



Leading Through Innovation



HSS-PM

YG TAP Ti Ni

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- For Heat Resistant Super Alloys and Titanium Alloys Applied with Cutting Edge Rake Angles and Thread Relief
- Für hitzebeständige Superlegierungen und Titanlegierungen, mit Schneidkanten-Spanwinkeln und Gewindehinterschliff

HSS-PM
YG TAP
Ti Ni

Please visit globalygl.com/mat for material search

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	Hrc				
P	1	Non-alloy steel	About 0.15% C	Annealed	125					
	2		About 0.45% C	Annealed	190	13				
	3		About 0.45% C	Quenched & Tempered	250	25				
	4		About 0.75% C	Annealed	270	28				
	5		About 0.75% C	Quenched & Tempered	300	32				
	6	Low alloy steel		Annealed	180	10				
	7			Quenched & Tempered	275	29	○	○	○	○
	8			Quenched & Tempered	300	32	○	○	○	○
	9		Quenched & Tempered	350	38	○	○	○	○	
	10	High alloyed steel, and tool steel		Annealed	200	15				
11			Quenched & Tempered	325	35					
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15				
	13		Martensitic	Quenched & Tempered	240	23				
	14		Austenitic		180	10				
K	15	Grey cast iron	Pearlitic / ferritic		180	10				
	16		Pearlitic (Martensitic)		260	26				
	17	Nodular cast iron	Ferritic		160	3				
	18		Pearlitic		250	25				
	19	Malleable cast iron	Ferritic		130					
	20		Pearlitic		230	21				
N	21	Aluminum-wrought alloy	Not Curable		60					
	22		Curable		100					
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75					
	24		≤ 12% Si, Curable		90					
	25		> 12% Si, Not Curable		130					
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110					
	27		CuZn, CuSnZn (Brass)		90					
	28		CuSn, lead-free copper and electrolytic copper		100					
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic							
	30		Rubber, Wood, etc.							
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15	○	○	○	○
	32			Cured	280	30			○	○
	33			Annealed	250	25			○	○
	34		Ni or Co Based	Cured	350	38			○	○
	35			Cast	320	34			○	○
	36	Titanium Alloys	Pure Titanium		400 Rm		○	○	○	○
	37		Alpha + Beta Alloys	Hardened	1050 Rm		◎	◎	◎	◎
H	38	Hardened steel		Hardened	550	55				
	39			Hardened	630	60				
	40	Chilled Cast Iron		Cast	400	42			○	○
	41	Hardened Cast Iron		Hardened	550	55				

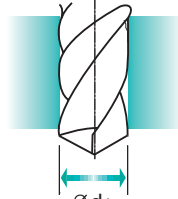
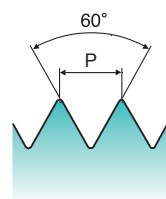
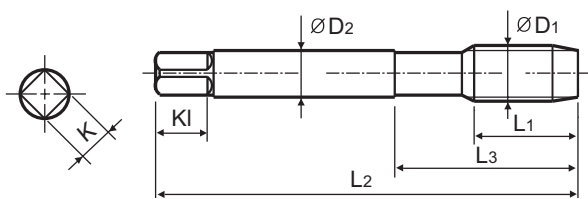
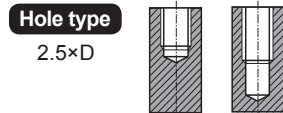
 Max. 2.5xD Blind Hole		 Max. 3.0xD Through Hole		 Max. 2.5xD Blind Hole		 Max. 3.0xD Through Hole	
HSS-PM							
C	C	B	B	C	C	B	B
Spiral Flute	Spiral Flute	Spiral Point	Spiral Point	Spiral Flute	Spiral Flute	Spiral Point	Spiral Point
R40	R40	-	-	R40	R40	-	-
TM933 (P.260)	TZ933 (P.261)	TM923 (P.262)	TZ923 (P.263)	TQ833 (P.264)	TR833 (P.265)	TQ873 (P.266)	TR873 (P.267)
							M
							MF
							UNC
							UNF
							BSW
							GBSP
							EGM
							EGUNC
							EGUNF
Bright	TiAlN	Bright	TiAlN	VAP	Bright	VAP	Bright
							
							1
							2
							3
							4
							5
⊙	⊙	⊙	⊙	⊙	⊙	⊙	6 P
⊙	⊙	⊙	⊙	⊙	⊙	⊙	7
⊙	⊙	⊙	⊙	⊙	⊙	⊙	8
⊙	⊙	⊙	⊙	⊙	⊙	⊙	9
							10
							11
							12
							13 M
							14
							15
							16
							17 K
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							21
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							25 N
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							30
⊙	⊙	⊙	⊙	⊙	⊙	⊙	31
⊙	⊙	⊙	⊙	⊙	⊙	⊙	32
⊙	⊙	⊙	⊙	⊙	⊙	⊙	33
⊙	⊙	⊙	⊙	⊙	⊙	⊙	34 S
⊙	⊙	⊙	⊙	⊙	⊙	⊙	35
				○	○	○	36
○	○	○	○	⊙	⊙	⊙	37
			○				38
		○	○			○	39 H
							40
							41

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
 ISO MÉTRIQUE DIN13
 ISO Metrico passo grosso DIN 13

► Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

► Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.



Ti HSS-PM DIN 371/376 6H 60° C Bright R25 Machine taps Maschinengewindebohrer

Recommended Cutting Page : P.268

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	KI	Z	Ød1
M2 × 0.4		TM903136	8	45	13	2.8	2.1	5	3	1.6
M2.2 × 0.45		TM903156	8	45	13	2.8	2.1	5	3	1.75
*M2.3 × 0.4		TM903196	8	45	13	2.8	2.1	5	3	1.9
M2.5 × 0.45		TM903176	9	50	15	2.8	2.1	5	3	2.05
*M2.6 × 0.45		TM903496	9	50	15	2.8	2.1	5	3	2.1
M3 × 0.5		TM903206	6	56	18	3.5	2.7	6	3	2.5
M3.5 × 0.6		TM903226	7	56	20	4	3	6	3	2.9
M4 × 0.7		TM903246	7	63	21	4.5	3.4	6	3	3.3
M4.5 × 0.75		TM903266	8	70	25	6	4.9	8	3	3.7
M5 × 0.8		TM903286	8	70	25	6	4.9	8	3	4.2
M6 × 1		TM903316	10	80	30	6	4.9	8	3	5
M7 × 1		TM903346	10	80	30	7	5.5	8	3	6
M8 × 1.25		TM903366	13	90	35	8	6.2	9	3	6.8
M9 × 1.25		TM903396	13	90	35	9	7	10	3	7.8
M10 × 1.5		TM903426	15	100	39	10	8	11	3	8.5
M11 × 1.5		TM903466	17	100	40	8	6.2	9	3	9.5
M12 × 1.75		TM903506	18	110	44	9	7	10	3	10.2
M14 × 2		TM903546	20	110	44	11	9	12	3	12
M16 × 2		TM903606	20	110	44	12	9	12	3	14
M18 × 2.5		TM903656	25	125	50	14	11	14	4	15.5
M20 × 2.5		TM903706	25	140	54	16	12	15	4	17.5
M22 × 2.5		TM903746	25	140	54	18	14.5	17	4	19.5
M24 × 3		TM903786	30	160	60	18	14.5	17	4	21
M27 × 3		TM903866	30	160	60	20	16	19	4	24
M30 × 3.5		TM903946	35	180	70	22	18	21	4	26.5

► DIN 371(M2~M10) and DIN 376(M11~M30)

► * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P										M					K									
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20					
HRC		13	25	28	32		29	32	38	15	35	15	23	10	10	26	3	25	21						
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230					
Recommended							○	○	○																

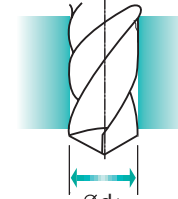
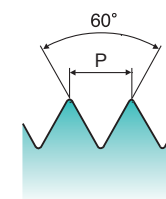
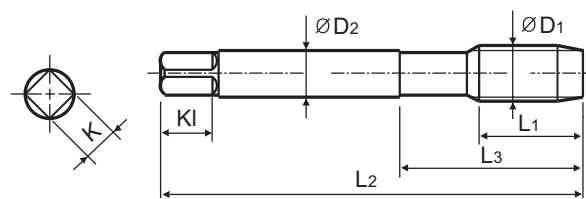
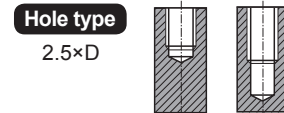
ISO	N										S										H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)				Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast iron	Hardened Cast iron		
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41		
HRC											15	30	25	38	34			55	60	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550		
Recommended											○					○	◎						

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
 ISO MÉTRIQUE DIN13
 ISO Metrico passo grosso DIN 13

► Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

► Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.



Ti HSS-PM DIN 371/376 6H 60° C TiAlN R25 Machine taps Maschinengewindebohrer

Recommended Cutting Page : P.268

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	TiAlN	L1	L2	L3	ØD2	K	KI	Z	Ød1
M2 × 0.4		TZ903136	8	45	13	2.8	2.1	5	3	1.6
M2.2 × 0.45		TZ903156	8	45	13	2.8	2.1	5	3	1.75
*M2.3 × 0.4		TZ903196	8	45	13	2.8	2.1	5	3	1.9
M2.5 × 0.45		TZ903176	9	50	15	2.8	2.1	5	3	2.05
*M2.6 × 0.45		TZ903496	9	50	15	2.8	2.1	5	3	2.1
M3 × 0.5		TZ903206	6	56	18	3.5	2.7	6	3	2.5
M3.5 × 0.6		TZ903226	7	56	20	4	3	6	3	2.9
M4 × 0.7		TZ903246	7	63	21	4.5	3.4	6	3	3.3
M4.5 × 0.75		TZ903266	8	70	25	6	4.9	8	3	3.7
M5 × 0.8		TZ903286	8	70	25	6	4.9	8	3	4.2
M6 × 1		TZ903316	10	80	30	6	4.9	8	3	5
M7 × 1		TZ903346	10	80	30	7	5.5	8	3	6
M8 × 1.25		TZ903366	13	90	35	8	6.2	9	3	6.8
M9 × 1.25		TZ903396	13	90	35	9	7	10	3	7.8
M10 × 1.5		TZ903426	15	100	39	10	8	11	3	8.5
M11 × 1.5		TZ903466	17	100	40	8	6.2	9	3	9.5
M12 × 1.75		TZ903506	18	110	44	9	7	10	3	10.2
M14 × 2		TZ903546	20	110	44	11	9	12	3	12
M16 × 2		TZ903606	20	110	44	12	9	12	3	14
M18 × 2.5		TZ903656	25	125	50	14	11	14	4	15.5
M20 × 2.5		TZ903706	25	140	54	16	12	15	4	17.5
M22 × 2.5		TZ903746	25	140	54	18	14.5	17	4	19.5
M24 × 3		TZ903786	30	160	60	18	14.5	17	4	21
M27 × 3		TZ903866	30	160	60	20	16	19	4	24
M30 × 3.5		TZ903946	35	180	70	22	18	21	4	26.5

► DIN 371(M2~M10) and DIN 376(M11~M30)

► * DIN profile not ISO

◎ : Excellent ○ : Good

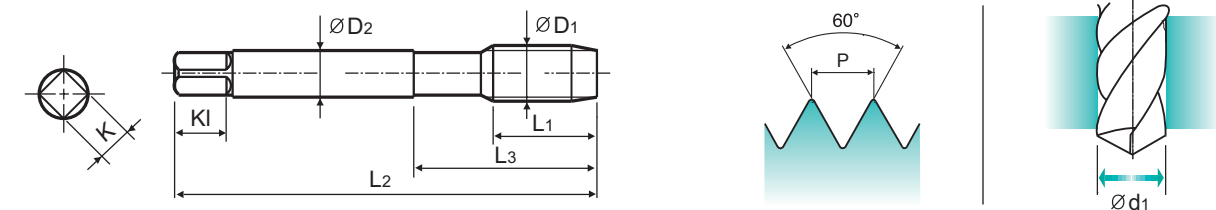
P										M						K												
ISO	Non-alloy steel					Low alloy steel				High alloy steel and tool steel		Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron								
Material Description																												
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20								
HRC		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21									
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230								
Recommended							○	○	○																			
ISO	N										S										H							
Material Description	Aluminum-wrought alloy					Aluminum-cast, alloyed					Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41							
HRC											15	30	25	38	34	10	26	55	60	42	55							
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550							
Recommended											○						◎											

M-Az ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Interrupted tap to reduce contact area and tapping torque, and to give more chip space.

Gewindebohrer mit ausgesetzten Zähnen um die Kontaktzone mit dem Werkstück und das Drehmoment zu minimieren und dem Span mehr Raum zu geben.



Recommended Cutting Page : P.268 Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	KI	Z	Ød1
M2 × 0.4		TM293136	8	45	13	2.8	2.1	5	3	1.6
M2.2 × 0.45		TM293156	8	45	13	2.8	2.1	5	3	1.75
*M2.3 × 0.4		TM293196	8	45	13	2.8	2.1	5	3	1.9
M2.5 × 0.45		TM293176	9	50	15	2.8	2.1	5	3	2.05
*M2.6 × 0.45		TM293496	9	50	15	2.8	2.1	5	3	2.1
M3 × 0.5		TM293206	11	56	18	3.5	2.7	6	3	2.5
M3.5 × 0.6		TM293226	12	56	20	4	3	6	3	2.9
M4 × 0.7		TM293246	13	63	21	4.5	3.4	6	3	3.3
M4.5 × 0.75		TM293266	14	70	25	6	4.9	8	3	3.7
M5 × 0.8		TM293286	15	70	25	6	4.9	8	3	4.2
M6 × 1		TM293316	17	80	30	6	4.9	8	3	5
M7 × 1		TM293346	17	80	30	7	5.5	8	3	6
M8 × 1.25		TM293366	20	90	35	8	6.2	9	3	6.8
M9 × 1.25		TM293396	20	90	35	9	7	10	3	7.8
M10 × 1.5		TM293426	22	100	39	10	8	11	3	8.5
M11 × 1.5		TM293466	22	100	40	8	6.2	9	3	9.5
M12 × 1.75		TM293506	24	110	44	9	7	10	3	10.2
M14 × 2		TM293546	26	110	44	11	9	12	3	12
M16 × 2		TM293606	27	110	44	12	9	12	3	14
M18 × 2.5		TM293656	30	125	50	14	11	14	4	15.5
M20 × 2.5		TM293706	32	140	54	16	12	15	4	17.5
M22 × 2.5		TM293746	32	140	54	18	14.5	17	4	19.5
M24 × 3		TM293786	34	160	60	18	14.5	17	4	21
M27 × 3		TM293866	36	160	60	20	16	19	4	24
M30 × 3.5		TM293946	40	180	70	22	18	21	4	26.5

DIN 371(M2~M10) and DIN 376(M11~M30)

* DIN profile not ISO

◎ : Excellent ○ : Good

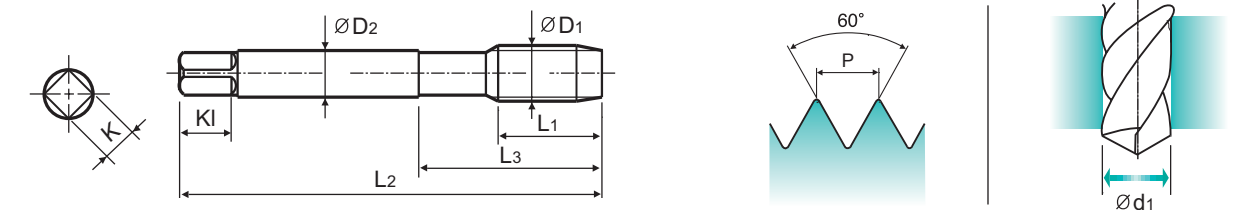
ISO	P										M					K							
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron				
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20			
HRC		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21				
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230			
Recommended							○	○	○														
ISO	N										S										H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)				Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast iron	Hardened Cast iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41		
HRC											15	30	25	38	34			55	60	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550		
Recommended											○	○	○	○	○	○	◎			○			

M-Az ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Interrupted tap to reduce contact area and tapping torque, and to give more chip space.

Gewindebohrer mit ausgesetzten Zähnen um die Kontaktzone mit dem Werkstück und das Drehmoment zu minimieren und dem Span mehr Raum zu geben.



Recommended Cutting Page : P.268 Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	TiAlN	L1	L2	L3	ØD2	K	KI	Z	Ød1
M2 × 0.4		TZ293136	8	45	13	2.8	2.1	5	3	1.6
M2.2 × 0.45		TZ293156	8	45	13	2.8	2.1	5	3	1.75
*M2.3 × 0.4		TZ293196	8	45	13	2.8	2.1	5	3	1.9
M2.5 × 0.45		TZ293176	9	50	15	2.8	2.1	5	3	2.05
*M2.6 × 0.45		TZ293496	9	50	15	2.8	2.1	5	3	2.1
M3 × 0.5		TZ293206	11	56	18	3.5	2.7	6	3	2.5
M3.5 × 0.6		TZ293226	12	56	20	4	3	6	3	2.9
M4 × 0.7		TZ293246	13	63	21	4.5	3.4	6	3	3.3
M4.5 × 0.75		TZ293266	14	70	25	6	4.9	8	3	3.7
M5 × 0.8		TZ293286	15	70	25	6	4.9	8	3	4.2
M6 × 1		TZ293316	17	80	30	6	4.9	8	3	5
M7 × 1		TZ293346	17	80	30	7	5.5	8	3	6
M8 × 1.25		TZ293366	20	90	35	8	6.2	9	3	6.8
M9 × 1.25		TZ293396	20	90	35	9	7	10	3	7.8
M10 × 1.5		TZ293426	22	100	39	10	8	11	3	8.5
M11 × 1.5		TZ293466	22	100	40	8	6.2	9	3	9.5
M12 × 1.75		TZ293506	24	110	44	9	7	10	3	10.2
M14 × 2		TZ293546	26	110	44	11	9	12	3	12
M16 × 2		TZ293606	27	110	44	12	9	12	3	14
M18 × 2.5		TZ293656	30	125	50	14	11	14	4	15.5
M20 × 2.5		TZ293706	32	140	54	16	12	15	4	17.5
M22 × 2.5		TZ293746	32	140	54	18	14.5	17	4	19.5
M24 × 3		TZ293786	34	160	60	18	14.5	17	4	21
M27 × 3		TZ293866	36	160	60	20	16	19	4	24
M30 × 3.5		TZ293946	40	180	70	22	18	21	4	26.5

DIN 371(M2~M10) and DIN 376(M11~M30)

* DIN profile not ISO

◎ : Excellent ○ : Good

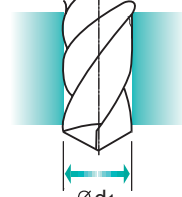
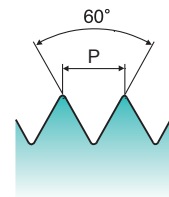
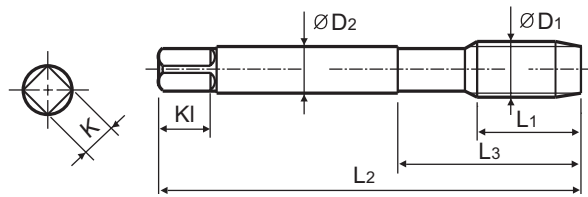
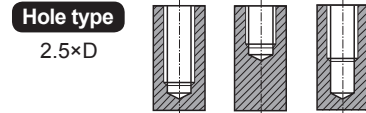
ISO	P											M				K						
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron			
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRC		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommended							○	○	○													
ISO	N									S							H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron		
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRC											15	30	20	25	38	34		55	60	42	55	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550	
Recommended											○	○	○	○	○	○	○			○		

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
 ISO MÉTRIQUE DIN13
 ISO Metrico passo grosso DIN 13

► For tapping Nickel alloys and heat resistant alloy steels which are used in aerospace and chemical industries.

► Zum Gewindeschneiden von Nickellegierungen und hitzefesten Legierungsstählen, die in der Luftfahrtindustrie und chemischen Industrie verwendet werden.



Ni HSS-PM DIN 371/376 6H 60° C Bright R40 Machine taps Maschinengewindebohrer

Recommended Cutting Page : P.268

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	KI	Z	Ød1
M2 × 0.4		TM933136	8	45	13	2.8	2.1	5	3	1.6
M2.2 × 0.45		TM933156	8	45	13	2.8	2.1	5	3	1.75
*M2.3 × 0.4		TM933196	8	45	13	2.8	2.1	5	3	1.9
M2.5 × 0.45		TM933176	9	50	15	2.8	2.1	5	3	2.05
*M2.6 × 0.45		TM933496	9	50	15	2.8	2.1	5	3	2.1
M3 × 0.5		TM933206	6	56	18	3.5	2.7	6	3	2.5
M3.5 × 0.6		TM933226	7	56	20	4	3	6	3	2.9
M4 × 0.7		TM933246	7	63	21	4.5	3.4	6	3	3.3
M4.5 × 0.75		TM933266	8	70	25	6	4.9	8	3	3.7
M5 × 0.8		TM933286	8	70	25	6	4.9	8	3	4.2
M6 × 1		TM933316	10	80	30	6	4.9	8	3	5
M7 × 1		TM933346	10	80	30	7	5.5	8	3	6
M8 × 1.25		TM933366	13	90	35	8	6.2	9	3	6.8
M9 × 1.25		TM933396	13	90	35	9	7	10	3	7.8
M10 × 1.5		TM933426	15	100	39	10	8	11	3	8.5
M11 × 1.5		TM933466	17	100	40	8	6.2	9	3	9.5
M12 × 1.75		TM933506	18	110	44	9	7	10	3	10.2
M14 × 2		TM933546	20	110	44	11	9	12	3	12
M16 × 2		TM933606	20	110	44	12	9	12	3	14
M18 × 2.5		TM933656	25	125	50	14	11	14	4	15.5
M20 × 2.5		TM933706	25	140	54	16	12	15	4	17.5
M22 × 2.5		TM933746	25	140	54	18	14.5	17	4	19.5
M24 × 3		TM933786	30	160	60	18	14.5	17	4	21
M27 × 3		TM933866	30	160	60	20	16	19	4	24
M30 × 3.5		TM933946	35	180	70	22	18	21	4	26.5

► DIN 371(M2~M10) and DIN 376(M11~M30)

► * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P										M					K					
Material Description	Non-alloy steel					Low alloy steel					High alloy steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended						◎	◎	◎	◎												

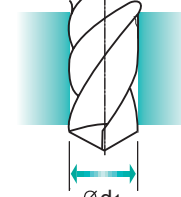
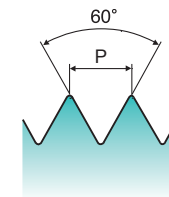
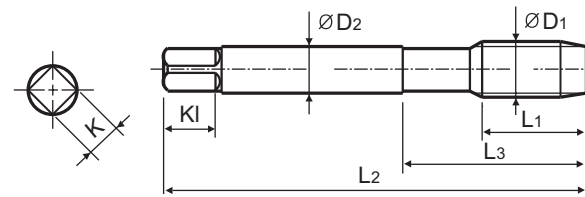
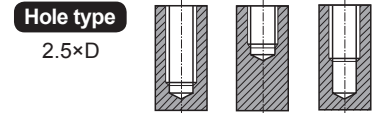
ISO	N										S										H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)				Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast iron	Hardened Cast iron		
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41		
HRC											15	30	25	38	34			55	60	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550		
Recommended											◎	◎	◎	◎	◎		○						

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
 ISO MÉTRIQUE DIN13
 ISO Metrico passo grosso DIN 13

► For tapping Nickel alloys and heat resistant alloy steels which are used in aerospace and chemical industries.

► Zum Gewindeschneiden von Nickellegierungen und hitzefesten Legierungsstählen, die in der Luftfahrtindustrie und chemischen Industrie verwendet werden.



Ni HSS-PM DIN 371/376 6H 60° C TiAlN R40 Machine taps Maschinengewindebohrer

Recommended Cutting Page : P.268

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	TiAlN	L1	L2	L3	ØD2	K	KI	Z	Ød1
M2 × 0.4		TZ933136	8	45	13	2.8	2.1	5	3	1.6
M2.2 × 0.45		TZ933156	8	45	13	2.8	2.1	5	3	1.75
*M2.3 × 0.4		TZ933196	8	45	13	2.8	2.1	5	3	1.9
M2.5 × 0.45		TZ933176	9	50	15	2.8	2.1	5	3	2.05
*M2.6 × 0.45		TZ933496	9	50	15	2.8	2.1	5	3	2.1
M3 × 0.5		TZ933206	6	56	18	3.5	2.7	6	3	2.5
M3.5 × 0.6		TZ933226	7	56	20	4	3	6	3	2.9
M4 × 0.7		TZ933246	7	63	21	4.5	3.4	6	3	3.3
M4.5 × 0.75		TZ933266	8	70	25	6	4.9	8	3	3.7
M5 × 0.8		TZ933286	8	70	25	6	4.9	8	3	4.2
M6 × 1		TZ933316	10	80	30	6	4.9	8	3	5
M7 × 1		TZ933346	10	80	30	7	5.5	8	3	6
M8 × 1.25		TZ933366	13	90	35	8	6.2	9	3	6.8
M9 × 1.25		TZ933396	13	90	35	9	7	10	3	7.8
M10 × 1.5		TZ933426	15	100	39	10	8	11	3	8.5
M11 × 1.5		TZ933466	17	100	40	8	6.2	9	3	9.5
M12 × 1.75		TZ933506	18	110	44	9	7	10	3	10.2
M14 × 2		TZ933546	20	110	44	11	9	12	3	12
M16 × 2		TZ933606	20	110	44	12	9	12	3	14
M18 × 2.5		TZ933656	25	125	50	14	11	14	4	15.5
M20 × 2.5		TZ933706	25	140	54	16	12	15	4	17.5
M22 × 2.5		TZ933746	25	140	54	18	14.5	17	4	19.5
M24 × 3		TZ933786	30	160	60	18	14.5	17	4	21
M27 × 3		TZ933866	30	160	60	20	16	19	4	24
M30 × 3.5		TZ933946	35	180	70	22	18	21	4	26.5

► DIN 371(M2~M10) and DIN 376(M11~M30)

► * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P										M					K								
Material Description	Non-alloy steel					Low alloy steel					High alloy steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron			Malleable cast iron			
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20				
HRC		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21				
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230				
Recommended						◎	◎	◎	◎															

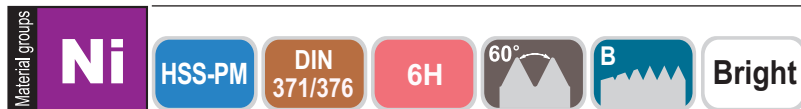
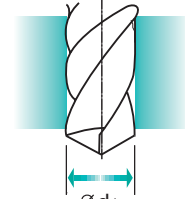
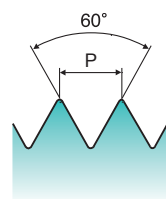
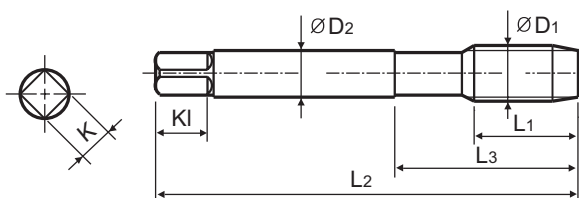
ISO	N										S										H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast iron		Hardened Cast iron			
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41				
HRC											15	30	25	38	34			55	60	42	55				
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550				
Recommended											◎	◎	◎	◎	◎		○								

M ISO metric coarse threads DIN 13

- Metrisches ISO-Gewinde DIN 13
- ISO MÉTRIQUE DIN13
- ISO Metrico passo grosso DIN 13

► For tapping Nickel alloys and heat resistant alloy steels which are used in aero space and chemical industries.

► Zum Gewindeschneiden von Nickellegierungen und hitzefesten Legierungsstählen, die in der Luftfahrtindustrie und chemischen Industrie verwendet werden.



Machine taps
Maschinengewindebohrer

Recommended Cutting Page : P.268

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	KI	Z	Ød1
M2 × 0.4		TM923136	8	45	13	2.8	2.1	5	3	1.6
M2.2 × 0.45		TM923156	8	45	13	2.8	2.1	5	3	1.75
*M2.3 × 0.4		TM923196	8	45	13	2.8	2.1	5	3	1.9
M2.5 × 0.45		TM923176	9	50	15	2.8	2.1	5	3	2.05
*M2.6 × 0.45		TM923496	9	50	15	2.8	2.1	5	3	2.1
M3 × 0.5		TM923206	11	56	18	3.5	2.7	6	3	2.5
M3.5 × 0.6		TM923226	12	56	20	4	3	6	3	2.9
M4 × 0.7		TM923246	13	63	21	4.5	3.4	6	3	3.3
M4.5 × 0.75		TM923266	14	70	25	6	4.9	8	3	3.7
M5 × 0.8		TM923286	15	70	25	6	4.9	8	3	4.2
M6 × 1		TM923316	17	80	30	6	4.9	8	3	5
M7 × 1		TM923346	17	80	30	7	5.5	8	3	6
M8 × 1.25		TM923366	20	90	35	8	6.2	9	3	6.8
M9 × 1.25		TM923396	20	90	35	9	7	10	3	7.8
M10 × 1.5		TM923426	22	100	39	10	8	11	3	8.5
M11 × 1.5		TM923466	22	100	40	8	6.2	9	3	9.5
M12 × 1.75		TM923506	24	110	44	9	7	10	3	10.2
M14 × 2		TM923546	26	110	44	11	9	12	3	12
M16 × 2		TM923606	27	110	44	12	9	12	3	14
M18 × 2.5		TM923656	30	125	50	14	11	14	4	15.5
M20 × 2.5		TM923706	32	140	54	16	12	15	4	17.5
M22 × 2.5		TM923746	32	140	54	18	14.5	17	4	19.5
M24 × 3		TM923786	34	160	60	18	14.5	17	4	21
M27 × 3		TM923866	36	160	60	20	16	19	4	24
M30 × 3.5		TM923946	40	180	70	22	18	21	4	26.5

► DIN 371(M2~M10) and DIN 376(M11~M30)

► * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P										M					K				
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRC	13	13	25	28	32	10	29	32	38	15	35	12	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended						◎	◎	◎	◎											

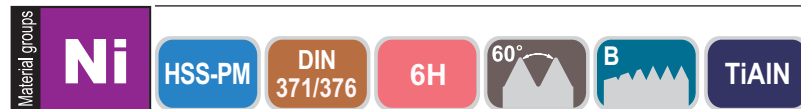
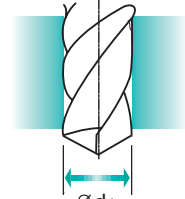
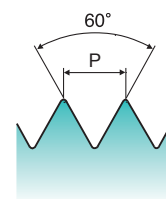
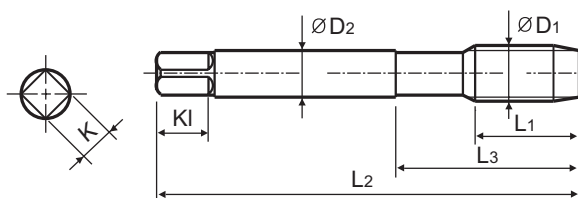
ISO	N										S										H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)				Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron		Hardened Cast Iron		
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41				
HRC	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41				
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550				
Recommended											◎	◎	◎	◎	◎						◎				

M ISO metric coarse threads DIN 13

- Metrisches ISO-Gewinde DIN 13
- ISO MÉTRIQUE DIN13
- ISO Metrico passo grosso DIN 13

► For tapping Nickel alloys and heat resistant alloy steels which are used in aero space and chemical industries.

► Zum Gewindeschneiden von Nickellegierungen und hitzefesten Legierungsstählen, die in der Luftfahrtindustrie und chemischen Industrie verwendet werden.



Machine taps
Maschinengewindebohrer

Recommended Cutting Page : P.268

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	TiAlN	L1	L2	L3	ØD2	K	KI	Z	Ød1
M2 × 0.4		TZ923136	8	45	13	2.8	2.1	5	3	1.6
M2.2 × 0.45		TZ923156	8	45	13	2.8	2.1	5	3	1.75
*M2.3 × 0.4		TZ923196	8	45	13	2.8	2.1	5	3	1.9
M2.5 × 0.45		TZ923176	9	50	15	2.8	2.1	5	3	2.05
*M2.6 × 0.45		TZ923496	9	50	15	2.8	2.1	5	3	2.1
M3 × 0.5		TZ923206	11	56	18	3.5	2.7	6	3	2.5
M3.5 × 0.6		TZ923226	12	56	20	4	3	6	3	2.9
M4 × 0.7		TZ923246	13	63	21	4.5	3.4	6	3	3.3
M4.5 × 0.75		TZ923266	14	70	25	6	4.9	8	3	3.7
M5 × 0.8		TZ923286	15	70	25	6	4.9	8	3	4.2
M6 × 1		TZ923316	17	80	30	6	4.9	8	3	5
M7 × 1		TZ923346	17	80	30	7	5.5	8	3	6
M8 × 1.25		TZ923366	20	90	35	8	6.2	9	3	6.8
M9 × 1.25		TZ923396	20	90	35	9	7	10	3	7.8
M10 × 1.5		TZ923426	22	100	39	10	8	11	3	8.5
M11 × 1.5		TZ923466	22	100	40	8	6.2	9	3	9.5
M12 × 1.75		TZ923506	24	110	44	9	7	10	3	10.2
M14 × 2		TZ923546	26	110	44	11	9	12	3	12
M16 × 2		TZ923606	27	110	44	12	9	12	3	14
M18 × 2.5		TZ923656	30	125	50	14	11	14	4	15.5
M20 × 2.5		TZ923706	32	140	54	16	12	15	4	17.5
M22 × 2.5		TZ923746	32	140	54	18	14.5	17	4	19.5
M24 × 3		TZ923786	34	160	60	18	14.5	17	4	21
M27 × 3		TZ923866	36	160	60	20	16	19	4	24
M30 × 3.5		TZ923946	40	180	70	22	18	21	4	26.5

► DIN 371(M2~M10) and DIN 376(M11~M30)

► * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P										M					K				
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRC		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended						◎	◎	◎	◎											

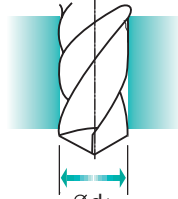
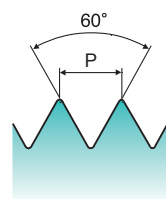
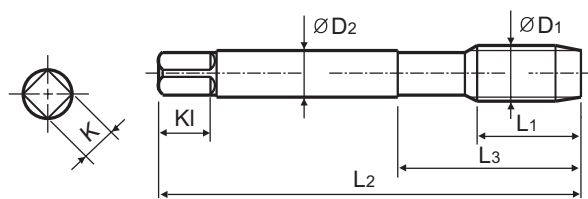
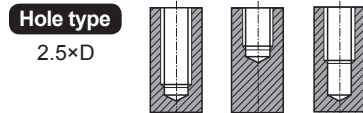
ISO	N										S										H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)				Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast iron		Hardened Cast iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41			
HRC											15	30	25	38	34			55	60	42	55			
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550			
Recommended											◎	◎	◎	◎	◎			◎	◎	◎	◎			

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

► Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

► Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.



Recommended Cutting Page : P.268

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Vap	L1	L2	L3	ØD2	K	KI	Z	Ød1
M2 × 0.4		TQ833136	8	45	13	2.8	2.1	5	3	1.6
M2.2 × 0.45		TQ833156	8	45	13	2.8	2.1	5	3	1.75
M2.5 × 0.45		TQ833176	9	50	15	2.8	2.1	5	3	2.05
M3 × 0.5		TQ833206	6	56	18	3.5	2.7	6	3	2.5
M3.5 × 0.6		TQ833226	7	56	20	4	3	6	3	2.9
M4 × 0.7		TQ833246	7	63	21	4.5	3.4	6	3	3.3
M4.5 × 0.75		TQ833266	8	70	25	6	4.9	8	3	3.7
M5 × 0.8		TQ833286	8	70	25	6	4.9	8	3	4.2
M6 × 1		TQ833316	10	80	30	6	4.9	8	3	5
M7 × 1		TQ833346	10	80	30	7	5.5	8	3	6
M8 × 1.25		TQ833366	13	90	35	8	6.2	9	3	6.8
M10 × 1.5		TQ833426	15	100	39	10	8	11	3	8.5
M12 × 1.75		TQ833506	18	110	44	9	7	10	3	10.2

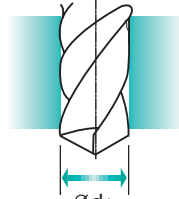
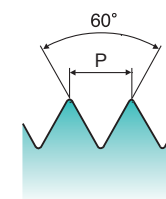
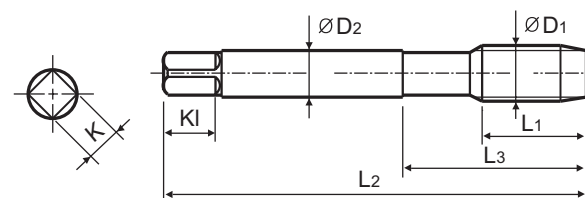
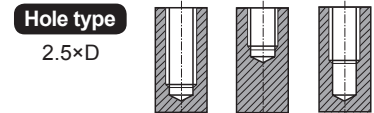
►DIN 371(M2~M10) and DIN 376(M12)

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

► Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

► Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.



Recommended Cutting Page : P.268

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	KI	Z	Ød1
M2 × 0.4		TR833136	8	45	13	2.8	2.1	5	3	1.6
M2.2 × 0.45		TR833156	8	45	13	2.8	2.1	5	3	1.75
M2.5 × 0.45		TR833176	9	50	15	2.8	2.1	5	3	2.05
M3 × 0.5		TR833206	6	56	18	3.5	2.7	6	3	2.5
M3.5 × 0.6		TR833226	7	56	20	4	3	6	3	2.9
M4 × 0.7		TR833246	7	63	21	4.5	3.4	6	3	3.3
M4.5 × 0.75		TR833266	8	70	25	6	4.9	8	3	3.7
M5 × 0.8		TR833286	8	70	25	6	4.9	8	3	4.2
M6 × 1		TR833316	10	80	30	6	4.9	8	3	5
M7 × 1		TR833346	10	80	30	7	5.5	8	3	6
M8 × 1.25		TR833366	13	90	35	8	6.2	9	3	6.8
M10 × 1.5		TR833426	15	100	39	10	8	11	3	8.5
M12 × 1.75		TR833506	18	110	44	9	7	10	3	10.2

►DIN 371(M2~M10) and DIN 376(M12)

◎ : Excellent ○ : Good

ISO	P										M					K				
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel					Stainless steel				
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended						◎	◎	◎	◎											
ISO	N										S					H				
Material Description	Aluminum-wrought alloy					Aluminum-cast, alloyed					Copper and Copper Alloys (Bronze / Brass)					Non Metallic Materials				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
HRc																				
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400
Recommended											◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

◎ : Excellent ○ : Good

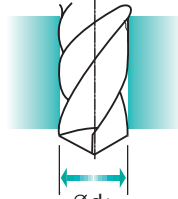
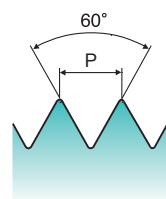
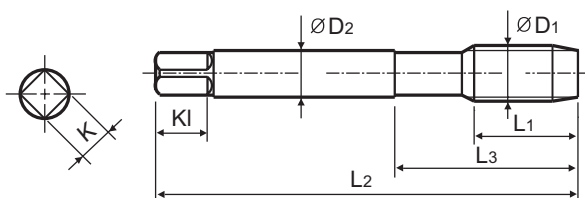
ISO	P										M					K				
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel					Stainless steel				
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended						◎	◎	◎	◎											
ISO	N										S					H				
Material Description	Aluminum-wrought alloy					Aluminum-cast, alloyed					Copper and Copper Alloys (Bronze / Brass)					Non Metallic Materials				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
HRc																				
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400
Recommended											◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

► Suitable for through hole in more cutting speed than other taps due to thick web and the best substrate.

► Geeignet für Durchgangslöcher in höherer Schnittgeschwindigkeit als bei anderen Gewindebohrern dank größerer Kerndicke und bestem Werkstoff.



Ti Ni

HSS-PM

DIN 371/376

6H

60°

B

Vap

Machine taps
Maschinengewindebohrer

Recommended Cutting Page : P.268

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Vap	L1	L2	L3	ØD2	K	KI	Z	Ød1
M2 × 0.4		TQ873136	8	45	13	2.8	2.1	5	3	1.6
M2.2 × 0.45		TQ873156	8	45	13	2.8	2.1	5	3	1.75
M2.5 × 0.45		TQ873176	9	50	15	2.8	2.1	5	3	2.05
M3 × 0.5		TQ873206	11	56	18	3.5	2.7	6	3	2.5
M3.5 × 0.6		TQ873226	12	56	20	4	3	6	3	2.9
M4 × 0.7		TQ873246	13	63	21	4.5	3.4	6	3	3.3
M4.5 × 0.75		TQ873266	14	70	25	6	4.9	8	3	3.7
M5 × 0.8		TQ873286	15	70	25	6	4.9	8	3	4.2
M6 × 1		TQ873316	17	80	30	6	4.9	8	3	5
M7 × 1		TQ873346	17	80	30	7	5.5	8	3	6
M8 × 1.25		TQ873366	20	90	35	8	6.2	9	3	6.8
M10 × 1.5		TQ873426	22	100	39	10	8	11	3	8.5
M12 × 1.75		TQ873506	24	110	44	9	7	10	3	10.2

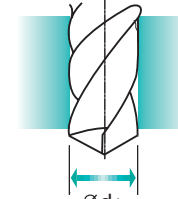
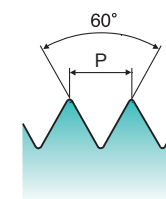
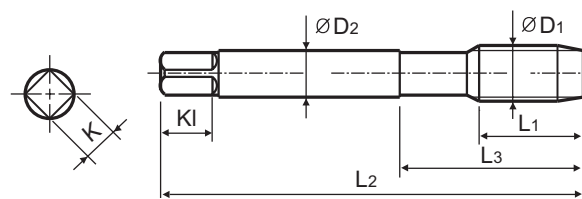
►DIN 371(M2~M10) and DIN 376(M12)

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

► Suitable for through hole in more cutting speed than other taps due to thick web and the best substrate.

► Geeignet für Durchgangslöcher in höherer Schnittgeschwindigkeit als bei anderen Gewindebohrern dank größerer Kerndicke und bestem Werkstoff.



Ti Ni

HSS-PM

DIN 371/376

6H

60°

B

Bright

Machine taps
Maschinengewindebohrer

Recommended Cutting Page : P.268

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	KI	Z	Ød1
M2 × 0.4		TR873136	8	45	13	2.8	2.1	5	3	1.6
M2.2 × 0.45		TR873156	8	45	13	2.8	2.1	5	3	1.75
M2.5 × 0.45		TR873176	9	50	15	2.8	2.1	5	3	2.05
M3 × 0.5		TR873206	11	56	18	3.5	2.7	6	3	2.5
M3.5 × 0.6		TR873226	12	56	20	4	3	6	3	2.9
M4 × 0.7		TR873246	13	63	21	4.5	3.4	6	3	3.3
M4.5 × 0.75		TR873266	14	70	25	6	4.9	8	3	3.7
M5 × 0.8		TR873286	15	70	25	6	4.9	8	3	4.2
M6 × 1		TR873316	17	80	30	6	4.9	8	3	5
M7 × 1		TR873346	17	80	30	7	5.5	8	3	6
M8 × 1.25		TR873366	20	90	35	8	6.2	9	3	6.8
M10 × 1.5		TR873426	22	100	39	10	8	11	3	8.5
M12 × 1.75		TR873506	24	110	44	9	7	10	3	10.2

►DIN 371(M2~M10) and DIN 376(M12)

◎ : Excellent ○ : Good

ISO	P										M					K				
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel					Stainless steel				
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended						◎	◎	◎	◎											
ISO	N										S									
Material Description	Aluminum-wrought alloy					Aluminum-cast, alloyed					Copper and Copper Alloys (Bronze / Brass)					Non Metallic Materials				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
HRc																				
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400
Recommended											◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

◎ : Excellent ○ : Good

ISO	P										M					K				
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel					Stainless steel				
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended						◎	◎	◎	◎											
ISO	N										S									
Material Description	Aluminum-wrought alloy					Aluminum-cast, alloyed					Copper and Copper Alloys (Bronze / Brass)					Non Metallic Materials				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
HRc																				
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400
Recommended											◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

					TM903	TZ903	TM293	TZ293	TM933	TZ933	TM923	TZ923	TQ833	TR833	TQ873	TR873
ISO	VDI 3323	Material Description	HB	HRc	Vc (m/min)											
P	1	Non-alloy steel	125													
	2		190	13												
	3		250	25												
	4		270	28												
	5		300	32												
	6	Low alloy steel	180	10					10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15
	7		275	29	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15
	8		300	32	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10
	9		350	38	3-5	3-5	3-5	3-5	3-5	3-5	3-5	3-5	3-5	3-5	3-5	3-5
	10	High alloyed steel, and tool steel	200	15												
	11		325	35												
M	12	Stainless steel	200	15												
	13		240	23												
	14		180	10												
K	15	Grey cast iron	180	10												
	16		260	26												
	17	Nodular cast iron	160	3												
	18		250	25												
	19	Malleable cast iron	130													
	20		230	21												
N	21	Aluminum-wrought alloy	60													
	22		100													
	23	Aluminum-cast, alloyed	75													
	24		90													
	25		130													
	26	Copper and Copper Alloys (Bronze / Brass)	110													
	27		90													
	28		100													
	29	Non Metallic Materials														
	30															
S	31	Heat Resistant Super Alloys	200	15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15
	32		280	30			10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15
	33		250	25			2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4
	34		350	38			2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4
	35		320	34			2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4
	36	Titanium Alloys	400Rm		10-15	10-15	10-15	10-15					10-15	10-15	10-15	10-15
	37		1050Rm		4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6
H	38	Hardened steel	550	55								3-5				
	39		630	60												
	40	Chilled Cast Iron	400	42			3-5	3-5			3-5	3-5			3-5	3-5
	41	Hardened Cast Iron	550	55												