0	22,84	23,72	20,4
1-11 1/2 NPTF	29,0	28,62	29,76	24,5
1 1/4-11,5 NPTF	37,5	37,44	38,52	25,0
1 1/2-11,5 NPTF	43,5	43,50	44,59	25,0
2-11,5 NPTF	56,0	55,51	56,62	25,4
2 1/2-8 NPTF	66,0	66,03	67,71	38,0
3-8 NPTF	82,0	81,80	83,62	40,0

Thread pilot hole diameters

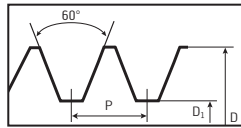
Tapping/thread milling (continued)

Thread insert



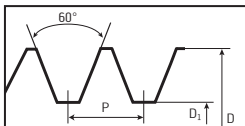
EG M ISO metric coarse-pitch thread in accordance with DIN 8140

D		D ₁		
Dia.	P mm	Min. mm	Max. mm	Dia. mm
EG M2,5	0,45	2,597	2,697	2,65
EG M3	0,50	3,109	3,221	3,15
EG M3,5	0,60	3,630	3,755	3,70
EG M4	0,70	4,152	4,292	4,20
EG M5	0,80	5,174	5,334	5,25
EG M6	1,00	6,217	6,407	6,30
EG M8	1,25	8,217	8,483	8,40
EG M10	1,50	10,324	10,560	10,50
EG M12	1,75	12,380	12,645	12,50
EG M14	2,00	14,433	14,733	14,50
EG M16	2,00	16,433	16,733	16,50
EG M18	2,50	18,542	18,897	18,80
EG M20	2,50	20,542	20,897	20,80
EG M22	2,50	22,542	22,897	22,80
EG M24	3,00	24,649	25,049	24,75



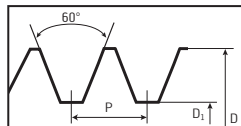
EG MF ISO metric fine-pitch thread in accordance with DIN 8140

D	D ₁		
Dia. × P	Min. mm	Max. mm	Dia. mm
EG M8 × 1	8,217	8,407	8,3
EG M10 × 1	10,217	10,407	10,3
EG M10 × 1.25	10,217	10,438	10,4
EG M12 × 1.25	12,217	12,438	12,4
EG M12 × 1.5	12,324	12,560	12,5
EG M14 × 1.5	14,324	14,560	14,5
EG M16 × 1.5	16,324	16,560	16,5
EG M18 × 1.5	18,324	18,560	18,5
EG M18 × 2	18,433	18,733	18,5
EG M20 × 1.5	20,324	20,560	20,5



EG UNC Unified coarse-pitch threads for wire inserts

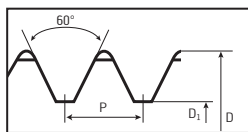
D	D ₁		
Dia.	Min. mm	Max. mm	Dia. mm
EG Nr. 2–56	2,282	2,441	2,35
EG Nr. 3–48	2,630	2,804	2,70
EG Nr. 4–40	2,982	3,180	3,05
EG Nr. 5–40	3,312	3,487	3,40
EG Nr. 6–32	3,677	3,879	3,70
EG Nr. 8–32	4,338	4,524	4,40
EG Nr. 10–24	5,055	5,283	5,10
EG Nr. 12–24	5,715	5,944	5,80
EG 1/4–20	6,625	6,868	6,70
EG 5/16–18	8,244	8,489	8,40
EG 3/8–16	9,869	10,127	10,00
EG 7/16–14	11,505	11,783	11,70
EG 1/2–13	13,123	13,393	13,30
EG 9/16–12	14,747	15,031	15,00
EG 5/8–11	16,376	16,673	16,50
EG 3/4–10	19,598	19,908	19,75



EG UNF Unified fine-pitch threads for wire thread inserts

D ₁			
Dia.	Min. mm	Max. mm	Dia. mm
EG Nr. 2–64	2,270	2,405	2,30
EG Nr. 3–56	2,614	2,758	2,65
EG Nr. 4–48	2,962	3,122	3,00
EG Nr. 5–44	3,300	3,467	3,30
EG Nr. 6–40	3,644	3,818	3,70
EG Nr. 8–36	4,321	4,498	4,40
EG Nr. 10–32	4,999	5,184	5,10
EG 1/4–28	6,545	6,721	6,60
EG 5/16–24	8,166	8,351	8,20
EG 3/8–24	9,754	9,931	9,80
EG 7/16–20	11,387	11,585	11,40
EG 1/2–20	12,970	13,172	13,00

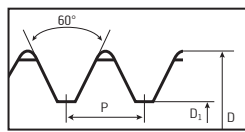
ISO metric thread



MJ Coarse-pitch thread in accordance with DIN ISO 5855

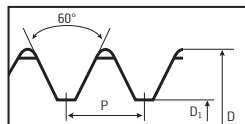
D	D ₁		
Dia. × P	Min. mm	Max. mm	Dia. mm
MJ3 × 0.5	2,513	2,653	2,60
MJ4 × 0.7	3,318	3,498	3,40
MJ5 × 0.8	4,221	4,421	4,30
MJ6 × 1	5,026	5,215	5,10
MJ8 × 1.25	6,782	6,994	6,90
MJ10 × 1.5	8,539	8,779	8,70
MJ12 × 1.75	10,295	10,563	10,50
MJ16 × 2	14,051	14,351	14,30

American thread



UNJC Coarse-pitch thread in accordance with ASME B1.15 and ISO 3161

D	D ₁		
Dia. P Gg/1"	Min. mm 3B	Max. mm 3B	Dia. mm
1-64 UNJC	1,467	1,570	1,50
2-56 UNJC	1,742	1,860	1,80
3-48 UNJC	1,999	2,137	2,05
4-40 UNJC	2,226	2,391	2,30
5-40 UNJC	2,556	2,721	2,65
6-32 UNJC	2,732	2,938	2,80
8-32 UNJC	3,393	3,599	3,50
10-24 UNJC	3,795	4,064	3,90
12-24 UNJC	4,455	4,704	4,60
1/4-20 UNJC	5,113	5,387	5,20
5/16-18 UNJC	6,563	6,833	6,70
3/8-16 UNJC	7,978	8,255	8,10
7/16-14 UNJC	9,344	9,637	9,50
1/2-13 UNJC	10,796	11,093	10,90
9/16-12 UNJC	12,226	12,480	12,30
5/8-11 UNJC	13,625	13,902	13,70
3/4-10 UNJC	16,575	16,880	16,75



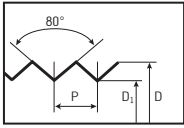
UNJF Fine-pitch thread in accordance with ASME B1.15 and ISO 3161

D	D ₁		
Dia. P Gg/1"	Min. mm 3B	Max. mm 3B	Dia. mm
0-80 UNJF	1,215	1,297	1,25
1-72 UNJF	1,510	1,602	1,55
2-64 UNJF	1,797	1,900	1,85
3-56 UNJF	2,073	2,191	2,10
4-48 UNJF	2,329	2,467	2,40
5-44 UNJF	2,613	2,763	2,70
6-40 UNJF	2,886	3,051	2,95
8-36 UNJF	3,479	3,662	3,60
10-32 UNJF	4,053	4,253	4,15
12-28 UNJF	4,602	4,815	4,70
1/4-28 UNJF	5,466	5,662	5,60
5/16-24 UNJF	6,907	7,110	7,00
3/8-24 UNJF	8,494	8,680	8,60
7/16-20 UNJF	9,875	10,083	10,00
1/2-20 UNJF	11,463	11,660	11,50
9/16-18 UNJF	12,913	13,123	13,00
5/8-18 UNJF	14,500	14,702	14,50

Thread pilot hole diameters

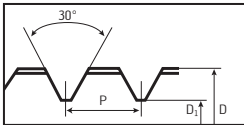
Tapping/thread milling (continued)

Miscellaneous



Pg Steel conduit thread in accordance with DIN 40430

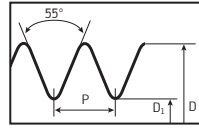
D	D ₁		
Dia. P Gg/1"	Min. mm	Max. mm	Dia. mm
Pg 7 × 20	11,29	11,43	11,40
Pg 9 × 18	13,85	14,01	14,00
Pg 11 × 18	17,25	17,41	17,25
Pg 13,5 × 18	19,05	19,21	19,00
Pg 16 × 18	21,15	21,31	21,25
Pg 21 × 16	26,79	27,03	27,00
Pg 29 × 16	35,49	35,73	35,50
Pg 36 × 16	45,49	45,73	45,50
Pg 42 × 16	52,49	52,73	52,50
Pg 48 × 16	57,79	58,03	58,00



Tr ISO metric trapezoidal thread

D	D ₁		
Dia. × P	Min. mm	Max. mm	Dia. mm
8 × 1,5	6,5	6,69	6,60
9 × 2	7,0	7,236	7,20
10 × 2	8,0	8,236	8,20
11 × 3	8,0	8,315	8,25
12 × 3	9,0	9,315	9,25
14 × 3	11,0	11,315	11,25
16 × 4	12,0	12,375	12,25
18 × 4	14,0	14,375	14,25
20 × 4	16,0	16,375	16,25
22 × 5	17,0	17,45	17,25
24 × 5	19,0	19,45	19,25
26 × 5	21,0	21,45	21,25
28 × 5	23,0	23,45	23,25
30 × 6	24,0	24,5	24,25
32 × 6	26,0	26,5	26,25
34 × 6	28,0	28,5	28,25
36 × 6	30,0	30,5	30,25
38 × 7	31,0	31,56	31,50
40 × 7	33,0	33,56	33,50
42 × 7	35,0	35,56	35,50
44 × 7	37,0	37,56	37,50
46 × 8	38,0	38,63	38,50
48 × 8	40,0	40,63	40,50
50 × 8	42,0	42,63	42,50
52 × 8	44,0	44,63	44,50

Whitworth thread



BSW Whitworth thread in accordance with BS 84

D	D ₁		
Dia. P Gg/1"	Medium min. mm	Class max. mm	Dia. mm
1/16–60	1,045	1,231	1,20
3/32–48	1,703	1,911	1,90
1/8–40	2,362	2,590	2,50
5/32–32	2,952	3,213	3,10
3/16–24	3,407	3,745	3,60
7/32–24	4,201	4,539	4,50
1/4–20	4,724	5,155	5,00
5/16–18	6,131	6,591	6,50
3/8–16	7,493	7,988	7,90
7/16–14	8,790	9,330	9,20
1/2–12	9,989	10,590	10,50
9/16–12	11,577	12,178	12,00
5/8–11	12,919	13,558	13,40
3/4–10	15,798	16,484	16,40
7/8–9	18,612	19,354	19,25
1–8	21,335	22,148	22,00
1 1/8–7	23,929	24,833	24,75
1 1/4–7	27,104	28,008	27,50
1 3/8–6	29,505	30,529	30,00
1 1/2–6	32,680	33,704	33,50
1 5/8–5	34,771	35,965	35,50
1 3/4–5	37,946	39,140	39,00
1 7/8–4,5	40,398	41,705	41,50
2–4 1/2	43,573	44,880	44,50
2 1/4–4	49,020	50,468	50,00
2 1/2–4	55,370	56,818	56,00

Thread pilot hole diameters

Thread forming

M ISO metric coarse-pitch thread DIN 13 and DIN ISO 965-1

Dia.	P mm	 Dia. mm
M1	0,25	0,88
M1.1	0,25	0,98
M1.2	0,25	1,08
M1.4	0,30	1,26
M1.6	0,35	1,45
M1.7	0,35	1,55
M1.8	0,35	1,65
M2	0,40	1,82
M2.2	0,45	2,00
M2.3	0,40	2,10
M2.5	0,45	2,30
M2.6	0,45	2,40
M3	0,50	2,80
M3.5	0,60	3,25
M4	0,70	3,70
M5	0,80	4,65
M6	1,00	5,55
M8	1,25	7,40
M10	1,50	9,30
M12	1,75	11,20
M14	2,00	13,10
M16	2,00	15,10
M18	2,50	16,90
M20	2,50	18,90
M22	2,50	20,90
M24	3,00	22,70

MF ISO metric fine-pitch thread DIN 13 and DIN ISO 965-1

Dia. × P	 Dia. mm
M4 × 0,5	3,80
M5 × 0,5	4,80
M6 × 0,5	5,80
M6 × 0,75	5,65
M7 × 0,75	6,65
M8 × 0,75	7,65
M8 × 1	7,55
M10 × 0,75	9,65
M10 × 1	9,55
M10 × 1,25	9,40
M12 × 1	11,55
M12 × 1,25	11,40
M12 × 1,5	11,30
M14 × 1	13,55
M14 × 1,5	13,30
M16 × 1	15,55
M16 × 1,5	15,30
M18 × 1	17,55
M18 × 1,5	17,30
M20 × 1,5	19,30
M20 × 2	19,10
M22 × 1,5	21,30

UNC Coarse-pitch thread in accordance with ASME B1.1

Dia. P Gg/1"	 Dia. mm
2-56 UNC	1,97
3-48 UNC	2,26
4-40 UNC	2,55
5-40 UNC	2,87
6-32 UNC	3,15
8-32 UNC	3,80
10-24 UNC	4,30
12-24 UNC	5,00
1/4-20 UNC	5,75
5/16-18 UNC	7,25
3/8-16 UNC	8,75
7/16-14 UNC	10,30
1/2-13 UNC	11,80
9/16-12 UNC	13,30
5/8-11 UNC	14,80
3/4-10 UNC	17,90

UNF Fine-pitch thread in accordance with ASME B1.1

Dia. P Gg/1"	 Dia. mm
2-64 UNF	2,00
3-56 UNF	2,30
4-48 UNF	2,60
5-44 UNF	2,90
6-40 UNF	3,20
8-36 UNF	3,85
10-32 UNF	4,45
12-28 UNF	5,05
1/4-28 UNF	5,90
5/16-24 UNF	7,45
3/8-24 UNF	9,00
7/16-20 UNF	10,50
1/2-20 UNF	12,10
9/16-18 UNF	13,70
5/8-18 UNF	15,25
3/4-16 UNF	18,40
7/8-14 UNF	21,40
1-12 UNF	24,45

Thread pilot hole diameters

Thread forming (continued)

UNEF Extra fine-pitch thread in accordance with ASME B1.1

Dia. P Gg/1"	Dia. mm
1/4-32 UNEF	6,00
5/16-32 UNEF	7,60
3/8-32 UNEF	9,10
7/16-28 UNEF	10,70
1/2-28 UNEF	12,30
9/16-24 UNEF	13,80
5/8-24 UNEF	15,40
3/4-20 UNEF	18,50
7/8-20 UNEF	21,60
1-20 UNEF	24,80

G Pipe thread in accordance with DIN EN ISO 228

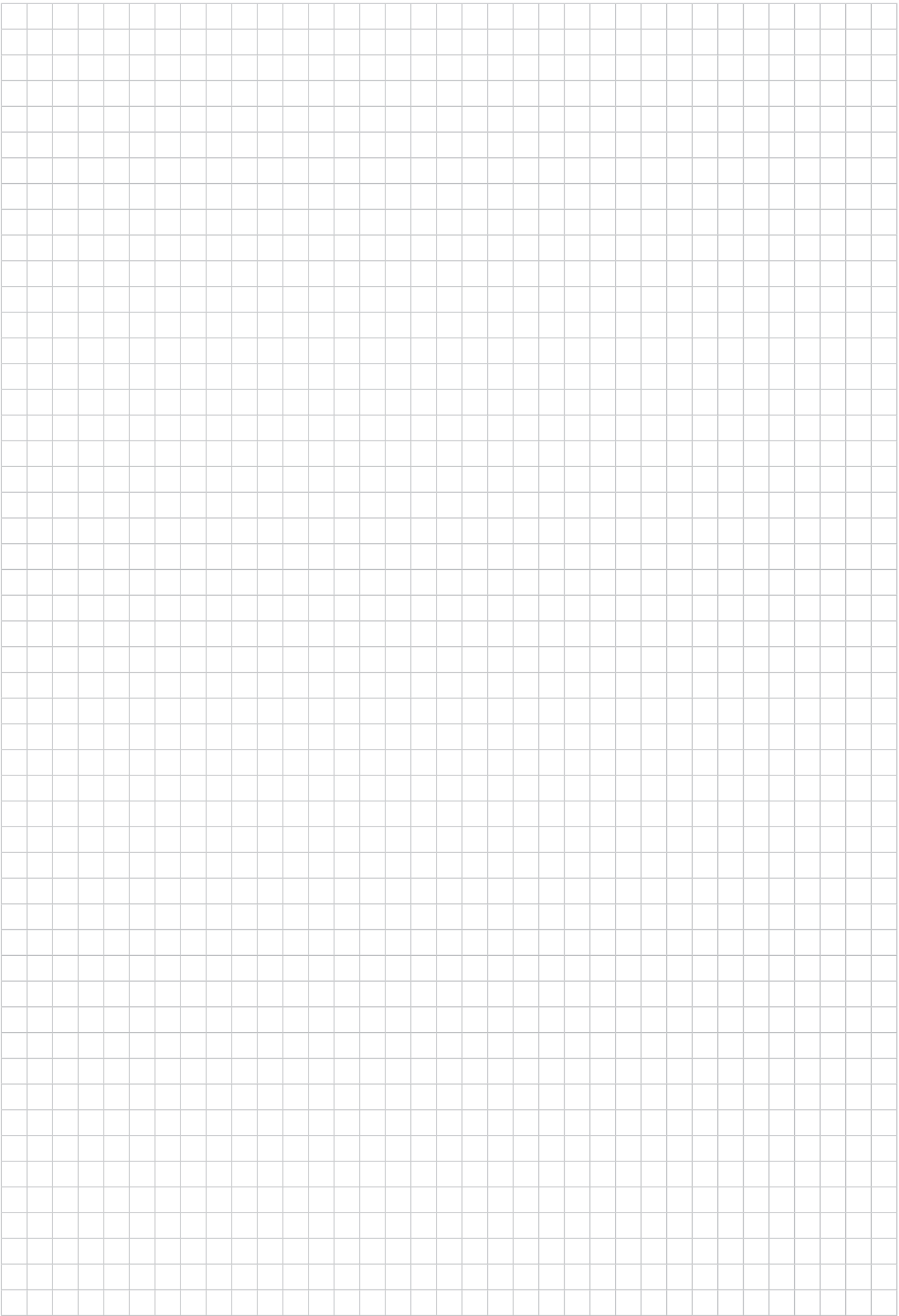
Dia. P Gg/1"	Dia. mm
G 1/16	7,25
G 1/8-28	9,25
G 1/4-28	12,50
G 3/8-19	16,00
G 1/2-19	20,00
G 5/8-14	22,00
G 3/4-14	25,50
G 7/8-14	29,25
G 1-11	32,00

EG M ISO metric coarse-pitch thread in accordance with DIN 8140

Dia.	P mm	Dia. mm
EG M3	0,50	3,40
EG M4	0,70	4,60
EG M5	0,80	5,65
EG M6	1,00	6,85
EG M8	1,25	9,05
EG M10	1,50	11,30
EG M12	1,75	13,50

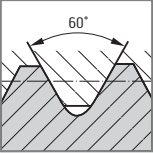
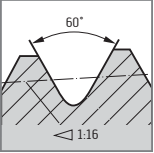
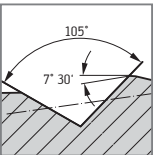
BSW Whitworth thread in accordance with BS 84

Dia. P Gg/1"	Dia. mm
3/32-48	2,10
1/8-40	2,85
5/32-32	3,55
3/16-24	4,20
1/4-20	5,70
5/16-18	7,20
3/8-16	8,70
7/16-14	10,20
1/2-12	11,60
9/16-12	13,20
5/8-11	14,70
11/16-11	16,25
3/4-10	17,70
7/8-9	20,75
1-8	23,75



Thread types

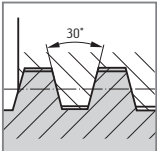
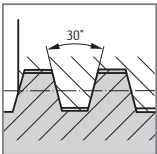
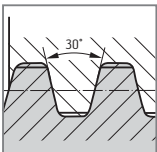
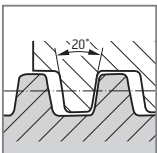
DIN thread types (excerpt from DIN 202)

Profile (diagram)	Name	Code letters	Short designation ¹ Examples	Nominal size	As specified in	Application	
	ISO metric thread (single-start or multi-start)	M	M0,8	0,3–0,9 mm	DIN 14-1 – DIN 14-4	Watches and precision engineering	
			M0,8 ²	1–68 mm	DIN 13-1	General purpose (coarse-pitch threads)	
			M24 × 4 P 2		DIN 13-52		
			M6 × 0,75 ² M8 × 1 – LH ²	1–1 000 mm	DIN 13-2 – DIN 13-11	General purpose, to be used where the pitch of the coarse-pitch thread is too large (fine-pitch thread)	
			M24 × 4 P 2		DIN 13-52		
			M64 × 4	64 mm and 76 mm	DIN 6630	External thread for barrel joints	
			M30 × 2 – 4H5H	1,4–355 mm	LN 9163-1 – LN 9163-7 LN 9163-10 and LN 9163-11	Aerospace	
	ISO metric thread with transition tolerance range (formerly thread for interference fits)		M10 Sn 4 M10 Sk 6	3–150 mm	DIN 13-51	Screw-in end on studs	Non-sealing
			M10 Sn 4 sealing				Sealing
	Metric thread with large clearance		M36	12–180 mm	DIN 2510-2	Bolted connections with reduced shank	
	ISO metric screw thread, helical coil thread for thread inserts	EG M	EG M20	2–52 mm	DIN 8140-2	Helical coil thread (coarse-pitch and fine-pitch thread) for wire thread inserts	
	ISO metric thread for interference fits	MFS	MFS 12 × 1,5	5–16 mm	DIN 8141-1	Interference fits in aluminium cast alloys (coarse-pitch and fine-pitch thread)	
	Metric tapered external thread	M	M30 × 2 keg	6–16 mm	DIN 158-1	Screw plugs and lubricating nipples	
			M30 × 2 keg (short)				
	Self-forming tapered external thread	S	S8 × 1	6–10 mm	DIN 71412	Tapered lubricating nipples; Thread similar to DIN 158-1, but with 105° thread profile angle	

¹ Full designations are given in the relevant standards.

² Designation in accordance with DIN ISO 965-1

DIN thread types (excerpt from DIN 202)

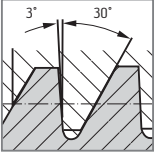
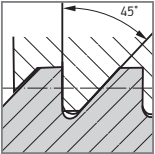
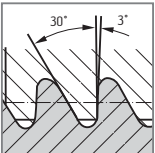
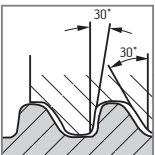
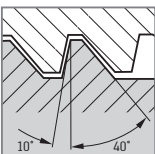
Profile (diagram)	Name	Code letters	Short designation ¹ Examples	Nominal size	As specified in	Application
	ISO metric trapezoidal thread (single-start or multi-start)	TR	Tr40 × 7	8–300 mm	DIN 103-1 – DIN 103-8	General
	Tr40 × 14 P7					
	Tr40 × 7		DIN 380-1 and DIN 380-2			
	Tr40 × 14 P7					
	Trapezoidal thread (single-start or two-start) with clearance	TR	Tr48 × 12	48 mm	DIN 263-1 and DIN 263-2	Rail vehicles
			Tr40 × 16 P8	40 mm		
			Tr32 × 1,5	10–56 mm	DIN 6341-2	Draw-in collets
	Rounded trapezoidal thread	TR	Tr40 × 5	26–80 mm	DIN 30295-1 and DIN 30295-2	Rail vehicles
	Trapezoidal thread	KT	KT22	10–50 mm	DIN 6063-2	Plastic containers

¹ Full designations are given in the relevant standards.

Thread types

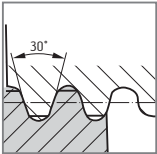
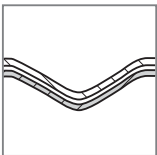
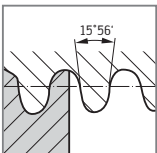
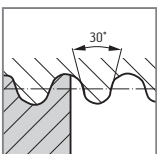
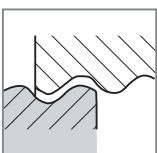
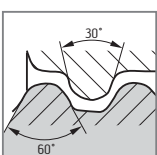
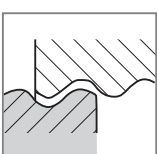
(continued)

DIN thread types (excerpt from DIN 202)

Profile (diagram)	Name	Code letters	Short designation ¹ Examples	Nominal size	As specified in	Application
	Metric buttress thread (single-start or multi-start)	S	S 48 × 8	10–640 mm	DIN 513-1 – DIN 513-3	Absorbing forces acting in one direction
			S 40 × 14 P 7			
	45° buttress thread	S	S 630 × 20	100–1250 mm	DIN 2781	Hydraulic presses
  	Buttress thread	S	S 25 × 1,5	6–40 mm	DIN 20401-1 and DIN 20401-2	Mining
			S 22	10–50 mm	DIN 55525	Plastic and glass containers in packaging
		GS	GS 22			
		KS	KS 22	10–50 mm	DIN 6063-1	Plastic containers in packaging
			KS 22			

¹ Full designations are given in the relevant standards.

DIN thread types (excerpt from DIN 202)

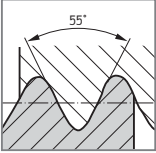
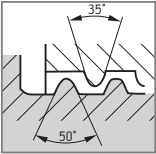
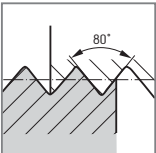
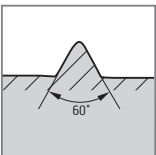
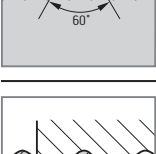
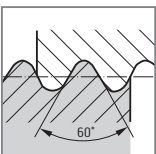
Profile (diagram)	Name	Code letters	Short designation ¹ Examples	Nominal size	As specified in	Application
 	Parallel knuckle thread (single-start or multi-start)	Rd	Rd 40 × 1/6 Rd 40 × 1/3 P 1/6	8–200 mm	DIN 405-1 and DIN 405-2	General
	Parallel knuckle thread		Rd 40 × 5	10–300 mm	DIN 20400	Mining, with increased load-bearing depth
			Rd 80 × 10	50–320 mm	DIN 15403	Lifting hooks
			Rd 70	20–100 mm	DIN 7273-1	Steel sheet pieces and associated couplings
 	Parallel round screw thread with clearance	Rd	Rd 59 × 7	34–79 mm	DIN 262-1 and DIN 262-2	Rail vehicles
			Rd 59 × 7 left			
			Rd 50 × 7	50 mm	DIN 264-1 and DIN 264-2	Rail vehicles
			Rd 50 × 7 left			
 	Parallel knuckle thread	Rd	Rd 40 × 1/7	40 mm, 80 mm and 110 mm	DIN 3182-1	Respiratory protective devices
		GL	GL 25 × 3	8–40 mm	DIN 168-1	Glass containers
	Edison thread	E	E27	14 mm 16 mm 18 mm 27 mm 33 mm	DIN 40400	D-type fuses; E14 and E27 also for lamp caps and holders
			E5	5 mm	DIN EN 60061-1	Lamp caps
			E10	10 mm		
			E40	40 mm		
		–	28 × 2	28 mm and 40 mm	DIN EN 60399	External thread for lampholders and internal thread for shade holder rings

¹ Full designations are given in the relevant standards.

Thread types

(continued)

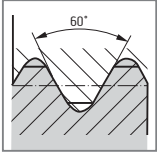
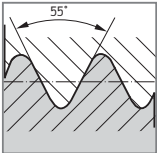
DIN thread types (excerpt from DIN 202)

Profile (diagram)	Name	Code letters	Short designation ¹ Examples	Nominal size	As specified in	Application
	Parallel Whitworth thread	W	W $\frac{3}{16}$	$\frac{3}{16}$	DIN 49301	D-type screw-in gauge rings; DII and DIII in electrical engineering
	Glass thread	Glass thread	74.5 glass thread	74,5 mm 84,5 mm 99 mm 123,5 mm 158 mm 188 mm	DIN 40450	Electrical engineering for glass guards and caps
	Steel conduit thread	Pg ²	Pg 21	7–48 mm	DIN 40430	Electrical engineering
	Tapping screw thread	ST	ST 3,5	1,5–9,5 mm	DIN EN ISO 1478	Tapping screws
	Wood screw thread	–	4	1,6–20 mm	DIN 7998	Wood screws
	Bicycle thread	FG	FG 9,5	2–34,8 mm	DIN 79012	Bicycles and mopeds
		–	1,375–24 6H/6g	1,375 mm	DIN EN ISO 6698	Assembly of freewheels on bicycle hubs

¹ Full designations are given in the relevant standards.

² With DIN notice 04/99, it was announced that the DIN standards relating to screw connections with steel conduit threads have been withdrawn and are superseded by metric cable glands in accordance with DIN EN 50262.

Thread types in accordance with standards of other countries

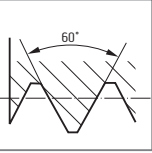
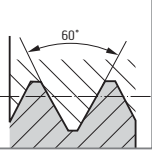
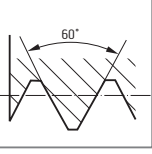
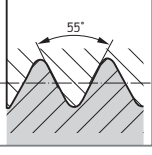
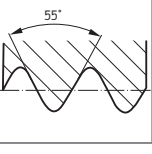
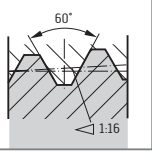
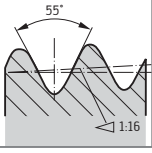
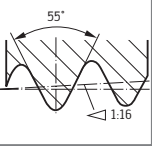
Profile (diagram)	Name	Code letters	Short designation Examples	As specified in	Application
	Unified screw thread	UNC UNF UNEF	Nr. 6 (0.138)– 32 UNC-2A	ASME B1.1	USA United Kingdom
		UN UNC UNF UNEF UNS			
		UNR UNRC UNRF UNREF UNRS			
		UNJ UNJC UNJF UNJEF			
	Whitworth thread	BSW BSF	$\frac{1}{4}$ in.–20 BSW	BS 84	United Kingdom
	B.A. thread	B.A.	11 B.A.	BS 93	

¹ For thread diameters of less than $\frac{1}{4}$ inch² External thread with rounded thread root

Thread types

(continued)

Thread types in accordance with standards of other countries

Profile (diagram)	Name	Code letters	Short designation Examples	As specified in	Application
	Parallel pipe thread	NPSC	$\frac{1}{8}$ –27 NPSC	ANSI / ASME B1.20.1	USA
		NPSM NPSL			
		NPSH NH	$\frac{1}{2}$ –14 NPSH $\frac{3}{4}$ –11.5 NH	ASME B1.20.7	
		Dryseal NPSF Dryseal NPSI	$\frac{1}{8}$ –28 NPSF	ASME B1.20.3	
		G $\triangleq$ BSP $\triangleq$ PF	G $1\frac{1}{4}$	DIN EN ISO 228-1 BS 2779	United Kingdom
		Rp $\triangleq$ BSPP $\triangleq$ PF	Rp $\frac{1}{4}$	DIN EN 10226-1 BS 21 ISO 7/1	
	Tapered pipe thread	NPT NPTR	$\frac{3}{8}$ –18 NPT	ASME B1.20.1	USA
		Dryseal NPTF Dryseal PTF-SAE-SHORT	$\frac{1}{8}$ –27 NPTF-1 ³	ANSI B1.20.3	
		R ¹	R $\frac{1}{2}$	DIN EN 10226-1 BS 21 ISO 7/1	United Kingdom
		Rc $\triangleq$ BSPT $\triangleq$ PT	Rc $\frac{1}{2}$		

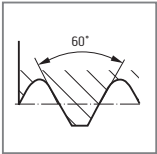
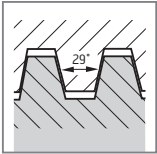
¹ External thread

² Profile perpendicular to the axis.

³ –1 or –2 is the NPTF thread class; –1 is the gauging system **without** checking the bottom or point flat.

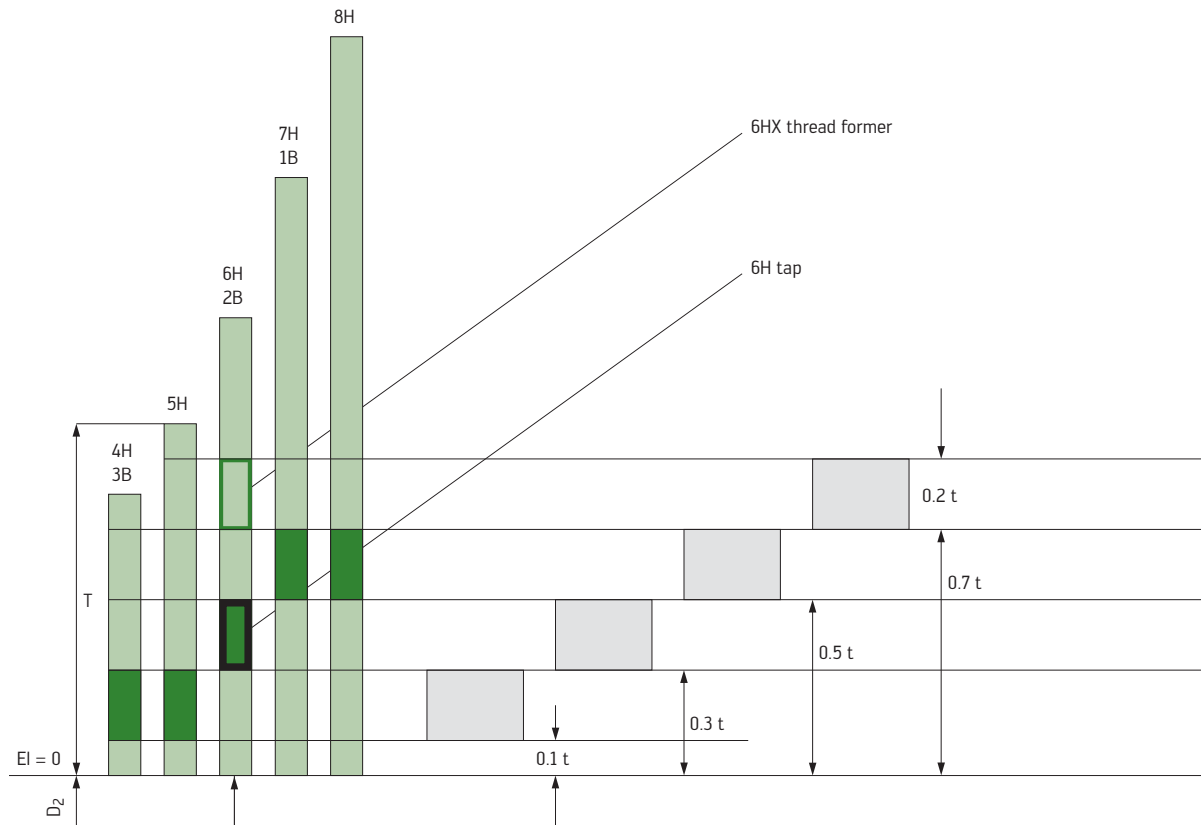
–2 is the gauging system **with** checking the bottom or point flat (= new gauging system in accordance with ANSI B1.20.5).

Thread types in accordance with standards of other countries

Profile (diagram)	Name	Code letters	Short designation Examples	As specified in	Application
	Wire thread insert	UNC-STI UNF-STI	$\frac{1}{4}$ -20 UNC-2B-STI or 0.125-20 UNC-2B-STI	ASME B18.29.1	USA
	Trapezoidal thread	ACME	$1\frac{3}{4}$ -4 ACME-2G	ASME B1.5	USA
				BS 1104	United Kingdom
		Stub-ACME	0.500-20 STUB ACME	ANSI B1.8	USA

Tolerance units

4H to 8H internal thread

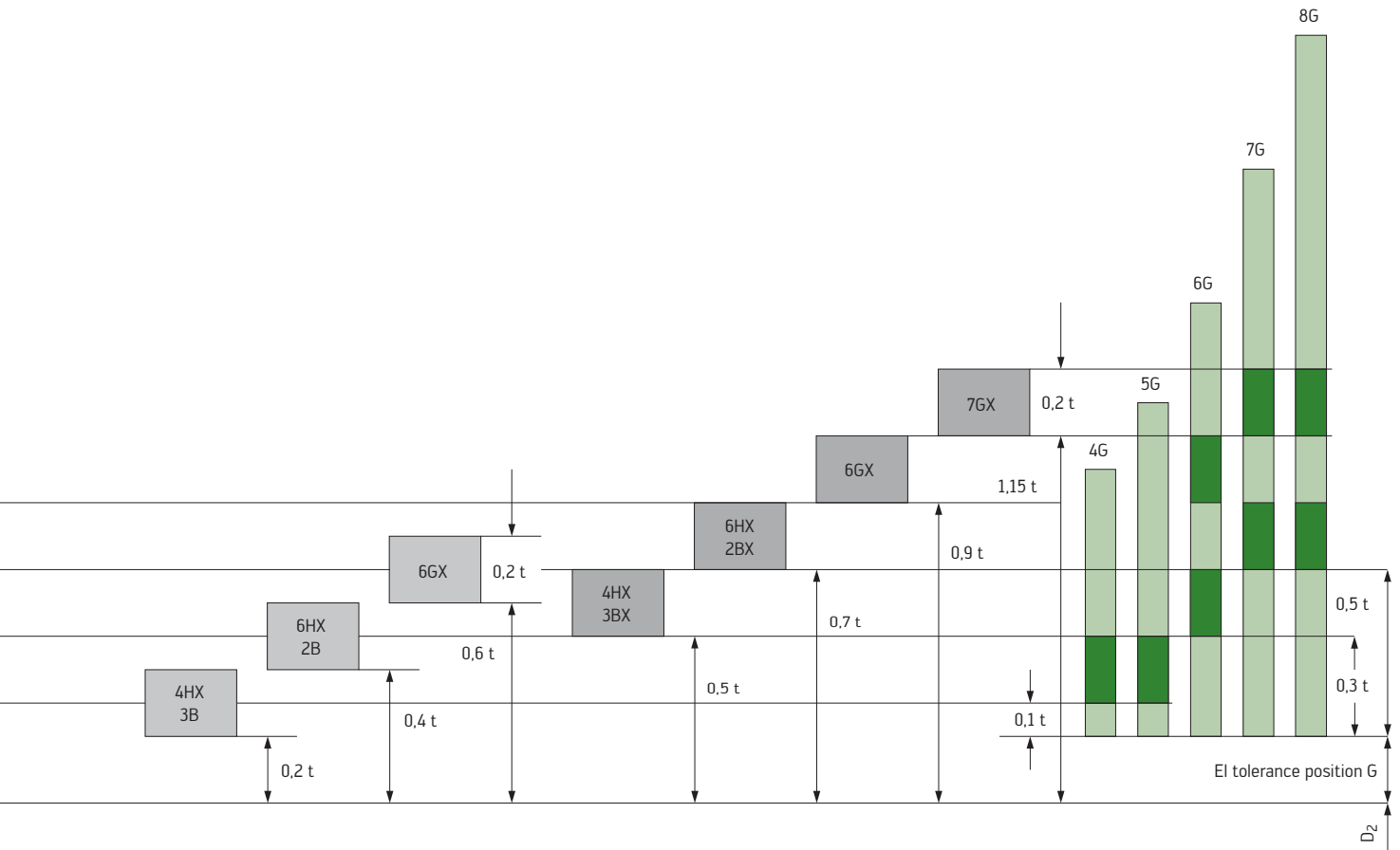


Example of 6HX thread former:
The thread former has a significantly higher pitch diameter than the tap. It is also in the X-position.

Tolerance classes

Tool tolerance class				Achievable tolerance classes					Technical application
ISO	DIN	ASME	Factory standard						
ISO 1	4H		4BX	ISO 1/4H	5H				Screw connection with minimum clearance
ISO 2	6H		6HX	4G	5G	ISO 2/6H			H-position: Normal screw connection G-position: For electroplated coatings
ISO 3	6G		6GX			ISO 3/6G	7H	8H	H-position: Screw connection with large clearance G-position: For electroplated coatings
	7G		7GX				7G	8G	To prevent distortion during heat treatment, for electroplated coatings
		3B	3BX	3B		2B			Screw connection with minimum clearance
		2B	2BX			2B			Normal screw connection

4G to 8G internal thread

**Note:**

All tolerance positions can be created with the same thread milling cutter. For more information, see the "Thread milling – CNC programming" section.

Thread tapping and forming calculation formulae

Tapping and thread forming calculation formulae:

Speed

$$n = \frac{v_c \times 1000}{D_N \times \pi} \quad [\text{rpm}]$$

Cutting speed

$$v_c = \frac{D_N \times \pi \times n}{1000} \quad [\text{m/min}]$$

Specific cutting force

$$k_c = k_{c1.1}^* \times \left[\frac{p^2}{2 \times Z \times L_f} \right]^{m_c^*}$$

Tap torque

$$M_d = \frac{k_c \times D_N \times p^2}{8000} \times \left[\frac{L_c}{D_N} \right]^\delta \times \left[1.12 - \frac{\gamma}{100} \right] \quad [\text{Nm}]$$

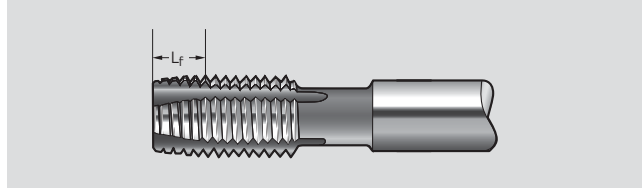
Thread former torque

$$M_d = \frac{k_c \times D_N \times p^2}{4000} \times \left[\frac{L_c}{D_N} \right]^{0.15} \quad [\text{Nm}]$$

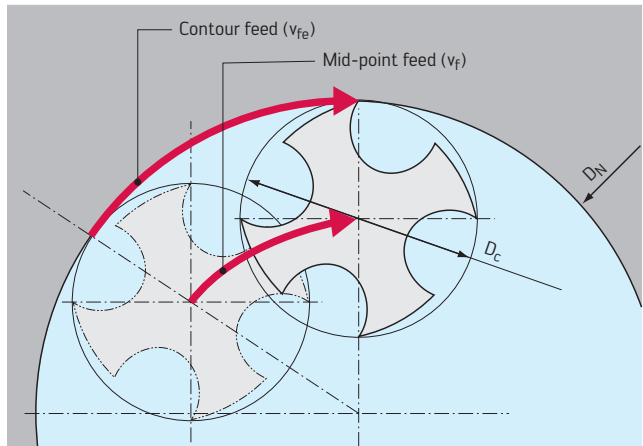
Power at the tap

$$P = \frac{M_d \times n}{9500 \times \eta} \quad [\text{kW}]$$

Taps and thread formers



Thread milling



Thread milling calculation formulae:

Speed

$$n = \frac{v_c \times 1000}{D_C \times \pi} \quad [\text{rpm}]$$

Cutting speed

$$v_c = \frac{D_C \times \pi \times n}{1000} \quad [\text{m/min}]$$

Contour feed

$$v_{fe} = n \times f_z \times z \quad [\text{mm/min}]$$

Mid-point feed for internal thread milling

$$v_f = \frac{v_{fe} (D_N - D_C)}{D_N} \quad [\text{mm/min}]$$

Mid-point feed for external thread milling

$$v_f = \frac{v_{fe} (D_N + D_C)}{D_N} \quad [\text{mm/min}]$$

Tool diameter	D_C	[mm]
Thread nominal diameter	D_N	[mm]
Cutting speed	v_c	[m/min]
Mid-point feed	v_f	[mm/min]
Contour feed	v_{fe}	[mm/min]
Speed	n	[rpm]
Thread pitch	P	[mm]
Number of flutes	z	
Thread depth	L_c	[mm]
Chamfer length	L_f	[mm]
Rake angle	γ	
Chip thickness	h_m	[mm]
Correction factor	δ (0.55 to 0.25)	
Specific cutting force	k_c	[N/mm ²]
Cutting force	F_c	[N]
Torque	M_d	[Nm]
Power at the tap	P	[kW]
Power requirement	P_{mot}	[kW]
Machine efficiency (< 1)	η	

*For m_c and $k_{c1.1}$, see table on page B 1173

Not applicable to multi-start, trapezoidal and conical taps

Cutting forces of Walter machining groups

Description	Tensile strength		Spec. cutting force	Increase value	Walter machining group
	min	max			
	R _m		k _{c1.1}	m _c	
	[N/mm²]		[N/mm²]		
Non-alloyed and low-alloy steels, C > 0.25%, low and medium tensile strength	350	750	1500	0,21	P1, P6
Non-alloyed and low-alloy steels, C > 0.55%, not heat-treated	400	900	1700	0,25	P2, P3, P4, P7, P14
Low and high-alloy steels, low heat treatment level	750	1100	2000	0,25	P5, P8, P11, P12
Stainless ferritic/martensitic steels, heat-treated	800	1400	2200	0,25	P15
Low and high-alloy steels, medium heat treatment level	1100	1400	2500	0,25	P9
Low and high-alloy steels, high heat treatment level	1200	1600	3000	0,25	P10, P13
Stainless, austenitic steels	400	900	1800	0,21	M1
Stainless, austenitic/ferritic steels + duplex	600	1000	2000	0,21	M3
Stainless, austenitic steels, precipitation hardened (PH steels)	700	1500	2400	0,21	M2
Grey cast iron + CGI + malleable cast iron, low tensile strength	200	400	800	0,28	K1, K3, K7
Ductile cast iron with low tensile strength + malleable cast iron with higher tensile strength	400	600	950	0,28	K2, K5
Grey cast iron with higher tensile strength	300	400	1200	0,28	K4,
Ductile cast iron with high tensile strength + ADI high tensile strength, unalloyed + alloyed	600	800	1400	0,28	K6
Wrought aluminium alloy, not hardened			350	0,25	N1
Wrought aluminium alloy, hardened			600	0,25	N2
Cast aluminium alloy < 12% Si, not hardened			600	0,25	N3
Cast aluminium alloy < 12% Si, hardened, cast aluminium alloy ≥ 12%			700	0,25	N4, N5
Pure copper, copper alloy (brass, bronze) with low tensile strength			550	0,25	N7, N8, N9
High tensile copper alloys, bronze with high strength			1000	0,25	N10
Heat-resistant alloys, iron-based, annealed			2400	0,25	S1
Heat-resistant alloys, iron-based, hardened			2500	0,25	S2
Pure titanium			1300	0,25	S6
Titanium alloys, alpha, alpha/beta and beta alloys			1500	0,25	S7, S8
Heat-resistant alloys, nickel-cobalt-based, annealed			2800	0,25	S3
Heat-resistant alloys, nickel-cobalt-based, hardened			2900	0,25	S4
Heat-resistant alloys, nickel-cobalt-based, cast			3000	0,25	S5
Hardened steels 46 – 52 HRC			3000	0,25	H1
Hardened steels 52 – 58 HRC			3700	0,25	H2
Hardened steels 58 – 62 HRC			4300	0,25	H3
Hardened cast iron 50 – 60 HRC			3500	0,25	H4
Thermoplasts and thermosetting plastics, without abrasive fillers			150	0,2	O1, O2
Fibre-reinforced plastics			300	0,3	O3, O4, O5
Graphite			400	0,25	O6

Comments:

The information consists of standard values and refers to a neutral cutting edge geometry.

The condition of the material and the cutting edge geometry considerably influences the cutting forces.

Material comparison table

Material group	Machining group						
		Germany					
		Mat. no. DIN	Mat. no. DIN EN	DIN	DIN EN	Manufacturer designation	
P	Building and construction steels						
	P1	1.0401		C 15	C15		
	P1	1.0402		C 22	C22		
	P2	1.0501		C 35	C35		
	P2	1.0503		C 45	C45		
	P4	1.0535		C 55	C55		
	P4 / P5	1.0601		C 60	C60		
	P6	1.0715		9 SMn 28	11SMn30		
	P6	1.0718		9 SMnPb 28	11SMnPb30		
	P6	1.0722		10 SPb 20	10SPb20		
	P6	1.0726		35 S 20	35S20		
	P6	1.0736		9 SMn 36	11SMn37		
	P6	1.0737		9 SMnPb 36	11SMnPb37	Ledloy	
	P7 / P10	1.0904			55Si7		
	P7 / P10	1.0961		60 SiCr 7	S340MGC, 60SiCr7		
	P1	1.1141		Ck 15	C15E		
	P7 / H2	1.1157		40 Mn 4	40Mn4		
	P1 / P3	1.1158		Ck 25	C25E		
	P7	1.1167		36 Mn 5	36Mn5		
	P7	1.1170		28 Mn 6	28Mn6		
	P2	1.1183		Cf 35	C35G		
	P2	1.1191		Ck 45	C45E		
	P4 / P5	1.1203		Ck 55	C55E		

	Great Britain		France	Italy	Sweden	Spain	Japan	USA
	B.S.	EN	AFNOR	UNI	SS	UNE	JIS	AISI / SAE
	080M15, 144917CS, 040A15, 080A15		C18RR, XC18	C15, C16, 1C15	1350	F.111	S 15 C, JIS S 15C	J 409 grade 1015
	040 A 15, 055 M 15, En 2, 22 CS, 22 HS, C 22, 070 M 20	2D, 2	AF42C20, XC25, 1C22	C20, C21	1450	1C22, F112	S 20 C, S22C, JIS S 20C	1020
	080A32, 080A35, 080M36, 1449.40CS		C35, 1C35, AF55C35	C35, 1C35	1572, 155	F.113	S 35 C	1035
	060A47, 080M46, 1449.50HS, 1449.50CS		1C45, AF 65 C 45	C45, 1C45	1650	F.114	JIS S 45C	1045
	070M55, 5770-50	9	C54, 1C55, AF 70 C 55	C55, 1C55	1655	F.115	S 55 C	1055
	060A62, 5770-60, 1449 60HS.CS		C60, 1C60, AF70C55	C60, 1C60		F.115	S 58 C	1060
	230M07		S250	CF9Mn28	1912	F.2111 - 11SMn28	JIS SUM22	1213
			S250Pb	CF9SMnPb28	1914	F.2112 - 11SMnPb28	SUM22L, SUM23L, SUM24L	12L13, 12L14, J 403 grade 12L14, J 1397 grade 12L14
	212M36		35MF6		1957	F.210G		J 403 grade 1141
	240M07	1B	S300	CF9SMn36		F.2113 - 12 SMn 35	SUM 25	J 403 grade 1213, J 403 grade 1215, J 1392 grade 1213
			S300Pb	CF9SMnPb36	1926	F.2114 - 12 SMnPb 35		J 403 grade 12L14, J 1397 grade 12L14
	250A53	45	55S7		2085	F.1440 - 56 Si 7		9255
	250A61		60SC7			F.1442 - 60 SiCr 8		9262
	040A15, 080M15, S14, CS17	32C			1370	F.1511 - C 16 k, F.1110 - C 15 k	S 15, S 15 CK, JIS S 15 C	1015
	150M36	15	35M5					1035, 1041
	070M26		2C25			F.1120 - C 25 k, C25K (F1120)	S 25 C, S 28 C	1025
	150M36	15 B	40M5		2120	F.1203 - 36 Mn5	SMn 438 (H), SCMn 3	1335
	150M28, 150M19, S92	14A, 14B	20M5	C28Mn		28Mn6	SCMn1	1027
	060A35, 080A35		XC38H1TS	C36, C38			S 35 C	1035
	080M46, 060A47		C45RR, XC42H1, XC45, 2C45, XC48, XC48H1		1672	F1140-C45k, F1142-C48k	S 45 C, S 48 C	1045
	060A57	9	XC55H1, 2C55, XC54		1655	F.1150 - C 55 k	S 55 C	1055

Material comparison table

Material group	Machining group	Germany					
		Mat. no. DIN	Mat. no. DIN EN	DIN	DIN EN	Manufacturer designation	
P	Building and construction steels (continued)						
	P2 / P3	1.1213		Cf 53	C53G		
	P4 / P5	1.1221		Ck 60	C60E		
	P4 / H1	1.1274		Ck 101	C101E, C100S		
	P11	1.3401		X 120 Mn 12	X120Mn12		
	P7 / H2	1.3505		100 Cr 6	100Cr6		
	P7	1.5415		15 Mo 3	16Mo3		
	P3	1.5423		16 Mo 5	16Mo5		
	P7	1.5622		14 Ni 6	14Ni6		
	P11	1.5662		X 8 Ni 9	X8Ni9		
	P11	1.5680		12 Ni 19	X12Ni5, 12Ni19		
	P9	1.5710		36 NiCr 6	36NiCr6		
	P7	1.5732		14 NiCr 10	14NiCr10		
	P7	1.5752		14 NiCr 14	15NiCr13		
	P7 / P9	1.6511		36 CrNiMo 4	36CrNiMo4		
	P7	1.6523		20NiCrMo2-2	21NiCrMo2		
	P9	1.6546		40 NiCrMo 22	40NiCrMo2-2, 40NiCrMo2KD		
	P7 / P9	1.6582		34 CrNiMo 6	34CrNiMo6		
	P7	1.6587		17 CrNiMo 8, 17 CrNiMo 6, 17 CrNiMo 6 BG	17CrNiMo6, 18CrNiMo7-6		
	P7	1.6657		14 NiCrMo 134	14NiCrMo13-4		
	P7	1.7015		15 Cr 3	15Cr2KD		

	Great Britain		France	Italy	Sweden	Spain	Japan	USA
	B.S.	EN	AFNOR	UNI	SS	UNE	JIS	AISI / SAE
	060A52, 070M55		XC48H1TS				S 50 C	1050, 1055
	060A62, 070M60, CS60		C60RR, XC60, 2C60		1665, 168	F.511, F.512	S 58 C	1060
	060A96, 5770-95, CS95		C100RR, C100, XC100, E 100		1870		SUP4	1095
			Z120M12, Z120Mn12		2183	F.82551-AM-X 120 Mn 12	SCMnH1, SCMnH11	
	BL3, 534A99, 535A99, 2S135, S135		Y100C6, 100C6, 100Cr6	100Cr6	2258	F.5230 100 Cr6, F.1310-100 Cr 6, F.131	SUJ 2, SUJ 4	L3, 52100
	1501-240, 1503-243B, 3606-243, 3059-243		15D3, 15Mo3	16Mo3 (KG KW)	2912	F.2601-16 Mo 3		ASTM A20, GR
	1503-245-420			16Mo5KG, 16Mo5KW		F.2602-16Mo5	SB 450 M, SB 480 M	4520
			16N6, 15N6, 15Ni6	14Ni6KG, 14Ni6KT		F.2641-15Ni6		ASTM A350 LF5
	1501-509;510, 3603-509LT, 1502-502-650, 509-690, 1503-509-690		Z8N9, 9Ni490	X10Ni9, X12Ni09		F.2645-X8 Ni09	SL9N53(60)	ASTM A353
			Z18N5, 5Ni390					2515, 2517
	640A35		35NC6				SNC 236	3135
			14NC11	16NiCr11		F.1540-15NiCr11	SNC 415 (H)	3415
	655M13, 655A12, 655H13	36A, 36B	14NC11, 12NC15, 14NC12, 13NiCr14				SNC 815 (H), SNC22, JIS SNC 815	3310, 3415, 9314
	816M40	110	40NCD3, 36CrNiMo4, 35NCD5	38NiCrMo7 (KB)		F.1280-35NiCrMo4		9840
	805H20, 805M20, 806M20	362	20NCD2, 22NCD2	20NiCrMo2	2506	F1552-20NiCrMo2, F1534-20NiCrMo3	SNCM 220 (H)	J 1268 grade 8620H, 8620
	311-Type7		40NCD2	40NiCrMo2 (KB)		F1204-40NiCrMo2, F1205-40NiCrMo2DF	SNCM 240	8740
	816M40, 817M40	24	35NCD6, 34CrNiMo6, 34CrNiMo8	35NiCrMo6KB	2541	F1272-40NiCrMo7, 34CrNiMo6	SNCM 447, JIS SNC M447	4340
	820A16		18NCD6	18NiCrMo7		F.1560-14 NiCrMo13, F.156		
	832H13, 832M13, S157	36C	16NCD13	15NiCrMo13		F1560-14NiCrMo13, F.1569-14NiCrMo131		
	523M15	206	12C3, 15Cr2, 18C3				SCr 415 (H)	5132

Material comparison table

Material group	Machining group	Germany					
		Mat. no. DIN	Mat. no. DIN EN	DIN	DIN EN	Manufacturer designation	
P	Building and construction steels (continued)						
	P7 / P8	1.7033		34 Cr 4	34Cr4		
	P7 / P9	1.7035		41 Cr 4	41Cr4		
	P9	1.7045		42 Cr 4	42Cr4		
	P7	1.7131		16 MnCr 5	16MnCr5		
	P7 / P9	1.7176		55 Cr 3	55Cr3		
	P8	1.7218		25 CrMo 4	25CrMo4		
	P7 / P9	1.7220		34 CrMo 4	34CrMo4		
	P7 / P9	1.7223		41 CrMo 4	41CrMo4		
	P7 / P9	1.7225		42 CrMo 4	42CrMo4		
	P7	1.7262		15 CrMo 5	15CrMo5		
	P7	1.7335		13 CrMo 4 4	13CrMo4-5		
	P7 / P10	1.7361		32 CrMo 12	32CrMo12		
	P7	1.7380		10 CrMo 9 10	10CrMo9-10		
	P7	1.7715		14 MoV 6 3	14MoV6-3		
	P7 / P9	1.8159		50 CrV 4	51CrV4		
	P7	1.8509		41 CrAlMo 7	41CrAlMo7	Nitalloy 135	
	P7 / P10	1.8523		39 CrMoV 13 9	40CrMoV13-9		

	Great Britain		France	Italy	Sweden	Spain	Japan	USA
	B.S.	EN	AFNOR	UNI	SS	UNE	JIS	AISI / SAE
	530A32, 530H32, 530M32		32C4, 34Cr4	34Cr4(KB)		F.8221-35 Cr 4, F.224	SCr 435 (H)	5132
	530M40, 530A40, 530H40	18	42C4, 41Cr4	41Cr4, 41Cr4KB		38Cr4, 38Cr41, 42Cr4, F.1202-42Cr4	SCR4, SCr 440 (H)	5140
	530A40	18	42C4, 42C4TS	41Cr4	2245	F1201, F1202, F1206, F.1202-42Cr4	SCR4, SCr 440 (H), SCr 440	5140, 5140H
	527M17, 590H17, 590M17		16MC5, 16MC4, 16MnCr5	16MnCr5	2511, 2173	F.1515-16 MnCr5, F.151		J 1268 grade 4118H, C5115
	525A58, 525A60, 525H60	48	55Cr3, 55C3	55Cr3	2253	F.1431-55 Cr3, F.143	SUP 9 (A)	5155
	1717CDS110, 708A25		25CD4, 25CrMo4	25CrMo4 (KB)	2225	F8372-AM26CrMo4, F8330-AM25CrMo4, F1256-30CrMo4-1, F.222	SCM420, SCM430, SCCrM1	4130
	708A37	19B	35CD4, 34CrMo4, 35CD4 / 34CrMo5	34CrMo4KB, 35CrMo4, 35CrMo4F	2234	F8331-AM34CrMo4, F8231-34CrMo4, F1250-35CrMo4, F1254-35CrMo4DF, F.125	SCM 432, SCCrM 3, SCM 435 H	4135, 4137, J 1268 grade 4135H
	708M40, 3111-5.1		42CD4TS	41CrMo4		F8332-AM42CrMo4, F8232-42CrMo4, F1252-40CrMo4	SCm 440, JIS SCM 440	4140
	708A42, 708M40, 709M40	19A	42CD4, 42CrMo4	38CrMo4KB, 42CrMo4, G40CrMo4	2244	F8332-AM42CrMo4, F8232-42CrMo4, F1252-40CrMo4	SCM 440 (H), SNB 7, JIS SCM 440	4140
			12CD4			F.1551-12CrMo4	SCM 415 (H)	
	620-440, 1503-620-440, 1502, 620-470, 3606-620, 620-540, 3604-620-440		15CD3.05, 15CD4.05	14CrMo3, 16CrMo3	2216	F.2631-14CrMo45	SFVA F 12	A387 grade 12CI2, ASTM A182
	722M24	40B	30CD12	32CrMo12	2240	F.124.A		
	3059-622-490, 3606-622, 1502-622, 3604-622, 622Gr.31, 622Gr.45		12CD9.10, 10CrMo9-10, 10CrMo9-11	12CrMo9 (KW KG), G14CrMo9, 10	2218	TU.H	SFVAF22A, BSCMV4, SCPH32-CF	A387 grade 22, A387 grade 22CI2, ASTM A182
	1503-660-460, 3604-660					F.2621-13 MoCrV6		
	735A50, 735A51, 735H51, 735M50	47	50CV4, 51CrV4, 50CrV4	50CrV4	2230	F.1430-51CrV4	SUP 10	6150
	905M39	41B	40CAD6.12	41CrAlMo7	2940	F.1740-41CrAlMo7	SACM 645, JIS SACM 645	Nitralloy 135
	897M39	40C						

Material comparison table

Material group	Machining group	Germany					
		Mat. no. DIN	Mat. no. DIN EN	DIN	DIN EN	Manufacturer designation	
P	Stainless and heat-resistant steels						
	P14 / P15	1.4000		X 7 Cr 13	X6Cr13		
	P14	1.4001		X 7 Cr 14	X7Cr14		
	P14 / P15	1.4006		X 10 Cr 13, X 12 Cr 13	X12Cr13, X10Cr13		
	P14	1.4016		X 6 Cr 17	X6Cr17		
	P15	1.4027		G-X 20 Cr 14	GX20Cr14		
	P15	1.4034		X 46 Cr 13	X46Cr13		
	P15	1.4057		X 20 CrNi 17 2	X19CrNi17-2, X17CrNi16-2		
	P14 / P15	1.4104		X 12 CrMoS 17	X14CrMoS17		
	P14	1.4113		X 6 CrMo 17 1	X6CrMo17-1		
	P15	1.4313		X 4 CrNi 13 4	X3CrNiMo13-4		
	P15	1.4718		X 45 CrSi 9 3	X45CrSi9-3-1		
	P14	1.4724		X 10 CrAl 13, X 10 CrAlSi 13	X10CrAlSi13, X10CrAl13		
	P14	1.4742		X 10 CrAl 18, X 10 CrAlSi 18	X10CrAl18, X10CrAlSi18		
	P15	1.4747		X 80 CrNiSi 20	X80CrNiSi20	Si1 XB	
	P14	1.4762		X 10 CrAl 24, X 10 CrAlSi 25	X10CrAl24, X10CrAlSi25		
	Tool steels						
	P4	1.1545		C 105 W 1	C105U		
	P4	1.1663		C 125 W	C125W, C125U		
	P7 / H2	1.2067		100 Cr 6	99Cr6, 102Cr6		
	P11 / H3	1.2080		X 210 Cr 12	X210Cr12		
	P11 / H1	1.2344		X 40 CrMoV 5 1	X40CrMoV5-1		
	P11 / H3	1.2363		X 100 CrMoV 5 1	X100CrMoV5-1		
	P7 / H2	1.2419		105 WCr 6	107WCr5, 105WCr6, 100WCr6		

	Great Britain		France	Italy	Sweden	Spain	Japan	USA
	B.S.	EN	AFNOR	UNI	SS	UNE	JIS	AISI / SAE
	403S17		Z6013, Z6Cr13, Z8C12	X6Cr13	2301	F.3110-X6 Cr13	SUS403, SUS410S, SUS429	403, 13/6
	403S17		Z3014, Z8C13FF	X6Cr13		F.8401-AM-X12 Cr13	SUS403, SUS410S, SUS429	403, 410S, 429
	410S21, 410C21, ANC1A		Z12C13, Z12Cr13, Z10C13	X12Cr13, X10Cr13	2302	F.3401-X12 Cr13	SUS 410, JIS SUS 410	410
	430S15, 430S17, 430S18	60	Z8C17, Z6Cr17	X8Cr17	2320	F.3113-X8 Cr17	SUS 430	430
	ANC1B, ANC1C, 420C24, 420C29		Z20C13M				SCS 2	
	420S45		Z40C14, Z40Cr14, Z38C13M, Z44C14	X40Cr14		F.3405-X46 Cr13		420
	431S29, 6S80, S80	57	Z15CN16.02	X16CrNi16	2321	F.3427-X15 CrNi16, F.313, F3427-X19CrNi172	SUS 431, JIS SUS 431	431
			Z10CF17	X10CrS17	2383	F3117-X10CrS17, F3413-X14CrMoS17	SUS 431, SUS430F	430F, J 405 grade 51435
	434S17		Z8CD17.01	X8CrMo17	2325	F3116-X6CrMo171	SUS 434	434
	425C11, 425C12		Z5CN13.4, Z4CND13.4M, Z6CN13-4, Z8CD17-01	GX6CrNi13 04	2385		SCS 5, SCS 6	CA6. 13/4
	401S45	52	Z45CS9	X45CrSi8		F.3220-X 4 ScrSi 09-03	SUH 1	HNv3
	403S17		Z10C13, Z13C13	X10CrAl12		F.13152-X 10 CrAl13		405
	430S15	60	Z10CAS18, Z12CAS18	X8Cr17		F.3153-X 10 CrAl 18	SUH 21	430
	443S65	59	Z80CSN20.02			F.3222-X 80CrSiNi20-02	SUH 4	HNv6
			Z10CAS24, Z12CAS25	X16Cr26	2322	F.3154-X 10 CrAl24	SUH 446	446
			C105E2U, Y1105	C100KU	1880	F515, F516	SK 3 (TC105)	W110
			Y2120			F.5123 C120		W112
	BL3, 534A99		100Cr6RR, 100C6, Y100C6		2258	F.5230 100 Cr6, F.1310 - 100 Cr6, F.131	SUJ 2, SUJ 4	L3, 52100, L1
	BD3		X200Cr12, Z200C12	X205Cr12KU		F.5212 X210 Cr12	SKD 1, SKS	D3
	BH13		X40CrMoV5, Z40CDV5	X40CrMoV511KU	2242	F.5318 X40 CrMoV5	SKD 61	H13, P20
	BA2		X100CrMoV5, Z100CDV5	X100CrMoV51KU	2260	F.5227 X100 CrMoV5	SKD 12, JIS SKD 12	A2, D2
			105WC13	107WCr5KU	2140	F.5233 105 WCr5, F.523	SKS 2, SKS 3, SKS 31	

Material comparison table

Material group	Machining group	Germany					
		Mat. no. DIN	Mat. no. DIN EN	DIN	DIN EN	Manufacturer designation	
P	Tool steels (continued)						
	P14 / H3	1.2436		X 210 CrW 12	X210CrW12-1, X210CrW12		
	P7 / H2	1.2542		45 WCrV 7	45WCrV8, 45WCrV7		
	P11 / P13	1.2581		X 30 WCrV 9 3	X30WCrV9-3		
	P14 / H3	1.2601		X 165 CrMoV 12	X165CrMoV12		
	P7 / P10 / H1	1.2713		55 NiCrMoV 6	55NiCrMoV6		
	P7 / H3	1.2833		100 V 1	100V1		
	P11 / H3	1.3243		S 6-5-2-5	HS6-5-2-5		
	P11 / H3	1.3255		S 18-1-2-5	HS18-1-2-5		
	P11 / H3	1.3343		S 6-5-2	HS6-5-2		
	P11 / H3	1.3348		S 2-9-2	HS2-9-2		
	P11 / H3	1.3355		S 18-0-1	HS18-0-1		
M	Stainless and heat-resistant steels						
	M1	1.4301		X 5 CrNi 18 10	X5CrNi18-10		
	M1	1.4305		X 10 CrNiS 18 9	X8CrNiS18-9		
	M1	1.4306		X 2 CrNi 19 11	X2CrNi19-11		
	M1	1.4308		G-X 6 CrNi 18 9	GX5CrNi19-10		
	M2	1.4310		X 12 CrNi 17 7	X9CrNi18-8, X10CrNi18-8		
	M1	1.4311		X 2 CrNiN 18 10	X2CrNiN18-10		
	M1	1.4401		X 5 CrNiMo 17 12 2	X5CrNiMo17-12-2, X4CrNiMo17-12-2, X5CrNiMo18-10		

	Great Britain		France	Italy	Sweden	Spain	Japan	USA
	B.S.	EN	AFNOR	UNI	SS	UNE	JIS	AISI / SAE
			X210CrW12-1, Z210CW12-01, Z 210 CW 12	X215CrW121KU	2312	F.5213 X210 CrW12, F.521		D6
	BS1		45WCrV8, 45WCrV20	45WCrV8KU	2710	F.5241 45 WCrSi 8, F.524, F524145WCrSi 8		S1
	BH21		X30WCrV9, Z30WCv9	X30WCrV93KU		F.5323 X30 WCrV9	SKD 5	01, H21
				X165CrMoW12KU	2310	F.5211 X160 CrMoV12		
	BH224					F.528, F520S		L6
	BW2		C105E2UV1, Y1105V, 100V2	102V2KU			SKS 43	W210
	BM35		Z85WDCV06- 05-05-04-02, Z90WDCV06- 05-05-04-02	HS6-5-2-5	2723	F.5613 6-5-2-5	SKH 55	S7, M35
	BT4		Z80WKCv18- 05-04-01	HS18-1-1-5		F.5530 18-1-1-5	SKH 3	T4
	BM2		Z85WDCV06- 05-04-02	HS6-5-2-5	2722	F.5603 6-5-2	SKH 51	M2
			Z100DCWV09- 04-02-02	HS2-9-2	2782	F.5607 2-9-2		M7
	BT1		Z80WCV18-04-01	HS18-0-1		F.5520 18-0-1	SKH 2	T1
	304S15, 304S16, 304S31, 304S11, 304S17, LW21, LWCF21	58E	Z4CN19-10FF, Z5CN17-08, Z6CN18-09, Z7CN18-09	X5CrNi18 10	2332, 233	F.3451-X5 CrNi18-10, F.314, F.3504-X6CrNi19 10, F3504-X5CrNi1810	SUS 304	304, 304H
	303S21, 303S22, 303S31	58M	Z10CNF18.09, Z8CNF18-09	X10CrNiS18 09	2346	F.3508-X10CrNiS18-09	SUS 303, JIS SUS 303	J 405 grade 30303, 303
	304S11, LW20, LWCF20, S536, T74, 304C12 (LT196), 305S11		Z1CN18-12, Z2CN18-10, Z3CN19.10M, Z3CN18-10, Z3CN19-11, Z3CN19-11FF	X3CrNi18 11, X2CrNi18 11, GX2CrNi19 10	2352	F.3503-X 2CrNi19-10, F3503-X 2CrNi18-10	JIS SCS 19, JIS SUS 304L	304L
	304C15, 304C15 (LT196)		Z6CN18.10M				SCS 13	
	301S21, 301S22, 302S26		Z12CN17.07, Z12CN18.07, Z11CN17-08, Z11CN18-08, Z12CN18-09	X12CrNi17 07	2331	F.3517-X12CrNi17 07	SUS 301	301
	304S62		Z3CN18-07Az, Z3CN18-10AZ	X2CrNi18 11	2371	F3541-X2CrNi1810	SUS 304 LN	304LN
	316S13, 316S17, 316S19, 316S31, 316S33, 316S16		Z6CND17.11, Z3CD17-11-01, Z6CND17-11, Z6CND17-11-02FF, Z7CND17-11-02, Z7CND17-12-02	X5CrNiMo17 12	2347	F.3543-X5CrNiMo17-12, F.3543-X6 CrNiMo17- 12-03, F3543-X5CrNiMo17-122	SUS 316	316

Material comparison table

Material group	Machining group	Germany					
		Mat. no. DIN	Mat. no. DIN EN	DIN	DIN EN	Manufacturer designation	
M	Stainless and heat-resistant steels (continued)						
	M1	1.4408		G-X 6 CrNiMo 18 10	GX5CrNiMo19-11-2		
	M1	1.4429		X 2 CrNiMoN 17 13 3	X2CrNiMoN17-13-3		
	M1	1.4435		X 2 CrNiMo 18 14 3, X 2 CrNiMo 18 12	X2CrNiMo18-14-3		
	M1	1.4438		X 2 CrNiMo 18 16 4	X2CrNiMo18-15-4		
	M1	1.4460		X 4 CrNiMoN 27 5 2	X3CrNiMoN27-5-2		
	M1	1.4541		X 6 CrNiTi 18 10	X6CrNiTi18-10		
	M1	1.4550		X 6 CrNiNb 18 10	X6CrNiNb18-10		
	M1	1.4571		X 6 CrNiMoTi 17 12 2	X6CrNiMoTi17-12-2		
	M1	DIN 1.4565, 1.4581		G-X 5 CrNiMiNb 18 10	GX5CrNiMoNb19-11-2		
	M1	1.4583		X 10 CrNiMoNb 18 12	X10CrNiMoNb18-12		
	M1	1.4828		X 15 CrNiSi 20 12	X15CrNiSi20-12		
	M2	1.4871		X 53 CrMnNiN 21 9	X53CrMnNiN21-9		
	M1	1.4878		X 12 CrNiTi 18 9	X12CrNiTi18-9, X10CrNiTi18-10		
	Heat-resistant alloys, Fe-based						
	M1	1.4558		X 2 NiCrAlTi 32 20	X2NiCrAlTi32-20		
	M1	1.4563		X 1 NiCrMoCu 31 27 4	X1NiCrMoCu31-27-4		
	M1	1.4864		X 12 NiCrSi 36 16	X12NiCrSi36-16, X12NiCrSi35-16	Incoloy DS	
	M1	1.4958		X 5 NiCrAlTi31-20	X5NiCrAlTi31-20		
	M1	1.4977			X 40 CoCrNi 20 20		

	Great Britain		France	Italy	Sweden	Spain	Japan	USA
	B.S.	EN	AFNOR	UNI	SS	UNE	JIS	AISI/ SAE
	316C16, 316C16 (LT196), ANC4B					F.8414-AM-X7 CrNiMo20 10	SCS 14	
	316S62, 316S63		Z2CND17.13Az	X2CrNiMoN17 13	2375	F3543- X2CrNiMoN17133	SUS 316 LN	316LN
	316S11, 316S13, 316S14, 316S31, LW22, LWCF22, 316S12		Z2CND17.13, Z3CND17-12-03, Z3CND18-14-03	X2CrNiMo17 13	2353	F.3533-X2 CrNiMo 17- 12-03, F.3534-X6 CrNiMo 17- 12-03		316L
	317S12		Z2CND19.15, Z2CND19-15-04, Z3CND19-15-04	X2CrNiMo18 16	2367	F3539-X2CrNiMo18164	SUS 317 L	317L
			Z3CND25-07Az, Z5CND27-05Az		2324	F3309-X8CrNiMo27-05, F3552-X8CrNiMo266	SUS 329 J1	329
	321S12, 321S31, 321S51 (1010, 1105) LW24, LWCF24	58B, 58C	Z6CNT18.10	X6CrNiTi18 11	2337	F.3553-X7 CrNiTi 18-11, F.3523-X 6 CrNiTi 18-11, 09 Ch 18N10T, F3523-X6CrNiTi1810	SUS 321, JIS SUS 321	321, 15/5 PH, 17/4 PH
	347S20, 347S31, 347S51, ANC3B	58F, 58G	Z6CNNb18.10	X6CrNiNb18 11, X8CrNiNb18 11	2338	F.3552-X 7 CrNiNb 18-11, F.3524-X 67 CrNiNb 18-11, F3524-X6CrNiNb1810	SUS 347	347, 13/8 MO
	320S31, 320S17, 320S18	58J	Z6CNDT17.12	X6CrNiMoTi17 12	2350	F.3552-X 6 CrNiMoTi17-12-03, F3535- X6CrNiMoTi17122	SUS 316 Ti	316Ti, 326Ti
	318C17, ANC4C		Z4CNDNb18.12M	GX6crNiMoNb20 11			SCS 22	Nitronic 50.60
				X6CrNiMoNb17 13				
	309S24		Z15CNS20.12, Z17CNS20-12, Z9CN24-13	X16CrNi23 14		F3312-X15CrNiSi20-12	SUH 309	309
	349S54		Z52CMN21.09, Z53CMNS21-09Az, Z53CMN21-09Az	X53CrMnNiN21 9		F.3217-X53 CrMnNiN 21-09	SUH 35, SUH 36	EV8, 2205 Duplex
	321S20, 321S51	58B, 58C	T6CNT18.12 (B), Z6CNT18-10		2337	F.3523-X 6CrNiTi 18 11	SUS 321	321
								N08800 Incoloy 800
								N08028 Alloy 28
	NA17		Z12NCS37.18, Z12NCS35.16, Z20NCS33-16			F.3313-X12 CrNi 36-16	SUH 330	N08830 Alloy 330
			Z 42 CNKDOWNb					

Material comparison table

Material group	Machining group	Germany					
		Mat. no. DIN	Mat. no. DIN EN	DIN	DIN EN	Manufacturer designation	
K	Grey cast iron						
	K3	0.6010	EN-JL1010	GG-10, GG 10	EN-GJL-100		
	K3	0.6015	EN-JL1020	GG-15, GG 15	EN-GJL-150		
	K3	0.6020	EN-JL1030	GG-20, GG 20	EN-GJL-200		
	K3	0.6025	EN-JL1040	GG-25, GG 25	EN-GJL-250		
	K4	0.6030	EN-JL1050	GG-30, GG 30	EN-GJL-300		
	K4	0.6035	EN-JL1060	GG-35, GG 35	EN-GJL-350		
	K4	0.6040		GG-40, GG 40	EN-GJL-400		
	K4	0.6660		GGL-NiCr 20 2			
	K4			GG-26Cr, GG 26Cr	EN-GJL-260 Cr		
	K7			GGV 45	EN-GJV-450		
	Ductile cast iron						
	K5	0.7040	EN-JS1030	GGG-40	EN-GJS-400-15		
	K6	0.7050	EN-JS1050	GGG-50	EN-GJS-500-7		
	K6	0.7060	EN-JS1060, EN-JS 1092	GGG-60	EN-GJS-600-3, EN-GJS-600-3U		
	K6	0.7070	EN-JS1070, EN-JS 1102	GGG-70	EN-GJS-700-2, EN-GJS-700-2U		
	Malleable cast iron						
	K1	0.8035	EN-JM 1010	GTW-35, GTW-35-04	GTW-35-04, EN-GJMW-350-4		
	K1	0.8040	EN-JM 1030	GTW-40-05, GTW-40	EN-GJMW-400-5, GTW-40-05		
	K1	0.8045	EN-JM 1040	GTW-45-07, GTW-45	EN-GJMW-450-7		
	K1	0.8135	EN-JM 1130	GTS-35-10, GTS-35	EN-GJMB 350-10		
	K1	0.8145	EN-JM 1140	GTS-45-06, GTS-45	EN-GJMB 450-6, GTS-45-06		
	K1	0.8155	EN-JM 1160	GTS-55-04, GTS-55	EN-GJMB 550-4, GTS-55-04		
	K2	0.8165	EN-JM 1180	GTS 65-02, GTS-65	EN-GJMB 650-2, GTS-65-02		
	K2	0.8170	EN-JM 1190	GTS 70-02, GTS-70	EN-GJMB 700-2, GTS-70-02		

	Great Britain		France	Italy	Sweden	Spain	Japan	USA
	B.S.	EN	AFNOR	UNI	SS	UNE	JIS	AISI / SAE
			Ft10D, FGL100	G10	0110	FG 10	FC 100, FC10	ASTM A-48-76
	Grade 150		Ft15D, FGL150	G15	0115	FG 15	FC 150	NO 20B
	Grade 220		Ft20D, FGL200	G20	0120	FG 20	FC 200, FC20	NO 30B
	Grade 260		Ft25D, FGL250	G25	0125	FG 25	FC25, FC 250	NO 35B
	Grade 300		Ft30D, FGL300	G30	0130	FG 30	FC 300	NO 40B
	Grade 350		Ft35D, FGL350	G35	0135	FG 35	FC 350	NO 55B
	Grade 400		Ft40D, FGL400		0140			
	L-NiCr20 2		L-NC 20 2		0523			
	420 / 12		FGS 400-12	GS400-12	0717		FCD 400, FCD40	60/40/18
	500 / 7		FGS 500-7	GS500-7	0727		FCD 500, FCD50	70/50/05
	600 / 3		FGS 600-3	GS600-3	0732		FCD 600, FCD60	80/55/06
	700 / 2		FGS 700-2	GS700-2	0737		FCD 700, FCD70	100/70/03 120/90/02
	W 35-04		MB 35-7				FCMW 330	
	W 410 / 4		MB 40-10				FCMW 350	
	45-07		MB 45-7				FCMWP 440	
	B 340 / 12		MN 35-10		0815		FCMB 340	32510
	P 440 / 7, P 45-06		MP 50-5		0854			40010
	P 540 / 5, P 55-04		MP 60-3		0856			50005
	P 65-02				0862			60004
	P 70-02		MP 70-2		0862			70003

Material comparison table

Material group	Machining group	Germany					
		Mat. no. DIN	Mat. no. DIN EN	DIN	DIN EN	Manufacturer designation	
N	Aluminium alloys						
	N1	3.0255	EN AW-1050A	Al99.5	Al99.5		
	N4	3.1371	EN AC-21000	G-AlCu4TiMg	G-AlCu4TiMg		
	N2	3.1655	EN AW-2011	AlCuBiPb	AlCu6BiPb		
	N2	3.1734		Y-Alloy	AlCu4Mg1.5Ni2, WL 3.1734		
	N4	3.2371	EN AC-42100	G-AlSi7Mg	G-AlSi7Mg, AlSi7Mg		
	N4	3.2373	EN AC-43300	G-AlSi9Mg	G-AlSi9Mg, AlSi9Mg		
	N4	3.2381	EN AC-43000	G-AlSi10Mg	G-AlSi10Mg, AlSi10Mg		
	N4	3.2382	EN AC-43400	GD-AlSi10Mg	AlSi10Mg(Fe)		
	N4	3.2383	EN AC-43200	G-AlSi10MgCu	G-AlSi10MgCu, AlSi10Mg (Cu)		
	N3	3.2581	EN AC-44200	G-AlSi12	G-AlSi12, AlSi12		
	N3	3.2582	EN AC-44300	GD-AlSi12	GD-AlSi12, AlSi12 (Fe)		
	N3	3.2583	EN AC-47000	G-AlSi12 (Cu)	G-AlSi12 (Cu)		
	N2	3.3315	EN AW-5005A	AlMg1	AlMg1C		
	N3	3.3561	EN AC-51300	G-AlMg5	G-AlMg5		
	N2	3.4345	EN AW-7022	AlZnMgCu0.5	AlZnMgCu0.5		
	N4	DIN 3.3211					
	N4	DIN 3.4365					
	Copper alloys						
	N7	2.0240	CW502L	CuZn15	CuZn15	Medium red tombac, gold tombac	
	N7	2.0265	CW505L	CuZn30	CuZn30	Half tombac, soldered brass, cartridge brass, polished brass, metarsic	
	N7	2.0321	CW508L	CuZn37	CuZn37	Pressed brass, etching quality, tuned brass, soft brass, stamped brass	
	N7	2.0592	CC765S	G-CuZn35Al1, GK-CuZn35Al1, GZ-CuZn35Al1	CuZn35Mn2Al1Fe1-C		
	N7	2.0596	CC764S	G-CuZn34Al2, GK-CuZn34Al2, GZ-CuZn34Al2	CuZn34Mn3Al2Fe1-C		
	N7	2.0966	CW307G	CuAl10Ni5Fe4	CuAl10Ni5Fe4		
	N7	2.0975	CC333G	G-CuAl11Ni, G-CuAl10Ni	G-CuAl11Ni		
	N7	2.1050	CC480K	G-CuSn10Zn	CuSn10-C		

	Great Britain		France	Italy	Sweden	Spain	Japan	USA
	B.S.	EN	AFNOR	UNI	SS	UNE	JIS	AISI / SAE
	1B		A5	4507	4007	L-3051	A1x1, A1050	1050A
			A-U5GT			L-2140	AC1B	B26
	FC1		A-U5PbBi	6362	4355	L-3182	A2011	2011
	LM14		A-U4NT	3045		L-2150	AC5A	
	2L99, LM25		A-S7G0.3	7257	4244	L-2651	AC4C, JIS AC4 CH (AL 9)	B25
			A7-S10G	3051	4253		AC4A, JIS AC4 A (AL 4)	A13560
	LM9		A-S10G	3051	4253	L-2560, L-2561	JIS AC4 A (AL 4V)	A13600
	LM9		A-S10G	3051	4253	L-2560, L-2561	AC4A	
			A-S9GU				JIS ADC3 (AL 4)	A360.2
	LM6		A-S13	4514	4261	L-2520, L-2521	AC3A	A413.2
	LM6, LM20		A-S13, A-S12	4514, G-AlSi13	4261	L-2520, 21	AC3A	A413.0
	LM20		A-S12U	3048	4260	L-2530	ADC1 (AK 12), AC3A (AL 12)	413.1
	N41		A-G0, 6	5764	4106	L-3350	A2x8, A5005	5005A
	N6, LM5		A-G6	3058	4146	L-3320	JIS AC7A (AL28)	5056A, 514.1
			A-Z5GU0.6					
								6061-T6
								7075-T6
	CZ 102		CuZn15				C2300	C23000
	CZ 106		CuZn30				C2600	C26000
	CZ 108		CuZn37				C2720	C27400
	HTB 1							C86500
								C86200
	CA 104		CuAl9Ni5Fe3Mn, U-A10N					C63000
	AB2		CuAl11Ni5Fe	G-CuAl11Fe4Ni4				B-148-52
	G1, CT1							C90700

Material comparison table

Material group	Machining group	Germany					
		Mat. no. DIN	Mat. no. DIN EN	DIN	DIN EN	Manufacturer designation	
N	Copper alloys (continued)						
	N7	2.1052	CC483K	G-CuSn12, GZ-CuSn12, GC-CuSn12	CuSn12-C		
	N9	2.1090	CC493K	G-CuSn7ZnPb, GZ-CuSn7ZnPb, GC-CuSn7ZnPb	CuSn7Zn4Pb7-C	Rotguss 7	
	N9	2.1096	CC491K	G-CuSn5ZnPb	CuSn5Zn5Pb5-C	Rotguss 5	
	N9	2.1098	CC490K	G-CuSn2ZnPb	CuSn3Zn8Pb5-C	Alloy 5A	
	N9	2.1176	CC495K	G-CuPb10Sn, GZ-CuPb10Sn, GC-CuPb10Sn	CuSn10Pb10-C		
	N9	2.1182	CC496K	G-CuPb15Sn, GZ-CuPb15Sn, GC-CuPb15Sn	CuSn7Pb15-C		
	N9	2.1188	CC497K	G-CuPb20Sn	CuSn5Pb20-C		
	N7	2.1293	CW106C	CuCrZr	CuCr1Zr		
	N7			CuAl6.5Fe2.5Sn0.25		AMPCO 8	
	N7					AMPCO 6	
	N10			CuAl13Fe4.5		AMPCO 21	
	N10					AMPCO 26	
	Magnesium-based alloys						
	N6	3.5101	EN-MC35110	G-MgZn 4 SE 1 Zr 1	EN-MCMgZn4RE1Zr, G-MgZn4SE1Zr1		
	N6	3.5103	EN-MC65120	G-MgSE 3 Zn 2 Zr 1	EN-MCMgRE3Zn2Zr, G-MgSE3Zn2Zr1		
	N6	3.5106	EN-MC65210	G-MgAg 3 SE 2 Zr 1	EN-MCMgRE2Ag2Zr, G-MgAg3SE2Zr1		
	N6	3.5161		MgZn6Zr, MgZn 6 Zr F 29	MgZn6Zr, MgZn6Zr F29		
	N6	3.5200		MgMn2	MgMn2		
	N6	3.5312		MgAl3Zn	MgAl3Zn		
	N6	3.5470	EN-MC21320	MgAl4Si1	EN-MCMgAl4Si		
	N6	3.5612		MgAl6Zn	MgAl6Zn		
	N6	3.5632	EN-MC21150	G-MgAl 6 Zn 3	G-MgAl6Zn3	AZ63	
	N6	3.5662		G-MgAl 6	G-MgAl6		
	N6	3.5812	EN-MC21110	G-MgAl 8 Zn 1	G-MgAl8Zn1	AZ81 hp	
	N6	3.5912	EN-MC21120	GD-MgAl 9 Zn 1	GD-MgAl9Zn1	AZ91	

	Great Britain		France	Italy	Sweden	Spain	Japan	USA
	B.S.	EN	AFNOR	UNI	SS	UNE	JIS	AISI / SAE
	Pb2		A53-707, CuSn12					Amcoloy 712, B505
			CuSn7Pb6Zn4					C93200
	LG2		CuPb5Sn5Zn5					C83600
	LG1							
	LB2		CuPb10Sn10					C93700
	LB1							C93800
	LB5		CuPb20Sn5					C94100
	CC 102			CuCrZr				C18200
								AMPCO 8
								AMPCO 6
								AMPCO 21
								AMPCO 26
	RZ5, MAG5, MAG9, TZ6		G-Z4TR, ZH62					ZE41
	ZRE1, MAG6		G-TR3Z2					EZ33
	MSR, QE22		G-Ag2, 5					QE22
	ZW1, ZW3, ZW6, ZW21, MAG 161, MAG 131, MAG 141, MAG 151							M1
	MAG 101, AM503		G-M2					
	AZ31, MAG 111		G-A3Z1, AZ31					52, 510
			G-A4S1					
	MAG121, AZM		G-A6Z1, AZ61					520, 531
			AZ63					
	MAG1, MAG2, AZ80, AZ81, A8		G-A9, AZ81	AZ81 hp			AZ81 hp	AZ81
	AZ91, MAG3, MAG7		G-A9Z1, AZ91	AZ91 hp				HK31

Material comparison table

Material group	Machining group	Germany					
		Mat. no. DIN	Mat. no. DIN EN	DIN	DIN EN	Manufacturer designation	
S	Titanium and titanium alloys						
	S6	3.7025		Ti 1	Ti 99.8	TitaniumGrade1	
	S7	3.7115.1		TiAl 5 Sn 2	TiAl5Sn2.5		
	S6	3.7124		TiCu2	TiCu2		
	S7	3.7164, 3.7165		TiAl 6 V 4	TiAl6V4	TitaniumGrade5	
	Ni/Co-based heat-resistant alloys						
	S3	2.4360		NiCu30Fe	NiCu30	Monel 400	
	S4	2.4375		NiCu30Al	NiCu30Al3Ti	Monel K500	
	S3	2.4630		NiCr20Ti		Nimonic 75	
	S3	2.4642		NiCr30Fe		Inconel 690, Alloy 690	
	S4	2.4668		NiCr19Fe19NbMo, NiCr19Fe19Nb5Mo3, NiCr19NbMo	NiCr19Nb5Mo3	Inconel 718, Udimet 630	
	S4	2.4669		NiCr15Fe7TiAl, Alloy X-750	NiCr15Fe7Ti2Al	Inconel X-750, Alloy X-750	
	S3	2.4856		NiCr22Mo9Nb, Alloy 625	NiCr22Mo9Nb	Inconel 625	
	S3	2.4858		NiCr21Mo, Alloy 825	NiFe30Cr21Mo3	Incoloy 825	
	S4	DIN 2.4698					
	S4	DIN 2.4654					
H	Hardened cast iron						
	H4	0.9640		G-X300CrMoNi1521	GX300CrMoNi15-2-1		
	H4	0.9645		G-X260CrMoNi2021	GX260CrMoNi20-2-1		
	H4	0.9650		G-X260Cr27	GX260Cr27		
	H4	0.9655		G-X300CrMo271	GX300CrMo27-1		
	Chilled cast iron						
	H4	0.9620		G-X260NiCr42	GX260NiCr42	Ni-Hard 2	
	H4	0.9625		G-X330NiCr42	GX330NiCr42	Ni-Hard 1	
B9	H4	0.9630		G-X300CrNiSi952	GX300CrNiSi952	Ni-Hard 4	
	H4	0.9635		G-X300CrMo153	GX300CrMo15-3		

	Great Britain		France	Italy	Sweden	Spain	Japan	USA
	B.S.	EN	AFNOR	UNI	SS	UNE	JIS	AISI / SAE
	TA.1		T-35			Ti-P01		R2050
								R54620
	TA.21, TA.22, TA.23, TA.24, TA.52, TA.53, TA.54, TA.55, TA.58		T-U2			Ti-P11		
	TA.10, TA.11, TA.12, TA.13, TA.28, TA.56		T-A6V			Ti-P63		4911, 4928, 4935, 4954, 4965, 4967, 6AL4V
	3072-76, NA13		NU30					Monel 400
	3072-76, HC202, 3146, Na18							AMS 4676, Monel K500
	HR5, 703 B, 203-4		NC 20 T					Nitronic 75, Nimonic 90/120
								Inconel 690
	HR 8		NC 19 FeNb					Inconel 718
	HR 505		NC 15 FeTNb					5542G, Inconel X-750
			NC 22 FeDNB					Incoloy 825
	3072-76		NC 21 FeDU					
								Hastelloy C
								Waspaloy
	Grade3A, Grade3B, BS4844							
	Grade3C							
	Grade3D				0466			A532111A 25% CR
	Grade3E							A532111A 25% CR
	Grade2A, BS4844 (1986) 2A				0512			Ni hard 2
	Grade2B, BS4844 (1986) 2B				0513			Ni hard 1
	Grade2C, Grade2D, Grade2E, BS4844 (1986) 2E				0457			Ni hard 4
	Grade3A,B, Grade3B							

Material comparison table

Material group	Machining group	Germany					
		Mat. no. DIN	Mat. no. DIN EN	DIN	DIN EN	Manufacturer designation	
0	Thermosetting plastic						
	02					EP, epoxide, epoxy	
	02					Bakelite	
	02					Pertinax	
	02					Resitex	
	Thermoplastic						
	01					PMMA, polymethyl metacrylate, Plexiglass, acrylic glass	
	01					PC, polycarbonate, Makrolon	
	01					PA, polyacrylamide	

	Great Britain		France	Italy	Sweden	Spain	Japan	USA
	B.S.	EN	AFNOR	UNI	SS	UNE	JIS	AISI / SAE
								Epoxy, Bakelite
								Phenolic
								Phenolic w/glass
								Resitex
								Plexiglas, acrylic, polycarbonate
								UHMW
								Acetal plastics, Delrin, Celcon, Teflon, nylon

Hardness comparison table

Tensile strength, Brinell, Vickers and Rockwell hardness (extract from DIN 50150)

Tensile strength R_m N/mm ²	Vickers hardness HV	Brinell hardness HB	Rockwell hardness HRC
255	80	76,0	
270	85	80,7	
285	90	85,5	
305	95	90,2	
320	100	95,0	
335	105	99,8	
350	110	105	
370	115	109	
385	120	114	
400	125	119	
415	130	124	
430	135	128	
450	140	133	
465	145	138	
480	150	143	
495	155	147	
510	160	152	
530	165	156	
545	170	162	
560	175	166	
575	180	171	
595	185	176	
610	190	181	
625	195	185	
640	200	190	
660	205	195	
675	210	199	
690	215	204	
705	220	209	
720	225	214	
740	230	219	
755	235	223	
770	240	228	20,3
785	245	233	21,3
800	250	238	22,2
820	255	242	23,1
835	260	247	24,0
850	265	252	24,8
865	270	257	25,6
880	275	261	26,4
900	280	266	27,1
915	285	271	27,8
930	290	276	28,5
950	295	280	29,2
965	300	285	29,8
995	310	295	31,0
1030	320	304	32,2
1060	330	314	33,3
1095	340	323	34,4
1125	350	333	35,5
1155	360	342	36,6
1190	370	352	37,7
1220	380	361	38,8
1255	390	371	39,8
1290	400	380	40,8
1320	410	390	41,8
1350	420	399	42,7
1385	430	409	43,6

Tensile strength R_m N/mm ²	Vickers hardness HV	Brinell hardness HB	Rockwell hardness HRC
1420	440	418	44,5
1455	450	428	45,3
1485	460	437	46,1
1520	470	447	46,9
1555	480	(456)	47,7
1595	490	(466)	48,4
1630	500	(475)	49,1
1665	510	(485)	49,8
1700	520	(494)	50,5
1740	530	(504)	51,1
1775	540	(513)	51,7
1810	550	(523)	52,3
1845	560	(532)	53,0
1880	570	(542)	53,6
1920	580	(551)	54,1
1955	590	(561)	54,7
1995	600	(570)	55,2
2030	610	(580)	55,7
2070	620	(589)	56,3
2105	630	(599)	56,8
2145	640	(608)	57,3
2180	650	(618)	57,8
	660		58,3
	670		58,8
	680		59,2
	690		59,7
	700		60,1
	720		61,0
	740		61,8
	760		62,5
	780		63,3
	800		64,0
	820		64,7
	840		65,3
	860		65,9
	880		66,4
	900		67,0
	920		67,5
	940		68,0

Any hardness values converted on the basis of this table will be approximate only.
See DIN 50150.

Values in brackets are theoretically calculated values.

Material property	Unit/test method	Symbol
Tensile strength	N/mm ²	R_m
Vickers hardness	Diamond pyramid 136° Testing force $F \geq 98$ N	HV
Brinell hardness Calculated from: HB = 0.95 × HV	$0.102 \times F/D^2 = 30$ N/mm ² F = testing force in N D = sphere diameter in mm	HB
Rockwell hardness C	Diamond cone 120° Overall testing force 1471 ± 9 N	HRC

ISO tolerances

Nominal size range in mm	Tolerances* for external dimensions																
	d11	e8	h5	h6	h7	h8	h9	h10	h11	h12	js14	js16	k6	k10	k11	k12	m7
> 3	-20 -80	-14 -28	0 -4	0 -6	0 -10	0 -14	0 -25	0 -40	0 -60	0 -100	+125 -125	+300 -300	+6 0	+40 0	+60 0	+100 0	+12 +2
> 3 ≤ 6	-30 -105	-20 -38	0 -5	0 -8	0 -12	0 -18	0 -30	0 -48	0 -75	0 -120	+150 -150	+375 -375	+9 +1	+48 0	+75 0	+120 0	+16 +4
> 6 ≤ 10	-40 -130	-25 -47	0 -6	0 -9	0 -15	0 -22	0 -36	0 -58	0 -90	0 -150	+180 -180	+450 -450	+10 +1	+58 0	+90 0	+150 0	+21 +6
> 10 ≤ 18	-50 -160	-32 -59	0 -8	0 -11	0 -18	0 -27	0 -43	0 -70	0 -110	0 -180	+215 -215	+550 -550	+12 +1	+70 0	+110 0	+180 0	+25 +7
> 18 ≤ 30	-65 -195	-40 -73	0 -9	0 -13	0 -21	0 -33	0 -52	0 -84	0 -130	0 -210	+260 -260	+650 -650	+15 +2	+84 0	+130 0	+210 0	+29 +8
> 30 ≤ 50	-80 -240	-50 -89	0 -11	0 -16	0 -25	0 -39	0 -62	0 -100	0 -160	0 -250	+310 -310	+800 -800	+18 +2	+100 0	+160 0	+250 0	+34 +9
> 50 ≤ 80	-100 -290	-60 -106	0 -13	0 -19	0 -30	0 -46	0 -74	0 -120	0 -190	0 -300	+370 -370	+950 -950	+21 +2	+120 0	+190 0	+300 0	+41 +11
> 80 ≤ 120	-120 -340	-72 -126	0 -15	0 -22	0 -35	0 -54	0 -87	0 -140	0 -220	0 -350	+435 -435	+1100 -1100	+25 +3	+140 0	+220 0	+350 0	+48 +13
> 120 ≤ 180	-145 -395	-85 -148	0 -18	0 -25	0 -40	0 -63	0 -100	0 -160	0 -250	0 -400	+500 -500	+1250 -1250	+28 +3	+160 0	+250 0	+400 0	+55 +15
> 180 ≤ 250	-170 -460	-100 -172	0 -20	0 -29	0 -46	0 -72	0 -115	0 -185	0 -290	0 -460	+575 -575	+1450 -1450	+33 +4	+185 0	+290 0	+460 0	+63 +17

Nominal size range in mm	Tolerances* for external dimensions	
	z9	
> 3	+51 +26	
> 3 ≤ 6	+65 +35	
> 6 ≤ 10	+78 +42	
> 10 ≤ 14	+93 +50	
> 14 ≤ 18	+103 +60	
> 18 ≤ 24	+125 +73	
> 24 ≤ 30	+140 +88	
> 30 ≤ 40	+174 +112	
> 40 ≤ 50	+196 +136	
> 50 ≤ 65	+246 +172	
> 65 ≤ 80	+284 +210	
> 80 ≤ 100	+345 +258	
> 100 ≤ 120	+397 +310	
> 120 ≤ 140	+465 +365	
> 140 ≤ 160	+515 +415	
> 160 ≤ 180	+565 +465	
> 180 ≤ 200	+635 +520	

Nominal size range in mm	Tolerances* for internal dimensions			
	H6	H7	H11	H12
> 3	+6 0	+10 0	+60 0	+0,10 0
> 3 ≤ 6	+8 0	+12 0	+75 0	+0,12 0
> 6 ≤ 10	+9 0	+15 0	+90 0	+0,15 0
> 10 ≤ 18	+11 0	+18 0	+110 0	+0,18 0
> 18 ≤ 30	+13 0	+21 0	+130 0	+0,21 0
> 30 ≤ 50	+16 0	+25 0	+160 0	+0,25 0
> 50 ≤ 80	+19 0	+30 0	+190 0	+0,30 0
> 80 ≤ 120	+22 0	+35 0	+220 0	+0,35 0
> 120 ≤ 180	+25 0	+40 0	+250 0	+0,40 0
> 180 ≤ 250	+29 0	+46 0	+290 0	+0,46 0

* Tolerances in µm in accordance with DIN ISO 286

