Registered
ISO 9001:2015 / ISO 14001:2015

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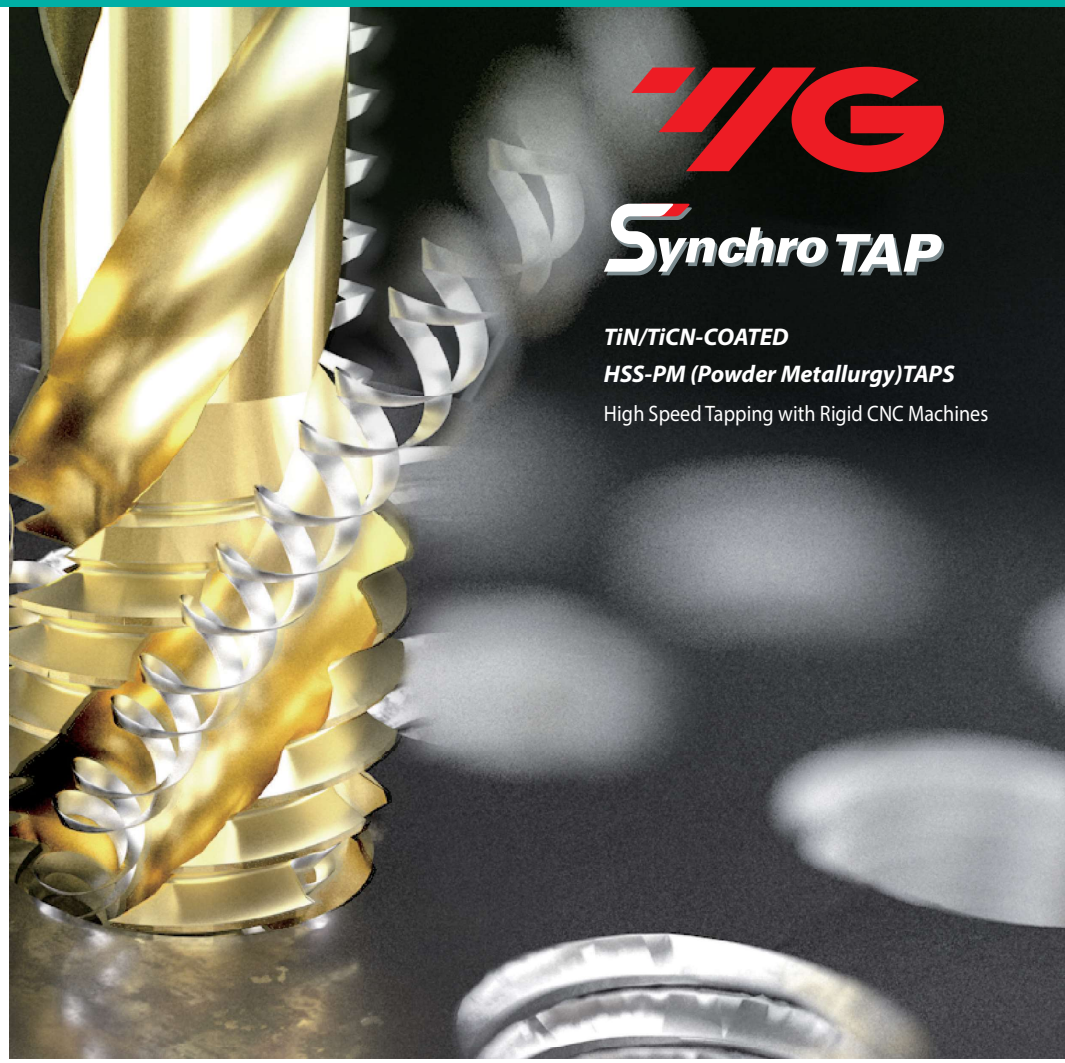
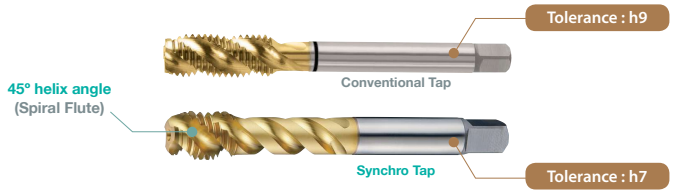


Synchro TAP

TiN/TiCN-COATED
HSS-PM (Powder Metallurgy)TAPS
High Speed Tapping with Rigid CNC Machines

FEATURES OF GEOMETRY

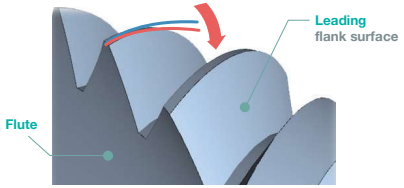
▶ **Shorter thread length** to reduce chip problems when tapping at higher spindle speeds



▶ **Tightened Shank Tolerance 'h7' for precision clamping and rigid tapping**

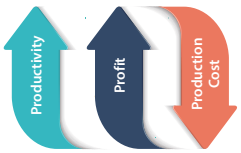
▶ **More thread relief**
for high speed tapping

▶ **HSS-PM (Powder Metallurgy)**
for improved wear resistance and longer tool life

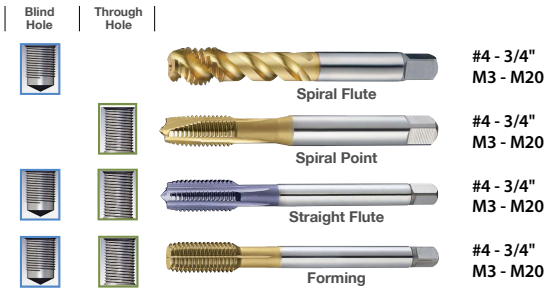


ADVANTAGES

▶ **PRODUCTIVITY**
Up to 3 times Faster compared to conventional taps



▶ **4 kinds of taps are available**



#4 - 3/4"
M3 - M20

#4 - 3/4"
M3 - M20

#4 - 3/4"
M3 - M20

#4 - 3/4"
M3 - M20

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SYNCHRO TAPPING CHUCK (ER TYPE)

See Page No. 20

▶ **When using Synchro taps, YG-1 strongly recommends SYNCHRO Tapping Chuck for the best thread quality and superior tool life**

CAT(ASME B5.50)

▶ Feature :
- To compensate for synchronization errors to extend tap life and to improve thread quality
- To compensate for pitch tolerances of taps
- For machine with synchronized spindle

▶ BT(JIS B6339/MAS-403), HSK(DIN 69893/ISO 12164-1) and K-STRAIGHT taper products are available

GUIDE LINE TO ICONS

Work Piece Material
GS — Steels with good machinability Rm < 850N/mm²
GG — Grey Cast Iron
GV — Any material with at least 8~10% elongation

Helix Angle
R45°

Thread Angle
60°

Standard of Tools
ANSI CAT

Pitch Limit
H D

Chamfer Lead
2P~3P 4P~5P

Taper Accuracy
AT3

Tool Raw Material
HSS PM

Surface Treatment
TiCN — Titanium Carbon Nitride Coating
TiN — Titanium Nitride Coating

Coolant System
AD/B

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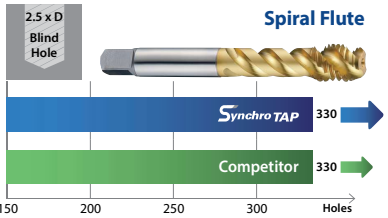
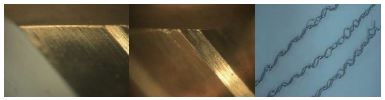
CASE STUDY

▶ SPIRAL FLUTE TAP M10 x 1.5

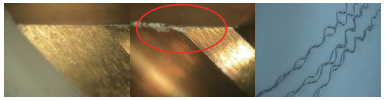
Tool	Synchro TAP Spiral Flute Tap	Competitor
Size	M10 x 1.5	
Work Material	C45 / 1045 / S45C Hardness : HRc20	
Cutting Speed	98.4 ft/min.	
RPM	955 rev./min.	
Tapping Depth	.9843" (2.5xD / Blind Hole)	
Tapping Holes	330	
Cooling Method	External Cooling Water Soluble (9% Emulsion)	
Machine	Machining Center	



Synchro TAP

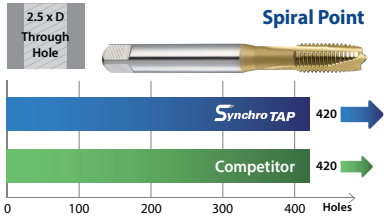


Competitor

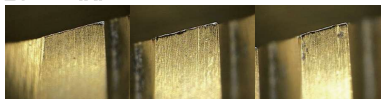


▶ SPIRAL POINT TAP M6 x 1.0

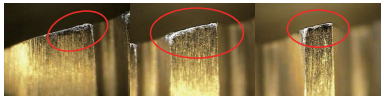
Tool	Synchro TAP Spiral Point Tap	Competitor
Size	M6 x 1.0	
Work Material	4140 / 42CrMo4 / SCM440 Hardness : HRc20	
Cutting Speed	98.4 ft/min.	
RPM	1592 rev./min.	
Tapping Depth	.5906" (2.5xD / Through Hole)	
Tapping Holes	420	
Cooling Method	External Cooling Water Soluble (9% Emulsion)	
Machine	Machining Center	



Synchro TAP



Competitor



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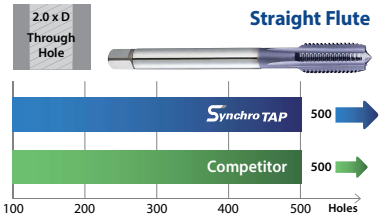
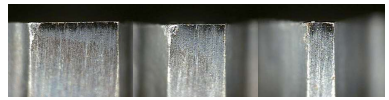
▶ STRAIGHT FLUTE TAP M10 x 1.5

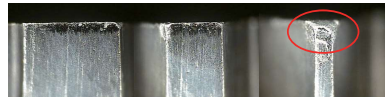
Tool	Synchro TAP Straight Flute Tap	Competitor
Size	M10 x 1.5	
Work Material	4140 / 42CrMo4 / SCM440 Hardness : HRc20	
Cutting Speed	82.0 ft/min.	
RPM	1326 rev./min.	
Tapping Depth	.7874" (2.0xD / Through Hole)	
Tapping Holes	500	
Cooling Method	External Cooling Water Soluble (9% Emulsion)	
Machine	Machining Center	



Synchro TAP

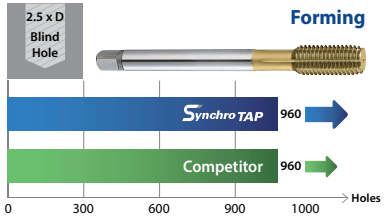


Competitor

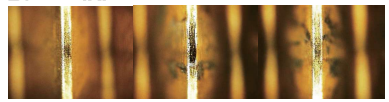


▶ SPIRAL POINT TAP M6 x 1.0

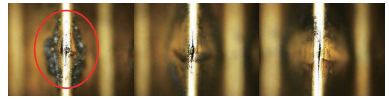
Tool	Synchro TAP Forming Tap	Competitor
Size	M6 x 1.0	
Work Material	1045 / C45 / S45C Hardness : HRc20	
Cutting Speed	114.8 ft/min.	
RPM	1857 rev./min.	
Tapping Depth	.5906" (2.5xD / Blind Hole)	
Tapping Holes	960	
Cooling Method	External Cooling Water Soluble (9% Emulsion)	
Machine	Machining Center	



Synchro TAP



Competitor



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SELECTION GUIDE

HSS-PM
SYNCHRO TAPS

High Speed Tapping with Rigid CNC Machines

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : P.21

HOLE TYPE					Max. 2.5xD Blind Hole		Max. 3.0xD Through Hole		Max. 2.0xD Blind / Through Hole		Max. 3.0xD Blind / Through Hole		SYNCHRO TAPPING CHUCK (ER TYPE)
TOOL MATERIAL					HSS-PM		HSS-PM		HSS-PM		HSS-PM		
CHAMFER LEAD ACC. TO DIN2197					2p-3p		4p-5p		2p-3p		2p-3p		
FLUTE TYPE					Spiral Flute	Spiral Flute	Spiral Point	Spiral Point	Straight Flute	Straight Flute	Forming	Forming	
SPIRAL FLUTE ANGLE					R45	R45	-	-	-	-	-	-	
SERIES	M												
	M/MF					TTS61 (P.10)		TTS62 (P.13)		TKS63 (P.16)		TTS64 (P.19)	
	UNC												
	UNC/UNF				TTS65 (P.8)		TTS66 (P.11)		TKS67 (P.14)		TTS68 (P.17)		CAT (P.20)
	UNC/UNF/UNS												
	UNC/UN8												
	NPT												
	NPTF												
	NPS/NPSF												
SURFACE TREATMENT / COATING					TiN	TiN	TiN	TiN	TiCN	TiCN	TiN	TiN	
MODEL													

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB								
P	1	Non-alloy steel	About 0.15% C	Annealed	125	◎	◎	◎	◎	○	○	◎	◎
	2		About 0.45% C	Annealed	190	◎	◎	◎	◎	○	○	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	◎	◎	◎	◎	○	○	◎	◎
	4		About 0.75% C	Annealed	270	◎	◎	◎	◎	○	○	◎	◎
	5		About 0.75% C	Quenched & Tempered	300								
	6	Low alloy steel		Annealed	180	◎	◎	◎	◎	○	○	◎	◎
	7			Quenched & Tempered	275	◎	◎	◎	◎	○	○	◎	◎
	8			Quenched & Tempered	300								
	9			Quenched & Tempered	350								
	10	High alloyed steel, and tool steel		Annealed	200								
	11			Quenched & Tempered	325								
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	◎	◎	◎	◎			◎	◎
	13		Martensitic	Quenched & Tempered	240	◎	◎	◎	◎			◎	◎
	14		Austenitic		180	○	○	○	○			◎	◎
K	15	Grey cast iron	Pearlitic / ferritic		180	○	○	○	○	◎	◎		
	16		Pearlitic (Martensitic)		260					◎	◎		
	17	Nodular cast iron	Ferritic		160	◎	◎	◎	◎	◎	◎		
	18		Pearlitic		250					◎	◎		
	19	Malleable cast iron	Ferritic		130					○	○		
	20		Pearlitic		230					○	○		
N	21	Aluminum-wrought alloy	Not Curable		60							◎	◎
	22		Curable	Hardened	100							◎	◎
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75	◎	◎	◎	◎	○	○	◎	◎
	24		≤ 12% Si, Curable	Hardened	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								
	32			Cured	280								
	33		Ni or Co Based	Annealed	250								
	34			Cured	350								
	35			Cast	320								
	36	Titanium Alloys	Pure Titanium		400 Rm								
	37		Alpha + Beta Alloys	Hardened	1050 Rm								
H	38	Hardened steel		Hardened	550								
	39			Hardened	630								
	40	Chilled Cast Iron		Cast	400								
	41	Hardened Cast Iron		Hardened	550								

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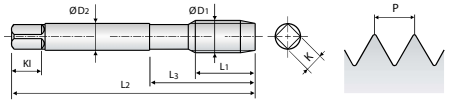
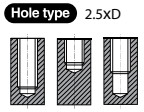
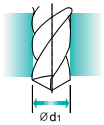
UNC/UNF TiN-COATED HSS-PM SYNCHRO TAPS SPIRAL FLUTE for High Speed Tapping — TTS65 SERIES

- 2-3 times faster when tapping the GS material group
- Precision Threads
- Unsurpassed chip handling



Hole type 2.5xD





Refer to P.24-37 for tap drill sizes

Material groups: GS — HSS PM | UNC UNF | H | 60° | R45° | 2P~3P | TiN

Unit : inch

Size	TPI	EDP No.	Limit	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute
ØD1	P	TiN		L1	L2	L3	ØD2	K	Kl	Z
#4	40 UNC	**TTS65162**	H2	.250	1.88	.563	.141	.110	.190	3
#4	48 UNF	**TTS65181**	H1	.209	1.88	.563	.141	.110	.190	3
#4	48 UNF	**TTS65182**	H2	.209	1.88	.563	.141	.110	.190	3
#5	40 UNC	**TTS65202**	H2	.250	1.94	.626	.141	.110	.190	3
#5	44 UNF	**TTS65221**	H1	.227	1.94	.626	.141	.110	.190	3
#5	44 UNF	**TTS65222**	H2	.227	1.94	.626	.141	.110	.190	3
#6	32 UNC	**TTS65242**	H2	.313	2.00	.689	.141	.110	.190	3
#6	32 UNC	**TTS65243**	H3	.313	2.00	.689	.141	.110	.190	3
#6	40 UNF	**TTS65262**	H2	.250	2.00	.689	.141	.110	.190	3
#8	32 UNC	**TTS65282**	H2	.313	2.13	.752	.168	.131	.250	3
#8	32 UNC	**TTS65283**	H3	.313	2.13	.752	.168	.131	.250	3
#8	36 UNF	**TTS65302**	H2	.278	2.13	.752	.168	.131	.250	3
#10	24 UNC	**TTS65323**	H3	.417	2.38	.906	.194	.152	.250	3
#10	32 UNF	**TTS65342**	H2	.313	2.38	.906	.194	.152	.250	3
#10	32 UNF	**TTS65343**	H3	.313	2.38	.906	.194	.152	.250	3
#12	24 UNC	**TTS65363**	H3	.417	2.38	.906	.220	.165	.280	3
#12	28 UNF	**TTS65383**	H3	.357	2.38	.906	.220	.165	.280	3
1/4	20 UNC	**TTS65403**	H3	.500	2.50	1.000	.255	.191	.310	3
1/4	20 UNC	**TTS65405**	H5	.500	2.50	1.000	.255	.191	.310	3
1/4	28 UNF	**TTS65423**	H3	.357	2.50	1.000	.255	.191	.310	3
1/4	28 UNF	**TTS65424**	H4	.357	2.50	1.000	.255	.191	.310	3
5/16	18 UNC	**TTS65443**	H3	.556	2.72	1.126	.318	.238	.380	3
5/16	18 UNC	**TTS65445**	H5	.556	2.72	1.126	.318	.238	.380	3
5/16	24 UNF	**TTS65463**	H3	.417	2.72	1.126	.318	.238	.380	3

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P																				
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	400 Rm	1050 Rm	550	630	400	550
Recommended			◎	◎	◎	◎		○													

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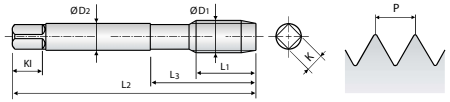
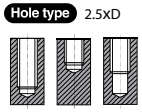
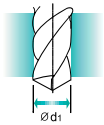


Hole type 2.5xD





Refer to P.24-37 for tap drill sizes

Material groups: GS — HSS PM | UNC UNF | H | 60° | R45° | 2P~3P | TiN

Unit : inch

Size	TPI	EDP No.	Limit	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute
ØD1	P	TiN		L1	L2	L3	ØD2	K	Kl	Z
5/16	24 UNF	**TTS65464**	H4	.417	2.72	1.126	.318	.238	.380	3
3/8	16 UNC	**TTS65483**	H3	.625	2.94	1.252	.381	.286	.440	3
3/8	16 UNC	**TTS65485**	H5	.625	2.94	1.252	.381	.286	.440	3
3/8	24 UNF	**TTS65503**	H3	.417	2.94	1.252	.381	.286	.440	3
3/8	24 UNF	**TTS65504**	H4	.417	2.94	1.252	.381	.286	.440	3
7/16	14 UNC	**TTS65523**	H3	.714	3.16	1.850	.323	.242	.410	3
7/16	14 UNC	**TTS65525**	H5	.714	3.16	1.850	.323	.242	.410	3
7/16	20 UNF	**TTS65543**	H3	.500	3.16	1.850	.323	.242	.410	3
7/16	20 UNF	**TTS65545**	H5	.500	3.16	1.850	.323	.242	.410	3
1/2	13 UNC	**TTS65563**	H3	.769	3.38	2.067	.367	.275	.440	3
1/2	13 UNC	**TTS65565**	H5	.769	3.38	2.067	.367	.275	.440	3
1/2	20 UNF	**TTS65583**	H3	.500	3.38	2.067	.367	.275	.440	3
1/2	20 UNF	**TTS65585**	H5	.500	3.38	2.067	.367	.275	.440	3
9/16	12 UNC	**TTS65603**	H3	.833	3.59	2.067	.429	.322	.500	3
9/16	12 UNC	**TTS65605**	H5	.833	3.59	2.067	.429	.322	.500	3
9/16	18 UNF	**TTS65623**	H3	.556	3.59	2.067	.429	.322	.500	3
9/16	18 UNF	**TTS65625**	H5	.556	3.59	2.067	.429	.322	.500	3
5/8	11 UNC	**TTS65643**	H3	.909	3.81	2.205	.480	.360	.560	3
5/8	11 UNC	**TTS65645**	H5	.909	3.81	2.205	.480	.360	.560	3
5/8	18 UNF	**TTS65663**	H3	.556	3.81	2.205	.480	.360	.560	3
5/8	18 UNF	**TTS65665**	H5	.556	3.81	2.205	.480	.360	.560	3
3/4	10 UNC	**TTS65705**	H5	1.000	4.25	2.480	.590	.442	.690	4
3/4	16 UNF	**TTS65723**	H3	.625	4.25	2.480	.590	.442	.690	4
3/4	16 UNF	**TTS65725**	H5	.625	4.25	2.480	.590	.442	.690	4

◎ : Excellent ○ : Good

ISO	P																				
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	400 Rm	1050 Rm	550	630	400	550
Recommended			◎	◎	◎	◎		○													

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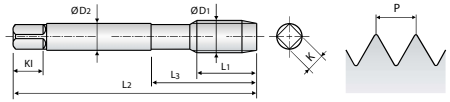
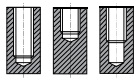
- 2-3 times faster when tapping the GS material group
- Precision Threads
- Unsurpassed chip handling



Hole type 2.5xD



Refer to P.24-37 for tap drill sizes

Material groups: GS | HSS PM | M MF | D | 60° | R45° | 2P~3P | TiN

Unit : inch

Size	Pitch	EDP No.	Limit	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute
ØD1	P	TiN		L1	L2	L3	ØD2	K	Kl	Z
M3	x 0.5	TTS61203	D3	.197	1.94	.646	.141	.110	.190	3
M4	x 0.7	TTS61244	D4	.276	2.13	.768	.168	.131	.250	3
M5	x 0.8	TTS61284	D4	.315	2.38	.933	.194	.152	.250	3
M6	x 1.0	TTS61315	D5	.394	2.50	1.000	.255	.191	.310	3
M8	x 1.25	TTS61365	D5	.512	2.72	1.126	.318	.238	.380	3
M8	x 1.0	TTS61375	D5	.394	2.72	1.126	.318	.238	.380	3
M10	x 1.5	TTS61426	D6	.591	2.94	1.252	.381	.286	.440	3
M10	x 1.25	TTS61435	D5	.512	2.94	1.252	.381	.286	.440	3
M12	x 1.75	TTS61506	D6	.709	3.38	2.067	.367	.275	.440	3
M12	x 1.25	TTS61525	D5	.512	3.38	2.067	.367	.275	.440	3
M14	x 2.0	TTS61547	D7	.787	3.59	2.067	.429	.322	.500	3
M14	x 1.5	TTS61556	D6	.591	3.59	2.067	.429	.322	.500	3
M16	x 2.0	TTS61607	D7	.787	3.81	2.205	.480	.360	.560	3
M16	x 1.5	TTS61616	D6	.591	3.81	2.205	.480	.360	.560	3
M18	x 2.5	TTS61657	D7	.984	4.03	2.205	.542	.406	.630	4
M18	x 1.5	TTS61676	D6	.591	4.03	2.205	.542	.406	.630	4
M20	x 2.5	TTS61707	D7	.984	4.47	2.480	.652	.489	.690	4
M20	x 1.5	TTS61726	D6	.591	4.47	2.480	.652	.489	.690	4

◎ : Excellent ○ : Good

ISO	P																				
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		M Stainless steel			K Grey cast iron		K Nodular cast iron		K 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	400 Rm	1050 Rm	550	630	400	550
Recommended			◎	◎	◎	◎		○													

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- 2-3 times faster when tapping the GS material group
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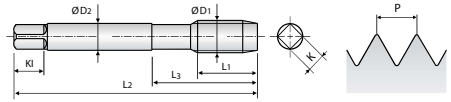
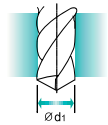
- Unsurpassed chip handling



Hole type 3.0xD



Refer to P.24-37 for tap drill sizes

Material groups: GS | HSS PM | UNC UNF | H | 60° | 4P~5P | TiN

Unit : inch

Size	TPI	EDP No.	Limit	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute
ØD1	P	TiN		L1	L2	L3	ØD2	K	Kl	Z
#4	- 40 UNC	TTS66162	H2	.250	1.88	.563	.141	.110	.190	3
#4	- 48 UNF	TTS66181	H1	.209	1.88	.563	.141	.110	.190	3
#4	- 48 UNF	TTS66182	H2	.209	1.88	.563	.141	.110	.190	3
#5	- 40 UNC	TTS66202	H2	.250	1.94	.626	.141	.110	.190	3
#5	- 44 UNF	TTS66221	H1	.227	1.94	.626	.141	.110	.190	3
#5	- 44 UNF	TTS66222	H2	.227	1.94	.626	.141	.110	.190	3
#6	- 32 UNC	TTS66242	H2	.313	2.00	.689	.141	.110	.190	3
#6	- 32 UNC	TTS66243	H3	.313	2.00	.689	.141	.110	.190	3
#6	- 40 UNF	TTS66262	H2	.250	2.00	.689	.141	.110	.190	3
#8	- 32 UNC	TTS66282	H2	.313	2.13	.752	.168	.131	.250	3
#8	- 32 UNC	TTS66283	H3	.313	2.13	.752	.168	.131	.250	3
#8	- 36 UNF	TTS66302	H2	.278	2.13	.752	.168	.131	.250	3
#10	- 24 UNC	TTS66323	H3	.417	2.38	.906	.194	.152	.250	3
#10	- 32 UNF	TTS66342	H2	.313	2.38	.906	.194	.152	.250	3
#10	- 32 UNF	TTS66343	H3	.313	2.38	.906	.194	.152	.250	3
#12	- 24 UNC	TTS66363	H3	.417	2.38	.906	.220	.165	.280	3
#12	- 28 UNF	TTS66383	H3	.357	2.38	.906	.220	.165	.280	3
1/4	- 20 UNC	TTS66403	H3	.500	2.50	1.000	.255	.191	.310	3
1/4	- 20 UNC	TTS66405	H5	.500	2.50	1.000	.255	.191	.310	3
1/4	- 28 UNF	TTS66423	H3	.357	2.50	1.000	.255	.191	.310	3
1/4	- 28 UNF	TTS66424	H4	.357	2.50	1.000	.255	.191	.310	3
5/16	- 18 UNC	TTS66443	H3	.556	2.72	1.126	.318	.238	.380	3
5/16	- 18 UNC	TTS66445	H5	.556	2.72	1.126	.318	.238	.380	3
5/16	- 24 UNF	TTS66463	H3	.417	2.72	1.126	.318	.238	.380	3

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P																				
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		M Stainless steel			K Grey cast iron		K Nodular cast iron		K 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	400 Rm	1050 Rm	550	630	400	550
Recommended			◎	◎	◎	◎		○													

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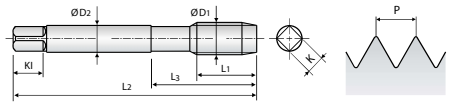
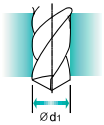
- 2-3 times faster when tapping the GS material group
- Precision Threads
- Unsurpassed chip handling



Hole type 3.0xD



Refer to P.24-37 for tap drill sizes

Material groups: GS | HSS PM | UNC UNF | H | 60° | 4P~5P | TiN

Unit : inch

Size	TPI	EDP No.	Limit	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute
ØD1	P	TiN		L1	L2	L3	ØD2	K	Kl	Z
5/16	- 24 UNF	**TTS66464**	H4	.417	2.72	1.126	.318	.238	.380	3
3/8	- 16 UNC	**TTS66483**	H3	.625	2.94	1.252	.381	.286	.440	3
3/8	- 16 UNC	**TTS66485**	H5	.625	2.94	1.252	.381	.286	.440	3
3/8	- 24 UNF	**TTS66503**	H3	.417	2.94	1.252	.381	.286	.440	3
3/8	- 24 UNF	**TTS66504**	H4	.417	2.94	1.252	.381	.286	.440	3
7/16	- 14 UNC	**TTS66523**	H3	.714	3.16	1.850	.323	.242	.410	4
7/16	- 14 UNC	**TTS66525**	H5	.714	3.16	1.850	.323	.242	.410	4
7/16	- 20 UNF	**TTS66543**	H3	.500	3.16	1.850	.323	.242	.410	4
7/16	- 20 UNF	**TTS66545**	H5	.500	3.16	1.850	.323	.242	.410	4
1/2	- 13 UNC	**TTS66563**	H3	.769	3.38	2.067	.367	.275	.440	4
1/2	- 13 UNC	**TTS66565**	H5	.769	3.38	2.067	.367	.275	.440	4
1/2	- 20 UNF	**TTS66583**	H3	.500	3.38	2.067	.367	.275	.440	4
1/2	- 20 UNF	**TTS66585**	H5	.500	3.38	2.067	.367	.275	.440	4
9/16	- 12 UNC	**TTS66603**	H3	.833	3.59	2.067	.429	.322	.500	4
9/16	- 12 UNC	**TTS66605**	H5	.833	3.59	2.067	.429	.322	.500	4
9/16	- 18 UNF	**TTS66623**	H3	.556	3.59	2.067	.429	.322	.500	4
9/16	- 18 UNF	**TTS66625**	H5	.556	3.59	2.067	.429	.322	.500	4
5/8	- 11 UNC	**TTS66643**	H3	.909	3.81	2.205	.480	.360	.560	4
5/8	- 11 UNC	**TTS66645**	H5	.909	3.81	2.205	.480	.360	.560	4
5/8	- 18 UNF	**TTS66663**	H3	.556	3.81	2.205	.480	.360	.560	4
5/8	- 18 UNF	**TTS66665**	H5	.556	3.81	2.205	.480	.360	.560	4
3/4	- 10 UNC	**TTS66703**	H3	1.000	4.25	2.480	.590	.442	.690	4
3/4	- 10 UNC	**TTS66705**	H5	1.000	4.25	2.480	.590	.442	.690	4
3/4	- 16 UNF	**TTS66723**	H3	.625	4.25	2.480	.590	.442	.690	4
3/4	- 16 UNF	**TTS66725**	H5	.625	4.25	2.480	.590	.442	.690	4

◎ : Excellent ○ : Good

ISO	P																				
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		M Stainless steel			K 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	400 Rm	1050 Rm	550	630	400	550
Recommended			◎	◎	◎	◎		○													

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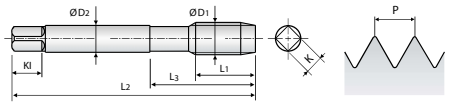
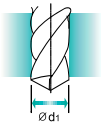
- 2-3 times faster when tapping the GS material group
- Precision Threads
- Unsurpassed chip handling



Hole type 3.0xD



Refer to P.24-37 for tap drill sizes

Material groups: GS | HSS PM | M MF | D | 60° | 4P~5P | TiN

Unit : inch

Size	Pitch	EDP No.	Limit	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute
ØD1	P	TiN		L1	L2	L3	ØD2	K	Kl	Z
M3	x 0.5	**TTS62203**	D3	.197	1.94	.646	.141	.110	.190	3
M4	x 0.7	**TTS62244**	D4	.276	2.13	.768	.168	.131	.250	3
M5	x 0.8	**TTS62284**	D4	.315	2.38	.933	.194	.152	.250	3
M6	x 1.0	**TTS62315**	D5	.394	2.50	1.000	.255	.191	.310	3
M8	x 1.25	**TTS62365**	D5	.512	2.72	1.126	.318	.238	.380	3
M8	x 1.0	**TTS62375**	D5	.394	2.72	1.126	.318	.238	.380	3
M10	x 1.5	**TTS62426**	D6	.591	2.94	1.252	.381	.286	.440	3
M10	x 1.25	**TTS62435**	D5	.512	2.94	1.252	.381	.286	.440	3
M12	x 1.75	**TTS62506**	D6	.709	3.38	2.067	.367	.275	.440	4
M12	x 1.25	**TTS62525**	D5	.512	3.38	2.067	.367	.275	.440	4
M14	x 2.0	**TTS62547**	D7	.787	3.59	2.067	.429	.322	.500	4
M14	x 1.5	**TTS62556**	D6	.591	3.59	2.067	.429	.322	.500	4
M16	x 2.0	**TTS62607**	D7	.787	3.81	2.205	.480	.360	.560	4
M16	x 1.5	**TTS21616**	D6	.591	3.81	2.205	.480	.360	.560	4
M18	x 2.5	**TTS62657**	D7	.984	4.03	2.205	.542	.406	.630	4
M18	x 1.5	**TTS62676**	D6	.591	4.03	2.205	.542	.406	.630	4
M20	x 2.5	**TTS62707**	D7	.984	4.47	2.480	.652	.489	.690	4
M20	x 1.5	**TTS62726**	D6	.591	4.47	2.480	.652	.489	.690	4

◎ : Excellent ○ : Good

ISO	P																				
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		M Stainless steel			K 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	400 Rm	1050 Rm	550	630	400	550
Recommended			◎	◎	◎	◎		○													

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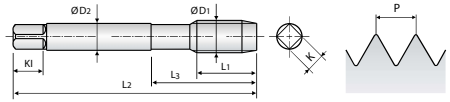
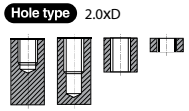
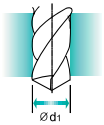
- 2-3 times faster when tapping the GG material group
- Precision Threads
- Unsurpassed chip handling



Hole type 2.0xD





Refer to P.24-37 for tap drill sizes

Material groups **GG** | HSS PM | UNC UNF | H | 60° | 2P~3P | TiCN

Unit : inch

Size TPI	EDP No.	Limit	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute
ØD1 P	TiN		L1	L2	L3	ØD2	K	Kl	Z
#4 - 40 UNC	**TKS67162**	H2	.250	1.88	.563	.141	.110	.190	3
#4 - 48 UNF	**TKS67181**	H1	.209	1.88	.563	.141	.110	.190	3
#4 - 48 UNF	**TKS67182**	H2	.209	1.88	.563	.141	.110	.190	3
#5 - 40 UNC	**TKS67202**	H2	.250	1.94	.626	.141	.110	.190	3
#5 - 44 UNF	**TKS67221**	H1	.227	1.94	.626	.141	.110	.190	3
#5 - 44 UNF	**TKS67222**	H2	.227	1.94	.626	.141	.110	.190	3
#6 - 32 UNC	**TKS67242**	H2	.313	2.00	.689	.141	.110	.190	3
#6 - 32 UNC	**TKS67243**	H3	.313	2.00	.689	.141	.110	.190	3
#6 - 40 UNF	**TKS67262**	H2	.250	2.00	.689	.141	.110	.190	3
#8 - 32 UNC	**TKS67282**	H2	.313	2.13	.752	.168	.131	.250	3
#8 - 32 UNC	**TKS67283**	H3	.313	2.13	.752	.168	.131	.250	3
#8 - 36 UNF	**TKS67302**	H2	.278	2.13	.752	.168	.131	.250	3
#10 - 24 UNC	**TKS67323**	H3	.417	2.38	.906	.194	.152	.250	3
#10 - 32 UNF	**TKS67342**	H2	.313	2.38	.906	.194	.152	.250	3
#10 - 32 UNF	**TKS67343**	H3	.313	2.38	.906	.194	.152	.250	3
#12 - 24 UNC	**TKS67363**	H3	.417	2.38	.906	.220	.165	.280	3
#12 - 28 UNF	**TKS67383**	H3	.357	2.38	.906	.220	.165	.280	3
1/4 - 20 UNC	**TKS67403**	H3	.500	2.50	1.000	.255	.191	.310	3
1/4 - 20 UNC	**TKS67405**	H5	.500	2.50	1.000	.255	.191	.310	3
1/4 - 28 UNF	**TKS67423**	H3	.357	2.50	1.000	.255	.191	.310	3
1/4 - 28 UNF	**TKS67424**	H4	.357	2.50	1.000	.255	.191	.310	3
5/16 - 18 UNC	**TKS67443**	H3	.556	2.72	1.126	.318	.238	.380	3
5/16 - 18 UNC	**TKS67445**	H5	.556	2.72	1.126	.318	.238	.380	3
5/16 - 24 UNF	**TKS67463**	H3	.417	2.72	1.126	.318	.238	.380	3

▶ NEXT PAGE

◎ : 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	400 Rm	1050 Rm	550	630	400	550
Recommended			○	○	○																

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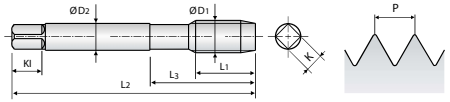
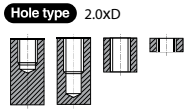
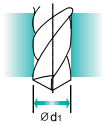


Hole type 2.0xD





Refer to P.24-37 for tap drill sizes

Material groups **GG** | HSS PM | UNC UNF | H | 60° | 2P~3P | TiCN

Unit : inch

Size TPI	EDP No.	Limit	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute
ØD1 P	TiN		L1	L2	L3	ØD2	K	Kl	Z
5/16 - 24 UNF	**TKS67464**	H4	.417	2.72	1.126	.318	.238	.380	3
3/8 - 16 UNC	**TKS67483**	H3	.625	2.94	1.252	.381	.286	.440	4
3/8 - 16 UNC	**TKS67485**	H5	.625	2.94	1.252	.381	.286	.440	4
3/8 - 24 UNF	**TKS67503**	H3	.417	2.94	1.252	.381	.286	.440	4
3/8 - 24 UNF	**TKS67504**	H4	.417	2.94	1.252	.381	.286	.440	4
7/16 - 14 UNC	**TKS67523**	H3	.714	3.16	1.850	.323	.242	.410	4
7/16 - 14 UNC	**TKS67525**	H5	.714	3.16	1.850	.323	.242	.410	4
7/16 - 20 UNF	**TKS67543**	H3	.500	3.16	1.850	.323	.242	.410	4
7/16 - 20 UNF	**TKS67545**	H5	.500	3.16	1.850	.323	.242	.410	4
1/2 - 13 UNC	**TKS67563**	H3	.769	3.38	2.067	.367	.275	.440	4
1/2 - 13 UNC	**TKS67565**	H5	.769	3.38	2.067	.367	.275	.440	4
1/2 - 20 UNF	**TKS67583**	H3	.500	3.38	2.067	.367	.275	.440	4
1/2 - 20 UNF	**TKS67585**	H5	.500	3.38	2.067	.367	.275	.440	4
9/16 - 12 UNC	**TKS67603**	H3	.833	3.59	2.067	.429	.322	.500	4
9/16 - 12 UNC	**TKS67605**	H5	.833	3.59	2.067	.429	.322	.500	4
9/16 - 18 UNF	**TKS67623**	H3	.556	3.59	2.067	.429	.322	.500	4
9/16 - 18 UNF	**TKS67625**	H5	.556	3.59	2.067	.429	.322	.500	4
5/8 - 11 UNC	**TKS67643**	H3	.909	3.81	2.205	.480	.360	.560	4
5/8 - 11 UNC	**TKS67645**	H5	.909	3.81	2.205	.480	.360	.560	4
5/8 - 18 UNF	**TKS67663**	H3	.556	3.81	2.205	.480	.360	.560	4
5/8 - 18 UNF	**TKS67665**	H5	.556	3.81	2.205	.480	.360	.560	4
3/4 - 10 UNC	**TKS67703**	H3	1.000	4.25	2.480	.590	.442	.690	4
3/4 - 10 UNC	**TKS67705**	H5	1.000	4.25	2.480	.590	.442	.690	4
3/4 - 16 UNF	**TKS67723**	H3	.625	4.25	2.480	.590	.442	.690	4
3/4 - 16 UNF	**TKS67725**	H5	.625	4.25	2.480	.590	.442	.690	4

◎ : 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	400 Rm	1050 Rm	550	630	400	550
Recommended			○	○	○																

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M/MF TiCN-COATED HSS-PM SYNCHRO TAPS
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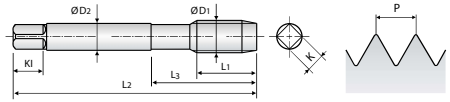
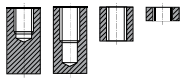
- 2-3 times faster when tapping the GG material group
- Precision Threads
- Unsurpassed chip handling



Hole type 2.0xD



Refer to P.24-37 for tap drill sizes

Material groups **GG** | HSS PM | M MF | D | 60° | 2P~3P | TiCN

Unit : inch

Size ØD1	Pitch P	EDP No. TiN	Limit	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z
M3	x 0.5	**TKS63203**	D3	.197	1.94	.646	.141	.110	.190	3
M4	x 0.7	**TKS63244**	D4	.276	2.13	.768	.168	.131	.250	3
M5	x 0.8	**TKS63284**	D4	.315	2.38	.933	.194	.152	.250	3
M6	x 1.0	**TKS63315**	D5	.394	2.50	1.000	.255	.191	.310	3
M8	x 1.25	**TKS63365**	D5	.512	2.72	1.126	.318	.238	.380	3
M8	x 1.0	**TKS63375**	D5	.394	2.72	1.126	.318	.238	.380	3
M10	x 1.5	**TKS63426**	D6	.591	2.94	1.252	.381	.286	.440	4
M10	x 1.25	**TKS63435**	D5	.512	2.94	1.252	.381	.286	.440	4
M12	x 1.75	**TKS63506**	D6	.709	3.38	2.067	.367	.275	.440	4
M12	x 1.25	**TKS63525**	D5	.512	3.38	2.067	.367	.275	.440	4
M14	x 2.0	**TKS63547**	D7	.787	3.59	2.067	.429	.322	.500	4
M14	x 1.5	**TKS63556**	D6	.591	3.59	2.067	.429	.322	.500	4
M16	x 2.0	**TKS63607**	D7	.787	3.81	2.205	.480	.360	.560	4
M16	x 1.5	**TKS63616**	D6	.591	3.81	2.205	.480	.360	.560	4
M18	x 2.5	**TKS63657**	D7	.984	4.03	2.205	.542	.406	.630	4
M18	x 1.5	**TKS63676**	D6	.591	4.03	2.205	.542	.406	.630	4
M20	x 2.5	**TKS63707**	D7	.984	4.47	2.480	.652	.489	.690	4
M20	x 1.5	**TKS63726**	D6	.591	4.47	2.480	.652	.489	.690	4

◎ : Excellent ○ : Good

ISO	P																				
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		M Stainless steel				K 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	400 Rm	1050 Rm	550	630	400	550
Recommended			○	○	○																

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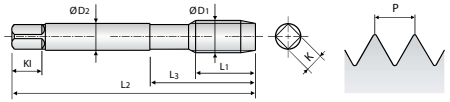
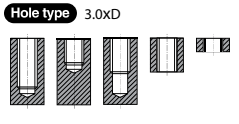
UNC/UNF TiN-COATED HSS-PM SYNCHRO TAPS
FORMING for High Speed Tapping — TTS68 SERIES

- 2-3 times faster when machining the GV material group
- Precision Threads



Hole type 3.0xD



Refer to P.24-37 for tap drill sizes

Material groups **GV** | HSS PM | UNC UNF | H | 60° | 2P~3P | TiN

Unit : inch

Size ØD1	TPI	EDP No. TiN	Limit	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z
#4	- 40 UNC	**TTS68163**	H3	.250	1.88	.563	.141	.110	.190	4
#4	- 40 UNC	**TTS68165**	H5	.250	1.88	.563	.141	.110	.190	4
#4	- 48 UNF	**TTS68183**	H3	.209	1.88	.563	.141	.110	.190	4
#4	- 48 UNF	**TTS68185**	H5	.209	1.88	.563	.141	.110	.190	4
#5	- 40 UNC	**TTS68203**	H3	.250	1.94	.626	.141	.110	.190	5
#5	- 40 UNC	**TTS68205**	H5	.250	1.94	.626	.141	.110	.190	5
#5	- 44 UNF	**TTS68223**	H3	.227	1.94	.626	.141	.110	.190	5
#5	- 44 UNF	**TTS68225**	H5	.227	1.94	.626	.141	.110	.190	5
#6	- 32 UNC	**TTS68243**	H3	.313	2.00	.689	.141	.110	.190	5
#6	- 32 UNC	**TTS68245**	H5	.313	2.00	.689	.141	.110	.190	5
#6	- 40 UNF	**TTS68263**	H3	.250	2.00	.689	.141	.110	.190	5
#6	- 40 UNF	**TTS68265**	H5	.250	2.00	.689	.141	.110	.190	5
#8	- 32 UNC	**TTS68283**	H3	.313	2.13	.752	.168	.131	.250	5
#8	- 32 UNC	**TTS68285**	H5	.313	2.13	.752	.168	.131	.250	5
#8	- 36 UNF	**TTS68303**	H3	.278	2.13	.752	.168	.131	.250	5
#8	- 36 UNF	**TTS68305**	H5	.278	2.13	.752	.168	.131	.250	5
#10	- 24 UNC	**TTS68324**	H4	.417	2.38	.906	.194	.152	.250	5
#10	- 24 UNC	**TTS68326**	H6	.417	2.38	.906	.194	.152	.250	5
#10	- 32 UNF	**TTS68344**	H4	.313	2.38	.906	.194	.152	.250	5
#10	- 32 UNF	**TTS68346**	H6	.313	2.38	.906	.194	.152	.250	5
#12	- 24 UNC	**TTS68364**	H4	.417	2.38	.906	.220	.165	.280	5
#12	- 24 UNC	**TTS68366**	H6	.417	2.38	.906	.220	.165	.280	5
1/4	- 20 UNC	**TTS68404**	H4	.500	2.50	1.000	.255	.191	.310	5
1/4	- 20 UNC	**TTS68406**	H6	.500	2.50	1.000	.255	.191	.310	5
1/4	- 28 UNF	**TTS68424**	H4	.357	2.50	1.000	.255	.191	.310	5
1/4	- 28 UNF	**TTS68426**	H6	.357	2.50	1.000	.255	.191	.310	5

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P																				
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		M Stainless steel				K 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	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	○			◎													

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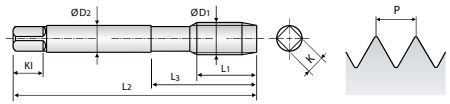
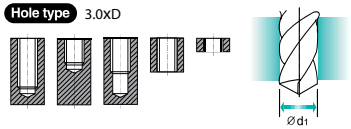
UNC/UNF TiN-COATED HSS-PM SYNCHRO TAPS FORMING for High Speed Tapping

TTS68 SERIES

- 2-3 times faster when machining the GV material group
- Precision Threads



Hole type 3.0xD



Material groups **GV** | HSS PM | UNC UNF | H | 60° | 2P~3P | TiN

Refer to P.24-37 for tap drill sizes

Unit : inch

Size	TPI	EDP No.	Limit	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute
ØD1	P	TiN		L1	L2	L3	ØD2	K	Kl	Z
5/16	18 UNC	**TTS68445**	H5	.556	2.72	1.126	.318	.238	.380	5
5/16	18 UNC	**TTS68447**	H7	.556	2.72	1.126	.318	.238	.380	5
5/16	24 UNF	**TTS68465**	H5	.417	2.72	1.126	.318	.238	.380	5
5/16	24 UNF	**TTS68467**	H7	.417	2.72	1.126	.318	.238	.380	5
3/8	16 UNC	**TTS68485**	H5	.625	2.94	1.252	.381	.286	.440	6
3/8	16 UNC	**TTS68487**	H7	.625	2.94	1.252	.381	.286	.440	6
3/8	24 UNF	**TTS68505**	H5	.417	2.94	1.252	.381	.286	.440	6
3/8	24 UNF	**TTS68507**	H7	.417	2.94	1.252	.381	.286	.440	6
7/16	14 UNC	**TTS68525**	H5	.714	3.16	1.850	.323	.242	.410	6
7/16	14 UNC	**TTS68528**	H8	.714	3.16	1.850	.323	.242	.410	6
7/16	20 UNF	**TTS68545**	H5	.500	3.16	1.850	.323	.242	.410	6
7/16	20 UNF	**TTS68548**	H8	.500	3.16	1.850	.323	.242	.410	6
1/2	13 UNC	**TTS68566**	H6	.769	3.38	2.067	.367	.275	.440	6
1/2	13 UNC	**TTS68568**	H8	.769	3.38	2.067	.367	.275	.440	6
1/2	20 UNF	**TTS68585**	H5	.500	3.38	2.067	.367	.275	.440	6
1/2	20 UNF	**TTS68588**	H8	.500	3.38	2.067	.367	.275	.440	6
9/16	12 UNC	**TTS68607**	H7	.833	3.59	2.067	.429	.322	.500	8
9/16	12 UNC	**TTS68600**	H10	.833	3.59	2.067	.429	.322	.500	8
9/16	18 UNF	**TTS68627**	H7	.556	3.59	2.067	.429	.322	.500	8
9/16	18 UNF	**TTS68620**	H10	.556	3.59	2.067	.429	.322	.500	8
5/8	11 UNC	**TTS68647**	H7	.909	3.81	2.205	.480	.360	.560	8
5/8	11 UNC	**TTS68640**	H10	.909	3.81	2.205	.480	.360	.560	8
5/8	18 UNF	**TTS68667**	H7	.556	3.81	2.205	.480	.360	.560	8
5/8	18 UNF	**TTS68660**	H10	.556	3.81	2.205	.480	.360	.560	8
3/4	10 UNC	**TTS68707**	H7	1.000	4.25	2.480	.590	.442	.690	8
3/4	10 UNC	**TTS68700**	H10	1.000	4.25	2.480	.590	.442	.690	8
3/4	16 UNF	**TTS68727**	H7	.625	4.25	2.480	.590	.442	.690	8
3/4	16 UNF	**TTS68720**	H10	.625	4.25	2.480	.590	.442	.690	8

◎ : 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	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	○			◎													

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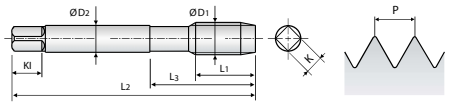
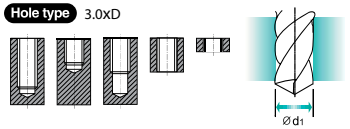
M/MF TiN-COATED HSS-PM SYNCHRO TAPS FORMING for High Speed Tapping

TTS64 SERIES

- 2-3 times faster when machining the GV material group
- Precision Threads



Hole type 3.0xD



Material groups **GV** | HSS PM | M MF | D | 60° | 2P~3P | TiN

Refer to P.24-37 for tap drill sizes

Unit : inch

Size	Pitch	EDP No.	Limit	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Lobe
ØD1	P	TiN		L1	L2	L3	ØD2	K	Kl	Z
M3 x	0.5	**TTS64205**	D5	.197	1.94	.646	.141	.110	.190	5
M4 x	0.7	**TTS64246**	D6	.276	2.13	.768	.168	.131	.250	5
M5 x	0.8	**TTS64287**	D7	.315	2.38	.933	.194	.152	.250	5
M6 x	1.0	**TTS64318**	D8	.394	2.50	1.000	.255	.191	.310	5
M8 x	1.25	**TTS64369**	D9	.512	2.72	1.126	.318	.238	.380	5
M10 x	1.5	**TTS64420**	D10	.591	2.94	1.252	.381	.286	.440	6
M12 x	1.75	**TTS6450A**	D11	.709	3.38	2.067	.367	.275	.440	6
M14 x	2.0	**TTS6454B**	D12	.787	3.59	2.067	.429	.322	.500	8
M16 x	2.0	**TTS6460B**	D12	.787	3.81	2.205	.480	.360	.560	8
M18 x	2.5	**TTS6465B**	D12	.984	4.03	2.205	.542	.406	.630	8
M20 x	2.5	**TTS6470B**	D12	.984	4.47	2.480	.652	.489	.690	8

◎ : 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	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	○			◎													

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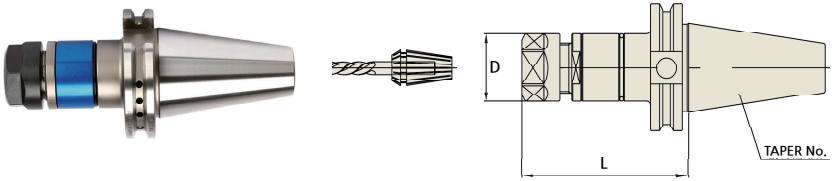
SYNCHRO TAPPING CHUCK (ER TYPE)

CAT SERIES



CAT AT3 AD/B

Unit : mm

EDP No.	TAPER No.	MODEL No.	Tap Size	Clamping Range	Nut	D	L
JK060SYT	40	CAT40AD/B-SYTER12-79	M3~M12	3.5~10	ER16	28	79
JK062SYT		CAT40AD/B-SYTER16-85	M3~M16	3.5~10	ER20	35	85
JK064SYT		CAT40AD/B-SYTER20-90	M3~M20	3.5~16	ER25	42	90
JK066SYT		CAT40AD/B-SYTER27-100	M4~M27	3.5~16	ER32	50	100
JK068SYT		CAT40AD/B-SYTER33-105	M4~M33	7~16	ER40	63	105
JL060SYT	50	CAT50AD/B-SYTER12-79	M3~M12	3.5~10	ER16	28	79
JL062SYT		CAT50AD/B-SYTER16-85	M3~M16	3.5~10	ER20	35	85
JL064SYT		CAT50AD/B-SYTER20-90	M3~M20	3.5~16	ER25	42	90
JL066SYT		CAT50AD/B-SYTER27-100	M4~M27	3.5~16	ER32	50	100
JL068SYT		CAT50AD/B-SYTER33-105	M4~M33	7~16	ER40	63	105

▶ Feature :
- To compensate for synchronization errors to extend tap life and to improve thread quality
- To compensate for pitch tolerances of taps
- For machine with synchronized spindle

▶ BT(JIS B6339/MAS-403), HSK(DIN 69893/ISO 12164-1) AND K-STRAIGHT TAPER PRODUCTS ARE AVAILABLE

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RECOMMENDED CUTTING CONDITIONS

Synchro TAP

			UNC/UNF M/MF		TTS65 TTS61	TTS66 TTS62	TKS67 TKS63	TTS68 TTS64
ISO	VDI 3323	Material Description	HB	HRc	Speed(SFM)			
P	1	Non-alloy steel	125		79-148	79-148	79-148	115-184
	2		190	13	79-148	79-148	79-148	115-184
	3		250	25	79-148	79-148	79-148	115-184
	4		270	28	66-128	66-128	66-128	98-164
	5		300	32				
	6	Low alloy steel	180	10	66-128	66-128	66-128	98-164
	7		275	29	66-128	66-128	66-128	98-164
	8		300	32				
	9		350	38				
	10	High alloyed steel, and tool steel	200	15				
	11		325	35				
M	12	Stainless steel	200	15	39-98	39-98		49-108
	13		240	23	39-98	39-98		49-108
	14		180	10	39-60	39-60		49-75
K	15	Grey cast iron	180	10	98-148	98-148	98-148	
	16		260	26			98-148	
	17	Nodular cast iron	160	3	82-148	82-148	82-148	
	18		250	25			82-148	
	19	Malleable cast iron	130				82-148	
	20		230	21			82-148	
N	21	Aluminum-wrought alloy	60					131-184
	22		100					131-184
	23	Aluminum-cast, alloyed	75		148-197	148-197	148-197	184-230
	24		90		148-197	148-197	148-197	184-230
	25		130		82-118	82-118	82-118	115-148
	26	Copper and Copper Alloys (Bronze / Brass)	110		98-148	98-148		
	27		90					
	28		100		82-118	82-118		115-148
	29	Non Metallic Materials						
	30							
S	31	Heat Resistant Super Alloys	200	15				
	32		280	30				
	33		250	25				
	34		350	38				
	35		320	34				
	36	Titanium Alloys	400 Rm					
	37		1050 Rm					
H	38	Hardened steel	550	55				
	39		630	60				
	40	Chilled Cast Iron	400	42				
	41	Hardened Cast Iron	550	55				

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TROUBLE SHOOTING GUIDE

Specific Problem	Cause	Solution
		Dimensional Accuracy
Oversize Pitch Diameter	Incorrect Tap	1. Use proper limits of taps 2. Use longer chamfered taps
	Chip Packing	1. Use spiral point or spiral fluted taps 2. Reduce number of flutes to provide extra chip room 3. Use larger hole size 4. If tapping a hole, allow deeper hole where applicable or shorten the thread length of the parts 5. Use proper lubricant
	Galling	1. Apply coated tap: HardSlick or Chrome 2. Use proper coolant/conccentration 3. Reduce tapping speed 4. Use proper cutting angle in accordance with material being tapped 5. Use large hole size
	Operating Conditions	1. Check tapping speed 2. Be sure of correct to tool alignment 3. Free cutting either tap or workpiece 4. Use proper tapping speed to avoid torn or rough threads 5. Use lead screw tapper 6. Use proper tapping machine with suitable power 7. Avoid misalignment of the tap and drill hole from loose spindle or worn holder
	Tool Condition	1. Obtain proper indexing angle for the flutes at the cutting edge 2. Grind proper cutting angle and chamfer angle 3. Avoid too narrow a land width 4. Remove burrs from regrinding
Oversize Internal Diameter	Hole Size	1. Use minimum hole size 2. Avoid tapered hole 3. Use proper chamfered taps
	Galling	1. Galling solutions 1 through 4 above can be applied to this specific problem
Undersize Pitch Diameter	Incorrect Tap	1. Use oversize taps 2. Apply proper chamfer angle 3. Increase cutting angle
	Damaged Thread	1. Use proper reversing speed to avoid damaging tapped thread on the way out of the hole
	Left-over Chips	1. Increase cutting performance to avoid any left over chips in the hole 2. Remove left over chips from the hole for gage checking
Undersize Internal Diameter	Hole Size	1. Use maximum drill size
Breakage	Incorrect Tap Selection	1. Avoid chip packing in the flutes or on the bottom of the hole Use spiral pointed or spiral fluted taps or fluteless taps 2. Apply correct surface treatment such as Hardslick or bright
	Excessive Tapping Torque	1. Use larger drill size 2. Try to shorten thread length 3. Increase cutting angle 4. Apply a tap with more thread relief and reduced land width 5. Apply correct surface treatment such as Hardslick

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TROUBLE SHOOTING GUIDE

Specific Problem	Cause	Solution
		Dimensional Accuracy
Breakage	Operating Conditions	1. Reduce tapping speed 2. Avoid misalignment between tap and the hole and tapered hole 3. Use floating type of tapping holder 4. Use tapping holder with torque adjustment 5. Avoid hitting bottom of the hole with tap
	Tool Condition	1. Do not grind the bottom of the flute 2. Avoid too narrow a land width 3. Remove all worn sections when regrinding the flutes 4. Regrind tool more frequently
Chipping	Incorrect Tap Selection	1. Reduce cutting angle 2. Use a different kind of high-speed steel tap 3. Reduce hardness of the tap 4. Increase chamfer length 5. Avoid chip packing in the flutes or in the bottom of the hole by using spiral fluted or spiral pointed taps
	Operating Conditions	1. Reduce tapping speed 2. Avoid misalignment between tap and hole 3. Avoid sudden return of reverse in blind hole tapping 4. Avoid galling 5. Use larger hole size
Wear	Incorrect Tap Selection	1. Apply specially designed tap for tapping heat treated material 2. Change to a type of high-speed steel tap that contains vanadium 3. Apply special surface treatment such as TiCN, TiAlN or Hardslick 4. Increase chamfer length
	Operating Conditions	1. Reduce tapping speed 2. Apply proper cutting lubricants 3. Avoid work hardened hole 4. Use larger hole size
	Tool Condition	1. Grind proper cutting angle 2. Avoid hardness reduction from grinding process
Torn or Rough Thread	Chamfer Too Short	1. Increase chamfer length
	Wrong Cutting Angle	1. Apply proper cutting angle
	Galling	1. Use thread relieved taps 2. Reduce land width 3. Apply surface treatment such as Hardslick or chrome 4. Use proper cutting lubricant 5. Reduce tapping speed 6. Use larger hole size 7. Obtain proper alignment between tap and work
	Chip Packing	1. Use spiral pointed or spiral fluted taps 2. Use larger drill size
Chattering on Tapped Thread	Tool Free Cutting	1. Reduce cutting angle 2. Reduce amount of thread relief
	Tool Condition	1. Avoid too narrow land width 2. Do not grind the bottom of the flute

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UNC/UNF RECOMMENDED TAP DRILL SIZE
- UNIFIED THREAD

Size	Threads Per Inch				Minor Diameter			Tap Drill Diameter (Cutting Tap)				
	UNC	UNF	UNEF	UN	Min. 2B&3B	Max. 2B	Max. 3B	80% Thread	75% Thread	70% Thread	65% Thread	60% Thread
#0	-	80	-	-	.0465	.0514	.0514	.0470	.0478	.0486	.0494	.0503
#1	64	-	-	-	.0561	.0623	.0623	.0568	.0578	.0588	.0598	.0608
	-	72	-	-	.0580	.0635	.0635	.0586	.0595	.0604	.0613	.0622
#2	56	-	-	-	.0667	.0737	.0737	.0674	.0686	.0698	.0709	.0721
	-	64	-	-	.0691	.0753	.0753	.0698	.0708	.0718	.0728	.0738
#3	48	-	-	-	.0764	.0845	.0845	.0774	.0787	.0801	.0814	.0828
	-	56	-	-	.0797	.0865	.0865	.0804	.0816	.0828	.0839	.0851
#4	40	-	-	-	.0849	.0939	.0939	.0860	.0876	.0893	.0909	.0925
	-	48	-	-	.0894	.0968	.0968	.0904	.0917	.0931	.0944	.0958
#5	40	-	-	-	.0979	.1062	.1062	.0990	.1006	.1023	.1039	.1055
	-	44	-	-	.1004	.1079	.1079	.1014	.1029	.1043	.1058	.1073
#6	32	-	-	-	.1040	.1140	.1140	.1055	.1076	.1096	.1116	.1136
	-	40	-	-	.1110	.1190	.1186	.1120	.1136	.1153	.1169	.1185
#8	32	-	-	-	.1300	.1390	.1389	.1315	.1336	.1356	.1376	.1396
	-	36	-	-	.1340	.1420	.1416	.1351	.1369	.1387	.1405	.1424
#10	24	-	-	-	.1450	.1560	.1555	.1467	.1494	.1521	.1548	.1575
	-	32	-	-	.1560	.1640	.1641	.1575	.1596	.1616	.1636	.1656
#12	24	-	-	-	.1710	.1810	.1807	.1727	.1754	.1781	.1808	.1835
	-	28	-	-	.1770	.1860	.1857	.1789	.1812	.1835	.1858	.1882
	-	-	32	-	.1820	.1900	.1895	.1835	.1856	.1876	.1896	.1916
1/4	20	-	-	-	.1960	.2070	.2067	.1980	.2013	.2045	.2078	.2110
	-	28	-	-	.2110	.2200	.2190	.2129	.2152	.2175	.2198	.2222
	-	-	32	-	.2160	.2240	.2229	.2175	.2196	.2216	.2236	.2256
5/16	18	-	-	-	.2520	.2650	.2630	.2548	.2584	.2620	.2656	.2692
	-	-	-	20	.2580	.2700	.2680	.2605	.2638	.2670	.2703	.2735
	-	24	-	-	.2670	.2770	.2754	.2692	.2719	.2746	.2773	.2800
	-	-	-	28	.2740	.2820	.2807	.2754	.2777	.2800	.2823	.2847
	-	-	32	-	.2790	.2860	.2847	.2800	.2821	.2841	.2861	.2881
3/8	16	-	-	-	.3070	.3210	.3182	.3101	.3141	.3182	.3222	.3263
	-	-	-	20	.3210	.3320	.3297	.3230	.3263	.3295	.3328	.3360
	-	24	-	-	.3300	.3400	.3372	.3317	.3344	.3371	.3398	.3425
	-	-	-	28	.3360	.3450	.3426	.3379	.3402	.3425	.3448	.3472
	-	-	32	-	.3410	.3490	.3469	.3425	.3446	.3466	.3486	.3506
7/16	14	-	-	-	.3600	.3760	.3717	.3633	.3679	.3726	.3772	.3818
	-	-	-	16	.3700	.3840	.3800	.3726	.3766	.3807	.3847	.3888
	-	20	-	-	.3830	.3950	.3916	.3855	.3888	.3920	.3953	.3985
	-	-	28	-	.3990	.4070	.4051	.4004	.4027	.4050	.4073	.4097
	-	-	-	32	.4040	.4110	.4094	.4050	.4071	.4091	.4111	.4131
1/2	13	-	-	-	.4170	.4340	.4284	.4201	.4251	.4301	.4351	.4400
	-	-	-	16	.4320	.4460	.4419	.4351	.4391	.4432	.4472	.4513
	-	20	-	-	.4460	.4570	.4537	.4480	.4513	.4545	.4578	.4610
	-	-	28	-	.4610	.4700	.4676	.4629	.4652	.4675	.4698	.4722
	-	-	-	32	.4660	.4740	.4719	.4675	.4696	.4716	.4736	.4756
9/16	12	-	-	-	.4720	.4900	.4843	.4759	.4813	.4867	.4921	.4976

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UNC/UNF RECOMMENDED TAP DRILL SIZE
- UNIFIED THREAD

Size	Threads Per Inch				Minor Diameter			Tap Drill Diameter (Cutting Tap)				
	UNC	UNF	UNEF	UN	Min. 2B&3B	Max. 2B	Max. 3B	80% Thread	75% Thread	70% Thread	65% Thread	60% Thread
	-	-	-	16	.4950	.5090	.5040	.4976	.5016	.5057	.5097	.5138
	-	18	-	-	.5020	.5150	.5106	.5048	.5084	.5120	.5156	.5192
	-	-	-	20	.5080	.5200	.5162	.5105	.5138	.5170	.5203	.5235
	-	-	24	-	.5170	.5270	.5244	.5192	.5219	.5246	.5273	.5300
	-	-	-	28	.5240	.5320	.5301	.5254	.5277	.5300	.5323	.5347
	-	-	-	32	.5290	.5360	.5344	.5300	.5321	.5341	.5361	.5381
5/8	11	-	-	-	.5270	.5460	.5391	.5305	.5364	.5423	.5482	.5541
	-	-	-	12	.5350	.5530	.5463	.5384	.5438	.5492	.5546	.5601
	-	-	-	16	.5570	.5710	.5562	.5601	.5641	.5682	.5722	.5763
	-	18	-	-	.5650	.5780	.5730	.5673	.5709	.5745	.5781	.5817
	-	-	-	20	.5710	.5820	.5787	.5730	.5763	.5795	.5828	.5860
	-	-	24	-	.5800	.5900	.5869	.5817	.5844	.5871	.5898	.5925
	-	-	-	28	.5860	.5950	.5926	.5879	.5902	.5925	.5948	.5972
	-	-	-	32	.5910	.5980	.5969	.5925	.5946	.5966	.5986	.6006
11/16	-	-	-	12	.5970	.6150	.6085	.6009	.6063	.6117	.6171	.6226
	-	-	-	16	.6200	.6340	.6284	.6226	.6266	.6307	.6347	.6388
	-	-	-	20	.6330	.6450	.6412	.6355	.6388	.6420	.6453	.6485
	-	-	24	-	.6420	.6520	.6494	.6442	.6469	.6496	.6523	.6550
	-	-	-	28	.6490	.6570	.6551	.6504	.6527	.6550	.6573	.6597
	-	-	-	32	.6540	.6610	.6594	.6550	.6571	.6591	.6611	.6631
3/4	10	-	-	-	.6420	.6630	.6545	.6461	.6526	.6591	.6656	.6721
	-	-	-	12	.6600	.6780	.6707	.6634	.6688	.6742	.6796	.6851
	-	16	-	-	.6820	.6960	.6908	.6851	.6891	.6932	.6972	.7013
	-	-	20	-	.6960	.7070	.7037	.6980	.7013	.7045	.7078	.7110
	-	-	-	28	.7110	.7200	.7176	.7129	.7152	.7175	.7198	.7222
	-	-	-	32	.7160	.7240	.7219	.7175	.7196	.7216	.7236	.7256
13/16	-	-	-	12	.7220	.7400	.7329	.7259	.7313	.7367	.7421	.7476
	-	-	-	16	.7450	.7590	.7533	.7476	.7516	.7557	.7597	.7638
	-	-	20	-	.7580	.7700	.7662	.7605	.7638	.7670	.7703	.7735
	-	-	-	28	.7740	.7820	.7801	.7754	.7777	.7800	.7823	.7847
	-	-	-	32	.7790	.7860	.7844	.7800	.7821	.7841	.7861	.7881
7/8	9	-	-	-	.7550	.7780	.7681	.7595	.7668	.7740	.7812	.7884
	-	-	-	12	.7850	.8030	.7948	.7884	.7938	.7992	.8046	.8101
	-	14	-	-	.7980	.8140	.8068	.8008	.8054	.8101	.8147	.8193
	-	-	-	16	.8070	.8210	.8158	.8101	.8141	.8182	.8222	.8263
	-	-	20	-	.8210	.8320	.8287	.8230	.8263	.8295	.8328	.8360
	-	-	-	28	.8360	.8450	.8426	.8379	.8402	.8425	.8448	.8472
	-	-	-	32	.8410	.8490	.8469	.8425	.8446	.8466	.8486	.8506
15/16	-	-	-	12	.8470	.8650	.8575	.8509	.8563	.8617	.8671	.8726
	-	-	-	16	.8700	.8840	.8783	.8726	.8766	.8807	.8847	.8888
	-	-	20	-	.8830	.8950	.8912	.8855	.8888	.8920	.8953	.8985
	-	-	-	28	.8990	.9070	.9051	.9004	.9027	.9050	.9073	.9097
	-	-	-	32	.9040	.9110	.9094	.9050	.9071	.9091	.9111	.9131
1"	8	-	-	-	.8650	.8900	.8797	.8701	.8782	.8863	.8945	.9026

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UNC/UNF RECOMMENDED TAP DRILL SIZE
- UNIFIED THREAD

Size	Threads Per Inch				Minor Diameter			Tap Drill Diameter (Cutting Tap)				
	UNC	UNF	UNEF	UN	Min. 2B&3B	Max. 2B	Max. 3B	80% Thread	75% Thread	70% Thread	65% Thread	60% Thread
	-	12	-	-	.9100	.9280	.9198	.9134	.9188	.9242	.9296	.9351
	-	-	-	16	.9320	.9460	.9408	.9351	.9391	.9432	.9472	.9513
	-	-	20	-	.9460	.9570	.9537	.9480	.9513	.9545	.9578	.9610
	-	-	-	28	.9610	.9700	.9676	.9629	.9652	.9675	.9698	.9722
	-	-	-	32	.9660	.9740	.9719	.9675	.9696	.9716	.9736	.9756
1*1/16	-	-	-	8	.9270	.9520	.9422	.9326	.9407	.9488	.9570	.9651
	-	-	-	12	.9720	.9900	.9823	.9759	.9813	.9867	.9921	.9976
	-	-	-	16	.9950	1.0090	1.0033	.9976	1.0016	1.0057	1.0097	1.0138
	-	-	18	-	1.0020	1.0150	1.0105	1.0048	1.0084	1.0120	1.0156	1.0192
	-	-	-	20	1.0080	1.0200	1.0162	1.0105	1.0138	1.0170	1.0203	1.0235
	-	-	-	28	1.0240	1.0320	1.0301	1.0254	1.0277	1.0300	1.0323	1.0347
1*1/8	7	-	-	-	.9700	.9980	.9875	.9765	.9858	.9951	1.0044	1.0137
	-	-	-	8	.9900	1.0150	1.0047	.9951	1.0032	1.0113	1.0195	1.0276
	-	12	-	-	1.0350	1.0530	1.0448	1.0384	1.0438	1.0492	1.0546	1.0601
	-	-	-	16	1.0570	1.0710	1.0658	1.0601	1.0641	1.0682	1.0722	1.0763
	-	-	18	-	1.0650	1.0780	1.0730	1.0673	1.0709	1.0745	1.0781	1.0817
	-	-	-	20	1.0710	1.0820	1.0787	1.0730	1.0763	1.0795	1.0828	1.0860
	-	-	-	28	1.0860	1.0950	1.0926	1.0879	1.0902	1.0925	1.0948	1.0972
1*3/16	-	-	-	8	1.0520	1.0770	1.0672	1.0576	1.0657	1.0738	1.0820	1.0901
	-	-	-	12	1.0970	1.1150	1.1073	1.1009	1.1063	1.1117	1.1171	1.1226
	-	-	-	16	1.1200	1.1340	1.1283	1.1226	1.1266	1.1307	1.1347	1.1388
	-	-	18	-	1.1270	1.1400	1.1355	1.1298	1.1334	1.1370	1.1406	1.1442
	-	-	-	20	1.1330	1.1450	1.1412	1.1355	1.1388	1.1420	1.1453	1.1485
	-	-	-	28	1.1490	1.1570	1.1551	1.1504	1.1527	1.1550	1.1573	1.1597
1*1/4	7	-	-	-	1.0950	1.1230	1.1125	1.1015	1.1108	1.1201	1.1294	1.1387
	-	-	-	8	1.1150	1.1400	1.1297	1.1201	1.1282	1.1363	1.1445	1.1526
	-	12	-	-	1.1600	1.1780	1.1698	1.1634	1.1688	1.1742	1.1796	1.1851
	-	-	-	16	1.1820	1.1960	1.1908	1.1851	1.1891	1.1932	1.1972	1.2013
	-	-	18	-	1.1900	1.2030	1.1980	1.1923	1.1959	1.1995	1.2031	1.2067
	-	-	-	20	1.1960	1.2070	1.2037	1.1980	1.2013	1.2045	1.2078	1.2110
	-	-	-	28	1.2110	1.2200	1.2176	1.2129	1.2152	1.2175	1.2198	1.2222
1*5/16	-	-	-	8	1.1770	1.2020	1.1922	1.1826	1.1907	1.1988	1.2070	1.2151
	-	-	-	12	1.2220	1.2400	1.2323	1.2259	1.2313	1.2367	1.2421	1.2476
	-	-	-	16	1.2450	1.2590	1.2533	1.2476	1.2516	1.2557	1.2597	1.2638
	-	-	18	-	1.2520	1.2650	1.2605	1.2548	1.2584	1.2620	1.2656	1.2692
	-	-	-	20	1.2580	1.2700	1.2662	1.2605	1.2638	1.2670	1.2703	1.2735
	-	-	-	28	1.2740	1.2820	1.2801	1.2754	1.2777	1.2800	1.2823	1.2847
1*3/8	6	-	-	-	1.1950	1.2250	1.2146	1.2018	1.2126	1.2235	1.2343	1.2451
	-	-	-	8	1.2400	1.2650	1.2547	1.2451	1.2532	1.2613	1.2695	1.2776
	-	12	-	-	1.2580	1.3030	1.2948	1.2884	1.2938	1.2992	1.3046	1.3101
	-	-	-	16	1.3070	1.3210	1.3158	1.3101	1.3141	1.3182	1.3222	1.3263
	-	-	18	-	1.3150	1.3280	1.3230	1.3173	1.3209	1.3245	1.3281	1.3317
	-	-	-	20	1.3210	1.3320	1.3287	1.3230	1.3263	1.3295	1.3328	1.3360
	-	-	-	28	1.3360	1.3450	1.3426	1.3379	1.3402	1.3425	1.3448	1.3472

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UNC/UNF RECOMMENDED TAP DRILL SIZE
- UNIFIED THREAD

Size	Threads Per Inch				Minor Diameter			Tap Drill Diameter (Cutting Tap)				
	UNC	UNF	UNEF	UN	Min. 2B&3B	Max. 2B	Max. 3B	80% Thread	75% Thread	70% Thread	65% Thread	60% Thread
1*7/16	-	-	-	6	1.2570	1.2880	1.2771	1.2643	1.2751	1.2860	1.2968	1.3076
	-	-	-	8	1.3020	1.3270	1.3172	1.3076	1.3157	1.3238	1.3320	1.3401
	-	-	-	12	1.3470	1.3650	1.3573	1.3509	1.3563	1.3617	1.3671	1.3726
	-	-	-	16	1.3700	1.3840	1.3783	1.3726	1.3766	1.3807	1.3847	1.3888
	-	-	18	-	1.3770	1.3900	1.3855	1.3798	1.3834	1.3870	1.3906	1.3942
	-	-	-	20	1.3830	1.3950	1.3912	1.3855	1.3888	1.3920	1.3953	1.3985
	-	-	-	28	1.3990	1.4070	1.4051	1.4004	1.4027	1.4050	1.4073	1.4097
1*1/2	6	-	-	-	1.3200	1.3500	1.3396	1.3268	1.3376	1.3485	1.3593	1.3701
	-	-	-	8	1.3650	1.3900	1.3797	1.3701	1.3782	1.3863	1.3945	1.4026
	-	12	-	-	1.4100	1.4280	1.4198	1.4134	1.4188	1.4242	1.4296	1.4351
	-	-	-	16	1.4320	1.4460	1.4408	1.4351	1.4391	1.4432	1.4472	1.4513
	-	-	18	-	1.4400	1.4520	1.4480	1.4423	1.4459	1.4495	1.4531	1.4567
	-	-	-	20	1.4460	1.4570	1.4537	1.4480	1.4513	1.4545	1.4578	1.4610
	-	-	-	28	1.4610	1.4700	1.4676	1.4629	1.4652	1.4675	1.4698	1.4722
1*9/16	-	-	-	6	1.3820	1.4130	1.4021	1.3893	1.4001	1.4110	1.4218	1.4326
	-	-	-	8	1.4270	1.4520	1.4422	1.4326	1.4407	1.4488	1.4570	1.4651
	-	-	-	12	1.4720	1.4900	1.4823	1.4759	1.4813	1.4867	1.4921	1.4976
	-	-	-	16	1.4950	1.5090	1.5033	1.4976	1.5016	1.5057	1.5097	1.5138
	-	-	18	-	1.5020	1.5150	1.5105	1.5048	1.5084	1.5120	1.5156	1.5192
	-	-	-	20	1.5080	1.5200	1.5162	1.5105	1.5138	1.5170	1.5203	1.5235
1*5/8	-	-	-	6	1.4450	1.4750	1.4646	1.4518	1.4626	1.4735	1.4843	1.4951
	-	-	-	8	1.4900	1.5150	1.5047	1.4951	1.5032	1.5113	1.5195	1.5276
	-	-	-	12	1.5350	1.5530	1.5448	1.5384	1.5438	1.5492	1.5546	1.5601
	-	-	-	16	1.5570	1.5710	1.5658	1.5601	1.5641	1.5682	1.5722	1.5763
	-	-	18	-	1.5650	1.5780	1.5730	1.5673	1.5709	1.5745	1.5781	1.5817
	-	-	-	20	1.5710	1.5820	1.5787	1.5730	1.5763	1.5795	1.5828	1.5860
1*11/16	-	-	-	6	1.5070	1.5380	1.5271	1.5143	1.5251	1.5360	1.5468	1.5576
	-	-	-	8	1.5520	1.5770	1.5672	1.5576	1.5657	1.5738	1.5820	1.5901
	-	-	-	12	1.5970	1.6150	1.6073	1.6009	1.6063	1.6117	1.6171	1.6226
	-	-	-	16	1.6200	1.6340	1.6283	1.6226	1.6266	1.6307	1.6347	1.6388
	-	-	18	-	1.6270	1.6400	1.6355	1.6298	1.6334	1.6370	1.6406	1.6442
	-	-	-	20	1.6330	1.6450	1.6412	1.6355	1.6388	1.6420	1.6453	1.6485
1*3/4	5	-	-	-	1.5340	1.5680	1.5575	1.5422	1.5552	1.5681	1.5811	1.5941
	-	-	-	6	1.5700	1.6000	1.5896	1.5768	1.5876	1.5985	1.6093	1.6201
	-	-	-	8	1.6150	1.6400	1.6297	1.6201	1.6282	1.6363	1.6445	1.6526
	-	-	-	12	1.6600	1.6780	1.6698	1.6634	1.6688	1.6742	1.6796	1.6851
	-	-	-	16	1.6820	1.6960	1.6908	1.6851	1.6891	1.6932	1.6972	1.7013
	-	-	-	20	1.6960	1.7070	1.7037	1.6980	1.7013	1.7045	1.7078	1.7110
1*13/16	-	-	-	6	1.6320	1.6630	1.6521	1.6393	1.6501	1.6610	1.6718	1.6826
	-	-	-	8	1.6770	1.7020	1.6922	1.6826	1.6907	1.6988	1.7070	1.7151
	-	-	-	12	1.7220	1.7400	1.7323	1.7259	1.7313	1.7367	1.7421	1.7476
	-	-	-	16	1.7450	1.7590	1.7533	1.7476	1.7516	1.7557	1.7597	1.7638
	-	-	-	20	1.7580	1.7700	1.7662	1.7605	1.7638	1.7670	1.7703	1.7735
1*7/8	-	-	-	6	1.6950	1.7250	1.7146	1.7018	1.7126	1.7235	1.7343	1.7451

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UNC/UNF RECOMMENDED TAP DRILL SIZE
- UNIFIED THREAD

Size	Threads Per Inch				Minor Diameter			Tap Drill Diameter (Cutting Tap)				
	UNC	UNF	UNEF	UN	Min. 2B&3B	Max. 2B	Max. 3B	80% Thread	75% Thread	70% Thread	65% Thread	60% Thread
	-	-	-	8	1.7400	1.7650	1.7547	1.7451	1.7532	1.7613	1.7695	1.7776
	-	-	-	12	1.7850	1.8030	1.7948	1.7884	1.7938	1.7992	1.8046	1.8101
	-	-	-	16	1.8070	1.8210	1.8158	1.8101	1.8141	1.8182	1.8222	1.8263
	-	-	-	20	1.8210	1.8320	1.8287	1.8230	1.8263	1.8295	1.8328	1.8360
1*15/16	-	-	-	6	1.7570	1.7880	1.7771	1.7643	1.7751	1.7860	1.7968	1.8076
	-	-	-	8	1.8020	1.8270	1.8172	1.8076	1.8157	1.8238	1.8320	1.8401
	-	-	-	12	1.8470	1.8650	1.8573	1.8509	1.8563	1.8617	1.8671	1.8726
	-	-	-	16	1.8700	1.8840	1.8783	1.8726	1.8766	1.8807	1.8847	1.8888
	-	-	-	20	1.8830	1.8950	1.8912	1.8855	1.8888	1.8920	1.8953	1.8985
2"	4 1/2	-	-	-	1.7590	1.7950	1.7861	1.7691	1.7835	1.7979	1.8124	1.8268
	-	-	-	6	1.8200	1.8500	1.8396	1.8268	1.8376	1.8485	1.8593	1.8701
	-	-	-	8	1.8650	1.8900	1.8797	1.8701	1.8782	1.8863	1.8945	1.9026
	-	-	-	12	1.9100	1.9280	1.9198	1.9134	1.9188	1.9242	1.9296	1.9351
	-	-	-	16	1.9320	1.9460	1.9408	1.9351	1.9391	1.9432	1.9472	1.9513
	-	-	-	20	1.9460	1.9570	1.9537	1.9480	1.9513	1.9545	1.9578	1.9610
2*1/8	-	-	-	6	1.9450	1.9750	1.9646	1.9518	1.9626	1.9735	1.9843	1.9951
	-	-	-	8	1.9900	2.0150	2.0047	1.9951	2.0032	2.0113	2.0195	2.0276
	-	-	-	12	2.0350	2.0530	2.0448	2.0384	2.0438	2.0492	2.0546	2.0601
	-	-	-	16	2.0570	2.0710	2.0658	2.0601	2.0641	2.0682	2.0722	2.0763
	-	-	-	20	2.0710	2.0820	2.0787	2.0730	2.0763	2.0795	2.0828	2.0860
2*1/4	4 1/2	-	-	-	2.0090	2.0450	2.0361	2.0191	2.0335	2.0479	2.0624	2.0768
	-	-	-	6	2.0700	2.1000	2.0896	2.0768	2.0876	2.0985	2.1093	2.1201
	-	-	-	8	2.1150	2.1400	2.1297	2.1201	2.1282	2.1363	2.1445	2.1526
	-	-	-	12	2.1600	2.1780	2.1698	2.1634	2.1688	2.1742	2.1796	2.1851
	-	-	-	16	2.1820	2.1960	2.1908	2.1851	2.1891	2.1932	2.1972	2.2013
	-	-	-	20	2.1960	2.2070	2.2037	2.1980	2.2013	2.2045	2.2078	2.2110
2*3/8	-	-	-	6	2.1950	2.2260	2.2146	2.2018	2.2126	2.2235	2.2343	2.2451
	-	-	-	8	2.2400	2.2650	2.2547	2.2451	2.2532	2.2613	2.2695	2.2776
	-	-	-	12	2.2850	2.3030	2.2948	2.2884	2.2938	2.2992	2.3046	2.3101
	-	-	-	16	2.3070	2.3210	2.3158	2.3101	2.3141	2.3182	2.3222	2.3263
	-	-	-	20	2.3210	2.3320	2.3287	2.3230	2.3263	2.3295	2.3328	2.3360
2*1/2	4	-	-	-	2.2290	2.2670	2.2594	2.2402	2.2564	2.2727	2.2889	2.3052
	-	-	-	6	2.3200	2.3500	2.3396	2.3268	2.3376	2.3485	2.3593	2.3701
	-	-	-	8	2.3650	2.3900	2.3797	2.3701	2.3782	2.3863	2.3945	2.4026
	-	-	-	12	2.4100	2.4280	2.4198	2.4134	2.4188	2.4242	2.4296	2.4351
	-	-	-	16	2.4320	2.4460	2.4408	2.4351	2.4391	2.4432	2.4472	2.4513
	-	-	-	20	2.4460	2.4570	2.4537	2.4480	2.4513	2.4545	2.4578	2.4610

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M/MF RECOMMENDED TAP DRILL SIZE
- METRIC THREAD

Size	Pitch		Minor Diameter		Tap Drill Diameter(Cutting Tap)									
	M	MF	Min. 6H	Max. 6H	80% Thread		75% Thread		70% Thread		65% Thread		60% Thread	
					mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
M1	0.25	-	0.729	0.798	0.74	.0291	0.76	.0298	0.77	.0304	0.79	.0311	0.81	.0317
	-	0.2	0.783	0.841	0.79	.0312	0.81	.0317	0.82	.0322	0.83	.0327	0.84	.0332
M1.1	0.25	-	0.829	0.898	0.84	.0331	0.86	.0337	0.87	.0344	0.89	.0350	0.91	.0356
	-	0.2	0.883	0.941	0.89	.0351	0.91	.0356	0.92	.0361	0.93	.0367	0.94	.0372
M1.2	0.25	-	0.929	0.998	0.94	.0370	0.96	.0377	0.97	.0383	0.99	.0389	1.01	.0396
	-	0.2	0.983	1.041	0.99	.0391	1.01	.0396	1.02	.0401	1.03	.0406	1.04	.0411
M1.4	0.3	-	1.075	1.159	1.09	.0428	1.11	.0436	1.13	.0444	1.15	.0451	1.17	.0459
	-	0.2	1.183	1.241	1.19	.0469	1.21	.0474	1.22	.0480	1.23	.0485	1.24	.0490
M1.6	0.35	-	1.221	1.321	1.24	.0487	1.26	.0496	1.28	.0505	1.30	.0514	1.33	.0523
	-	0.2	1.383	1.441	1.39	.0548	1.41	.0553	1.42	.0558	1.43	.0563	1.44	.0569
M1.7	0.35	-	1.321	1.421	1.34	.0526	1.36	.0535	1.38	.0544	1.40	.0553	1.43	.0562
	-	0.3	1.375	1.459	1.39	.0547	1.41	.0554	1.43	.0562	1.45	.0570	1.47	.0577
	-	0.25	1.429	1.498	1.44	.0567	1.46	.0573	1.47	.0580	1.49	.0586	1.51	.0593
	-	0.2	1.483	1.541	1.49	.0587	1.51	.0593	1.52	.0598	1.53	.0603	1.54	.0608
M1.8	0.35	-	1.421	1.521	1.44	.0565	1.46	.0574	1.48	.0583	1.50	.0592	1.53	.0601
	-	0.2	1.583	1.641	1.59	.0627	1.61	.0632	1.62	.0637	1.63	.0642	1.64	.0647
M2	0.4	-	1.567	1.679	1.58	.0624	1.61	.0634	1.64	.0644	1.66	.0654	1.69	.0665
	-	0.25	1.729	1.798	1.74	.0685	1.76	.0692	1.77	.0698	1.79	.0704	1.81	.0711
M2.2	0.45	-	1.713	1.838	1.73	.0682	1.76	.0694	1.79	.0705	1.82	.0717	1.85	.0728
	-	0.25	1.929	1.998	1.94	.0764	1.96	.0770	1.97	.0777	1.99	.0783	2.01	.0789
M2.3	0.4	-	1.867	1.979	1.88	.0742	1.91	.0752	1.94	.0762	1.96	.0773	1.99	.0783
	-	0.35	1.921	2.021	1.94	.0762	1.96	.0771	1.98	.0780	2.00	.0789	2.03	.0798
	-	0.25	2.029	2.098	2.04	.0803	2.06	.0810	2.07	.0816	2.09	.0822	2.11	.0829
M2.5	0.45	-	2.013	2.138	2.03	.0800	2.06	.0812	2.09	.0823	2.12	.0835	2.15	.0846
	-	0.35	2.121	2.221	2.14	.0841	2.16	.0850	2.18	.0859	2.20	.0868	2.23	.0877
M2.6	0.45	-	2.113	2.238	2.13	.0840	2.16	.0851	2.19	.0863	2.22	.0874	2.25	.0886
	-	0.35	2.221	2.321	2.24	.0880	2.26	.0889	2.28	.0898	2.30	.0907	2.33	.0916
M3	0.5	-	2.459	2.599	2.48	.0997	2.51	.0989	2.55	.1002	2.58	.1015	2.61	.1028
	-	0.35	2.621	2.721	2.64	.1038	2.66	.1047	2.68	.1056	2.70	.1065	2.73	.1074
M3.5	0.6	-	2.850	3.010	2.88	.1132	2.92	.1148	2.95	.1163	2.99	.1178	3.03	.1194
	-	0.35	3.121	3.221	3.14	.1235	3.16	.1244	3.18	.1253	3.20	.1262	3.23	.1271
M4	0.7	-	3.242	3.422	3.27	.1288	3.32	.1306	3.36	.1324	3.41	.1342	3.45	.1360
	-	0.5	3.459	3.599	3.48	.1370	3.51	.1383	3.55	.1396	3.58	.1409	3.61	.1421
M4.5	0.75	-	3.688	3.878	3.72	.1465	3.77	.1484	3.82	.1503	3.87	.1522	3.92	.1542
	-	0.5	3.959	4.099	3.98	.1567	4.01	.1580	4.05	.1593	4.08	.1605	4.11	.1618
M5	0.9	-	4.026	4.226	4.06	.1600	4.12	.1623	4.18	.1646	4.24	.1669	4.30	.1692
	0.8	-	4.134	4.334	4.17	.1641	4.22	.1662	4.27	.1682	4.32	.1703	4.38	.1723
	-	0.5	4.459	4.599	4.48	.1764	4.51	.1777	4.55	.1790	4.58	.1802	4.61	.1815
M5.5	-	0.9	4.526	4.726	4.56	.1797	4.62	.1820	4.68	.1843	4.74	.1866	4.80	.1889
	-	0.75	4.688	4.878	4.72	.1858	4.77	.1878	4.82	.1897	4.87	.1916	4.92	.1935
	-	0.5	4.959	5.099	4.98	.1961	5.01	.1974	5.05	.1986	5.08	.1999	5.11	.2012
M6	1	-	4.917	5.153	4.96	.1953	5.03	.1979	5.09	.2004	5.16	.2030	5.22	.2055
	-	0.75	5.188	5.378	5.22	.2055	5.27	.2075	5.32	.2094	5.37	.2113	5.42	.2132
	-	0.5	5.459	5.599	5.48	.2158	5.51	.2170	5.55	.2183	5.58	.2196	5.61	.2209
M7	1	-	5.917	6.153	5.96	.2347	6.03	.2372	6.09	.2398	6.16	.2423	6.22	.2449
	-	0.75	6.188	6.378	6.22	.2449	6.27	.2468	6.32	.2487	6.37	.2507	6.42	.2526
	-	0.5	6.459	6.599	6.48	.2551	6.51	.2564	6.55	.2577	6.58	.2590	6.61	.2602
M8	1.25	-	6.647	6.912	6.70	.2638	6.78	.2670	6.86	.2702	6.94	.2734	7.03	.2766
	-	1	6.917	7.153	6.96	.2740	7.03	.2766	7.09	.2792	7.16	.2817	7.22	.2843
	-	0.75	7.188	7.378	7.22	.2843	7.27	.2862	7.32	.2881	7.37	.2900	7.42	.2919

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M/MF RECOMMENDED TAP DRILL SIZE
- METRIC THREAD

Size	Pitch		Minor Diameter		Tap Drill Diameter(Cutting Tap)									
	M	MF	Min. 6H	Max. 6H	80% Thread		75% Thread		70% Thread		65% Thread		60% Thread	
					mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
	-	0.5	7.459	7.599	7.48	.2945	7.51	.2958	7.55	.2971	7.58	.2983	7.61	.2996
M9	1.25	-	7.647	7.912	7.70	.3032	7.78	.3064	7.86	.3096	7.94	.3128	8.03	.3160
	-	1	7.917	8.153	7.96	.3134	8.03	.3160	8.09	.3185	8.16	.3211	8.22	.3236
	-	0.75	8.188	8.378	8.22	.3236	8.27	.3256	8.32	.3275	8.37	.3294	8.42	.3313
	-	0.5	8.459	8.599	8.48	.3339	8.51	.3352	8.55	.3364	8.58	.3377	8.61	.3390
M10	1.5	-	8.376	8.676	8.44	.3323	8.54	.3362	8.64	.3400	8.73	.3438	8.83	.3477
	-	1.25	8.647	8.912	8.70	.3426	8.78	.3458	8.86	.3490	8.94	.3521	9.03	.3553
	-	1	8.917	9.153	8.96	.3528	9.03	.3553	9.09	.3579	9.16	.3605	9.22	.3630
	-	0.75	9.188	9.378	9.22	.3630	9.27	.3649	9.32	.3669	9.37	.3688	9.42	.3707
	-	0.5	9.459	9.599	9.48	.3732	9.51	.3745	9.55	.3758	9.58	.3771	9.61	.3784
M11	1.5	-	9.376	9.676	9.44	.3717	9.54	.3755	9.64	.3794	9.73	.3832	9.83	.3870
	-	1	9.917	10.153	9.96	.3922	10.03	.3947	10.09	.3973	10.16	.3998	10.22	.4024
	-	0.75	10.188	10.378	10.22	.4024	10.27	.4043	10.32	.4062	10.37	.4081	10.42	.4101
	-	0.5	10.459	10.599	10.48	.4126	10.51	.4139	10.55	.4152	10.58	.4164	10.61	.4177
M12	1.75	-	10.106	10.441	10.18	.4008	10.30	.4053	10.41	.4098	10.52	.4143	10.64	.4187
	-	1.5	10.376	10.676	10.44	.4111	10.54	.4149	10.64	.4187	10.73	.4226	10.83	.4264
	-	1.25	10.647	10.912	10.70	.4213	10.78	.4245	10.86	.4277	10.94	.4309	11.03	.4341
	-	1	10.917	11.153	10.96	.4315	11.03	.4341	11.09	.4366	11.16	.4392	11.22	.4418
	-	0.75	11.188	11.378	11.22	.4418	11.27	.4437	11.32	.4456	11.37	.4475	11.42	.4494
	-	0.5	11.459	11.599	11.48	.4520	11.51	.4533	11.55	.4545	11.58	.4558	11.61	.4571
M13	-	1.75	11.106	11.441	11.18	.4402	11.30	.4447	11.41	.4492	11.52	.4536	11.64	.4581
	-	1.5	11.376	11.676	11.44	.4504	11.54	.4543	11.64	.4581	11.73	.4619	11.83	.4658
	-	1.25	11.647	11.912	11.70	.4607	11.78	.4639	11.86	.4671	11.94	.4703	12.03	.4735
	-	1	11.917	12.153	11.96	.4709	12.03	.4735	12.09	.4760	12.16	.4786	12.22	.4811
	-	0.75	12.188	12.378	12.22	.4811	12.27	.4830	12.32	.4850	12.37	.4869	12.42	.4888
	-	0.5	12.459	12.599	12.48	.4914	12.51	.4926	12.55	.4939	12.58	.4952	12.61	.4965
M14	2	-	11.835	12.210	11.92	.4694	12.05	.4745	12.18	.4796	12.31	.4847	12.44	.4898
	-	1.5	12.376	12.676	12.44	.4898	12.54	.4936	12.64	.4975	12.73	.5013	12.83	.5052
	-	1.25	12.647	12.912	12.70	.5000	12.78	.5032	12.86	.5064	12.94	.5096	13.03	.5128
	-	1	12.917	13.153	12.96	.5103	13.03	.5128	13.09	.5154	13.16	.5179	13.22	.5205
	-	0.75	13.188	13.378	13.22	.5205	13.27	.5224	13.32	.5243	13.37	.5262	13.42	.5282
	-	0.5	13.459	13.599	13.48	.5307	13.51	.5320	13.55	.5333	13.58	.5346	13.61	.5358
M15	-	2	12.835	13.210	12.92	.5087	13.05	.5138	13.18	.5190	13.31	.5241	13.44	.5292
	-	1.5	13.376	13.676	13.44	.5292	13.54	.5330	13.64	.5369	13.73	.5407	13.83	.5445
	-	1.25	13.647	13.912	13.70	.5394	13.78	.5426	13.86	.5458	13.94	.5490	14.03	.5522
	-	1	13.917	14.153	13.96	.5496	14.03	.5522	14.09	.5548	14.16	.5573	14.22	.5599
	-	0.75	14.188	14.378	14.22	.5599	14.27	.5618	14.32	.5637	14.37	.5656	14.42	.5675
	-	0.5	14.459	14.599	14.48	.5701	14.51	.5714	14.55	.5727	14.58	.5739	14.61	.5752
M16	2	-	13.835	14.210	13.92	.5481	14.05	.5532	14.18	.5583	14.31	.5634	14.44	.5685
	-	1.5	14.376	14.676	14.44	.5685	14.54	.5724	14.64	.5762	14.73	.5801	14.83	.5839
	-	1	14.917	15.153	14.96	.5890	15.03	.5916	15.09	.5941	15.16	.5967	15.22	.5992
M17	-	2	14.835	15.210	14.92	.5875	15.05	.5926	15.18	.5977	15.31	.6028	15.44	.6079
	-	1.5	15.376	15.676	15.44	.6079	15.54	.6118	15.64	.6156	15.73	.6194	15.83	.6233
	-	1.25	15.647	15.912	15.70	.6181	15.78	.6213	15.86	.6245	15.94	.6277	16.03	.6309
	-	1	15.917	16.153	15.96	.6284	16.03	.6309	16.09	.6335	16.16	.6360	16.22	.6386
	-	0.75	16.188	16.378	16.22	.6386	16.27	.6405	16.32	.6424	16.37	.6444	16.42	.6463
	-	0.5	16.459	16.599	16.48	.6488	16.51	.6501	16.55	.6514	16.58	.6527	16.61	.6539
M18	2.5	-	15.294	15.744	15.40	.6064	15.56	.6128	15.73	.6192	15.89	.6256	16.05	.6319
	-	2	15.835	16.210	15.92	.6268	16.05	.6319	16.18	.6371	16.31	.6422	16.44	.6473
	-	1.5	16.376	16.676	16.44	.6473	16.54	.6511	16.64	.6550	16.73	.6588	16.83	.6626

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M/MF RECOMMENDED TAP DRILL SIZE
- METRIC THREAD

Size	Pitch		Minor Diameter		Tap Drill Diameter(Cutting Tap)									
	M	MF	Min. 6H	Max. 6H	80% Thread		75% Thread		70% Thread		65% Thread		60% Thread	
					mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
	-	1	16.917	17.153	16.96	.6677	17.03	.6703	17.09	.6729	17.16	.6754	17.22	.6780
M19	-	2.5	16.294	16.744	16.40	.6457	16.56	.6521	16.73	.6585	16.89	.6649	17.05	.6713
	-	2	16.835	17.210	16.92	.6662	17.05	.6713	17.18	.6764	17.31	.6815	17.44	.6867
	-	1.5	17.376	17.676	17.44	.6867	17.54	.6905	17.64	.6943	17.73	.6982	17.83	.7020
	-	1.25	17.647	17.912	17.70	.6969	17.78	.7001	17.86	.7033	17.94	.7065	18.03	.7097
	-	1	17.917	18.153	17.96	.7071	18.03	.7097	18.09	.7122	18.16	.7148	18.22	.7173
	-	0.75	18.188	18.378	18.22	.7173	18.27	.7193	18.32	.7212	18.37	.7231	18.42	.7250
	-	0.5	18.459	18.599	18.48	.7276	18.51	.7289	18.55	.7301	18.58	.7314	18.61	.7327
M20	2.5	-	17.294	17.744	17.40	.6851	17.56	.6915	17.73	.6979	17.89	.7043	18.05	.7107
	-	2	17.835	18.210	17.92	.7056	18.05	.7107	18.18	.7158	18.31	.7209	18.44	.7260
	-	1.5	18.376	18.676	18.44	.7260	18.54	.7299	18.64	.7337	18.73	.7375	18.83	.7414
	-	1	18.917	19.153	18.96	.7465	19.03	.7490	19.09	.7516	19.16	.7542	19.22	.7567
M21	-	2.5	18.294	18.744	18.40	.7245	18.56	.7309	18.73	.7373	18.89	.7437	19.05	.7501
	-	1.5	19.376	19.676	19.44	.7654	19.54	.7692	19.64	.7731	19.73	.7769	19.83	.7807
	-	1	19.917	20.153	19.96	.7859	20.03	.7884	20.09	.7910	20.16	.7935	20.22	.7961
M22	2.5	-	19.294	19.744	19.40	.7639	19.56	.7702	19.73	.7766	19.89	.7830	20.05	.7894
	-	2	19.835	20.210	19.92	.7843	20.05	.7894	20.18	.7945	20.31	.7997	20.44	.8048
	-	1.5	20.376	20.676	20.44	.8048	20.54	.8086	20.64	.8124	20.73	.8163	20.83	.8201
	-	1	20.917	21.153	20.96	.8252	21.03	.8278	21.09	.8303	21.16	.8329	21.22	.8355
M23	-	2.5	20.294	20.744	20.40	.8032	20.56	.8096	20.73	.8160	20.89	.8224	21.05	.8288
	-	2	20.835	21.210	20.92	.8237	21.05	.8288	21.18	.8339	21.31	.8390	21.44	.8441
	-	1.5	21.376	21.676	21.44	.8441	21.54	.8480	21.64	.8518	21.73	.8556	21.83	.8595
	-	1	21.917	22.153	21.96	.8646	22.03	.8672	22.09	.8697	22.16	.8723	22.22	.8748
M24	3	-	20.752	21.252	20.88	.8221	21.08	.8298	21.27	.8375	21.47	.8452	21.66	.8528
	-	2	21.835	22.210	21.92	.8631	22.05	.8682	22.18	.8733	22.31	.8784	22.44	.8835
	-	1.5	22.376	22.676	22.44	.8835	22.54	.8873	22.64	.8912	22.73	.8950	22.83	.8989
	-	1	22.917	23.153	22.96	.9040	23.03	.9065	23.09	.9091	23.16	.9116	23.22	.9142
M25	-	3	21.752	22.252	21.88	.8615	22.08	.8692	22.27	.8769	22.47	.8845	22.66	.8922
	-	2	22.835	23.210	22.92	.9024	23.05	.9075	23.18	.9127	23.31	.9178	23.44	.9229
	-	1.5	23.376	23.676	23.44	.9229	23.54	.9267	23.64	.9306	23.73	.9344	23.83	.9382
	-	1	23.917	24.153	23.96	.9433	24.03	.9459	24.09	.9485	24.16	.9510	24.22	.9536
M26	-	3	22.752	23.252	22.88	.9009	23.08	.9085	23.27	.9162	23.47	.9239	23.66	.9316
	-	2	23.835	24.210	23.92	.9418	24.05	.9469	24.18	.9520	24.31	.9571	24.44	.9623
	-	1.5	24.376	24.676	24.44	.9623	24.54	.9661	24.64	.9699	24.73	.9738	24.83	.9779
M27	3	-	23.752	24.252	23.88	.9402	24.08	.9479	24.27	.9556	24.47	.9633	24.66	.9709
	-	2.5	24.294	24.744	24.40	.9607	24.56	.9671	24.73	.9735	24.89	.9799	25.05	.9863
	-	2	24.835	25.210	24.92	.9812	25.05	.9863	25.18	.9914	25.31	.9965	25.44	1.0016
	-	1.5	25.376	25.676	25.44	1.0016	25.54	1.0055	25.64	1.0093	25.73	1.0131	25.83	1.0170
	-	1	25.917	26.153	25.96	1.0221	26.03	1.0246	26.09	1.0272	26.16	1.0297	26.22	1.0323
M28	-	3	24.752	25.252	24.88	.9796	25.08	.9873	25.27	.9950	25.47	1.0026	25.66	1.0103
	-	2	25.835	26.210	25.92	1.0205	26.05	1.0256	26.18	1.0308	26.31	1.0359	26.44	1.0410
	-	1.5	26.376	26.676	26.44	1.0410	26.54	1.0448	26.64	1.0487	26.73	1.0525	26.83	1.0563
	-	1	26.917	27.153	26.96	1.0614	27.03	1.0640	27.09	1.0666	27.16	1.0691	27.22	1.0717
M30	3.5	-	26.211	26.771	26.36	1.0379	26.59	1.0469	26.82	1.0558	27.04	1.0648	27.27	1.0737
	-	3	26.752	27.252	26.88	1.0584	27.08	1.0660	27.27	1.0737	27.47	1.0814	27.66	1.0890
	-	2	27.835	28.210	27.92	1.0993	28.05	1.1044	28.18	1.1095	28.31	1.1146	28.44	1.1197
	-	1.5	28.376	28.676	28.44	1.1197	28.54	1.1236	28.64	1.1274	28.73	1.1312	28.83	1.1351
	-	1	28.917	29.153	28.96	1.1402	29.03	1.1427	29.09	1.1453	29.16	1.1479	29.22	1.1504
M32	-	3	28.752	29.252	28.88	1.1371	29.08	1.1448	29.27	1.1524	29.47	1.1601	29.66	1.1678
	-	2	29.835	30.210	29.92	1.1780	30.05	1.1831	30.18	1.1882	30.31	1.1934	30.44	1.1985

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M/MF RECOMMENDED TAP DRILL SIZE
- METRIC THREAD

Size	Pitch		Minor Diameter		Tap Drill Diameter(Cutting Tap)									
	M	MF	Min. 6H	Max. 6H	80% Thread		75% Thread		70% Thread		65% Thread		60% Thread	
					mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
	-	1.5	30.376	30.676	30.44	1.1985	30.54	1.2023	30.64	1.2061	30.73	1.2100	30.83	1.2138
M33	3.5	-	29.211	29.771	29.36	1.1560	29.59	1.1650	29.82	1.1739	30.04	1.1829	30.27	1.1918
	-	3	29.752	30.252	29.88	1.1765	30.08	1.1841	30.27	1.1918	30.47	1.1995	30.66	1.2072
	-	2	30.835	31.210	30.92	1.2174	31.05	1.2225	31.18	1.2276	31.31	1.2327	31.44	1.2378
	-	1.5	31.376	31.676	31.44	1.2378	31.54	1.2417	31.64	1.2455	31.73	1.2493	31.83	1.2532
	-	1	31.917	32.153	31.96	1.2583	32.03	1.2609	32.09	1.2634	32.16	1.2660	32.22	1.2685
M34	-	3	30.752	31.252	30.88	1.2158	31.08	1.2235	31.27	1.2312	31.47	1.2389	31.66	1.2465
	-	2	31.835	32.210	31.92	1.2568	32.05	1.2619	32.18	1.2670	32.31	1.2721	32.44	1.2772
	-	1.5	32.376	32.676	32.44	1.2772	32.54	1.2810	32.64	1.2849	32.73	1.2887	32.83	1.2926
	-	1	32.917	33.153	32.96	1.2977	33.03	1.3002	33.09	1.3028	33.16	1.3053	33.22	1.3079
M35	-	3	31.752	32.252	31.88	1.2552	32.08	1.2629	32.27	1.2706	32.47	1.2782	32.66	1.2859
	-	1.5	33.376	33.676	33.44	1.3166	33.54	1.3204	33.64	1.3243	33.73	1.3281	33.83	1.3319
	-	1	33.917	34.153	33.96	1.3370	34.03	1.3396	34.09	1.3422	34.16	1.3447	34.22	1.3473
M36	4	-	31.670	32.270	31.84	1.2537	32.10	1.2639	32.36	1.2741	32.62	1.2844	32.88	1.2946
	-	3	32.752	33.252	32.88	1.2946	33.08	1.3023	33.27	1.3099	33.47	1.3176	33.66	1.3253
	-	2	33.835	34.210	33.92	1.3355	34.05	1.3406	34.18	1.3457	34.31	1.3508	34.44	1.3560
	-	1.5	34.376	34.676	34.44	1.3560	34.54	1.3598	34.64	1.3636	34.73	1.3675	34.83	1.3713
	-	1	34.917	35.153	34.96	1.3764	35.03	1.3790	35.09	1.3815	35.16	1.3841	35.22	1.3866
M37	-	1.5	35.376	35.676	35.44	1.3953	35.54	1.3992	35.64	1.4030	35.73	1.4068	35.83	1.4107
	-	1	35.917	36.153	35.96	1.4158	36.03	1.4183	36.09	1.4209	36.16	1.4234	36.22	1.4260
M38	-	4	33.670	34.270	33.84	1.3324	34.10	1.3426	34.36	1.3529	34.62	1.3631	34.88	1.3733
	-	3	34.752	35.252	34.88	1.3733	35.08	1.3810	35.27	1.3887	35.47	1.3963	35.66	1.4040
	-	2	35.835	36.210	35.92	1.4142	36.05	1.4193	36.18	1.4245	36.31	1.4296	36.44	1.4347
	-	1.5	36.376	36.676	36.44	1.4347	36.54	1.4385	36.64	1.4424	36.73	1.4462	36.83	1.4500
M39	4	-	34.670	35.270	34.84	1.3718	35.10	1.3820	35.36	1.3922	35.62	1.4025	35.88	1.4127
	-	3	35.752	36.252	35.88	1.4127	36.08	1.4204	36.27	1.4280	36.47	1.4357	36.66	1.4434
	-	2	36.835	37.210	36.92	1.4536	37.05	1.4587	37.18	1.4638	37.31	1.4689	37.44	1.4741
	-	1.5	37.376	37.676	37.44	1.4741	37.54	1.4779	37.64	1.4817	37.73	1.4856	37.83	1.4894
	-	1	37.917	38.153	37.96	1.4945	38.03	1.4971	38.09	1.4996	38.16	1.5022	38.22	1.5047
M40	-	4	35.670	36.270	35.84	1.4111	36.10	1.4214	36.36	1.4316	36.62	1.4418	36.88	1.4521
	-	3	36.752	37.252	36.88	1.4521	37.08	1.4597	37.27	1.4674	37.47	1.4751	37.66	1.4827
	-	2	37.835	38.210	37.92	1.4930	38.05	1.4981	38.18	1.5032	38.31	1.5083	38.44	1.5134
	-	1.5	38.376	38.676	38.44	1.5134	38.54	1.5173	38.64	1.5211	38.73	1.5249	38.83	1.5288
	-	1	38.917	39.153	38.96	1.5339	39.03	1.5364	39.09	1.5390	39.16	1.5416	39.22	1.5441
M42	4.5	-	37.129	37.799	37.32	1.4694	37.62	1.4809	37.91	1.4924	38.20	1.5039	38.49	1.5155
	-	4	37.670	38.270	37.84	1.4899	38.10	1.5001	38.36	1.5103	38.62	1.5206	38.88	1.5308
	-	3	38.752	39.252	38.88	1.5308	39.08	1.5385	39.27	1.5461	39.47	1.5538	39.66	1.5615
	-	2	39.835	40.210	39.92	1.5717	40.05	1.5768	40.18	1.5819	40.31	1.5871	40.44	1.5922
	-	1.5	40.376	40.676	40.44	1.5922	40.54	1.5960	40.64	1.5998	40.73	1.6037	40.83	1.6075
M45	4.5	-	40.129	40.799	40.32	1.5875	40.62	1.5990	40.91	1.6106	41.20	1.6221	41.49	1.6336
	-	4	40.670	41.270	40.84	1.6080	41.10	1.6182	41.36	1.6285	41.62	1.6387	41.88	1.6489
	-	3	41.752	42.252	41.88	1.6489	42.08	1.6566	42.27	1.6643	42.47	1.6719	42.66	1.6796
	-	2	42.835	43.210	42.92	1.6898	43.05	1.6949	43.18	1.7001	43.31	1.7052	43.44	1.7103
	-	1.5	43.376	43.676	43.44	1.7103	43.54	1.7141	43.64	1.7180	43.73	1.7218	43.83	1.7256
	-	1	43.917	44.153	43.96	1.7307	44.03	1.7333	44.09	1.7359	44.16	1.7384	44.22	1.7410
M46	-	1.5	44.376	44.676	44.44	1.7497	44.54	1.7535	44.64	1.7573	44.73	1.7612	44.83	1.7650
M48	5	-	42.587	43.297	42.80	1.6852	43.13	1.6980	43.45	1.7108	43.78	1.7235	44.10	1.7363
	-	4	43.670	44.270	43.84	1.7261	44.10	1.7363	44.36	1.7466	44.62	1.7568	44.88	1.7670
	-	3	44.752	45.252	44.88	1.7670	45.08	1.7747	45.27	1.7824	45.47	1.7900	45.66	1.7977
	-	2	45.835	46.210	45.92	1.8079	46.05	1.8130	46.18	1.8182	46.31	1.8233	46.44	1.8284

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M/MF RECOMMENDED TAP DRILL SIZE
- METRIC THREAD

Size	Pitch		Minor Diameter		Tap Drill Diameter(Cutting Tap)									
	M	MF	Min. 6H	Max. 6H	80% Thread		75% Thread		70% Thread		65% Thread		60% Thread	
					mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
	-	1.5	46.376	46.676	46.44	1.8284	46.54	1.8322	46.64	1.8361	46.73	1.8399	46.83	1.8437
	-	1	46.917	47.153	46.96	1.8488	47.03	1.8514	47.09	1.8540	47.16	1.8565	47.22	1.8591
M50	-	5	44.587	45.297	44.80	1.7639	45.13	1.7767	45.45	1.7895	45.78	1.8023	46.10	1.8151
	-	3	46.752	47.252	46.88	1.8458	47.08	1.8534	47.27	1.8611	47.47	1.8688	47.66	1.8764
	-	2	47.835	48.210	47.92	1.8867	48.05	1.8918	48.18	1.8969	48.31	1.9020	48.44	1.9071
	-	1.5	48.376	48.676	48.44	1.9071	48.54	1.9110	48.64	1.9148	48.73	1.9186	48.83	1.9225
	-	1	48.917	49.153	48.96	1.9276	49.03	1.9301	49.09	1.9327	49.16	1.9353	49.22	1.9378
M52	5	-	46.587	47.297	46.80	1.8427	47.13	1.8555	47.45	1.8682	47.78	1.8810	48.10	1.8938
	-	4	47.670	48.270	47.84	1.8836	48.10	1.8938	48.36	1.9040	48.62	1.9143	48.88	1.9245
	-	3	48.752	49.252	48.88	1.9245	49.08	1.9322	49.27	1.9398	49.47	1.9475	49.66	1.9552
	-	2	49.835	50.210	49.92	1.9654	50.05	1.9705	50.18	1.9756	50.31	1.9808	50.44	1.9859
	-	1.5	50.376	50.676	50.44	1.9859	50.54	1.9897	50.64	1.9935	50.73	1.9974	50.83	2.0012
M55	-	4	50.670	51.270	50.84	2.0017	51.10	2.0119	51.36	2.0222	51.62	2.0324	51.88	2.0426
	-	3	51.752	52.252	51.88	2.0426	52.08	2.0503	52.27	2.0580	52.47	2.0656	52.66	2.0733
	-	2	52.835	53.210	52.92	2.0835	53.05	2.0886	53.18	2.0938	53.31	2.0989	53.44	2.1040
	-	1.5	53.376	53.676	53.44	2.1040	53.54	2.1078	53.64	2.1117	53.73	2.1155	53.83	2.1193
M56	5.5	-	50.046	50.796	50.28	1.9797	50.64	1.9938	51.00	2.0078	51.36	2.0219	51.71	2.0360
	-	4	51.670	52.270	51.84	2.0411	52.10	2.0513	52.36	2.0615	52.62	2.0718	52.88	2.0820
	-	3	52.752	53.252	52.88	2.0820	53.08	2.0897	53.27	2.0973	53.47	2.1050	53.66	2.1127
	-	2	53.835	54.210	53.92	2.1229	54.05	2.1280	54.18	2.1331	54.31	2.1382	54.44	2.1434
	-	1.5	54.376	54.676	54.44	2.1434	54.54	2.1472	54.64	2.1510	54.73	2.1549	54.83	2.1587
M58	-	4	53.670	54.270	53.84	2.1198	54.10	2.1300	54.36	2.1403	54.62	2.1505	54.88	2.1607
	-	3	54.752	55.252	54.88	2.1607	55.08	2.1684	55.27	2.1761	55.47	2.1837	55.66	2.1914
	-	2	55.835	56.210	55.92	2.2016	56.05	2.2067	56.18	2.2119	56.31	2.2170	56.44	2.2221
	-	1.5	56.376	56.676	56.44	2.2221	56.54	2.2259	56.64	2.2298	56.73	2.2336	56.83	2.2374
M60	5.5	-	54.046	54.796	54.28	2.1372	54.64	2.1512	55.00	2.1653	55.36	2.1794	55.71	2.1934
	-	4	55.670	56.270	55.84	2.1985	56.10	2.2088	56.36	2.2190	56.62	2.2292	56.88	2.2395
	-	3	56.752	57.252	56.88	2.2395	57.08	2.2471	57.27	2.2548	57.47	2.2625	57.66	2.2701
	-	2	57.835	58.210	57.92	2.2804	58.05	2.2855	58.18	2.2906	58.31	2.2957	58.44	2.3008
	-	1.5	58.376	58.676	58.44	2.3008	58.54	2.3047	58.64	2.3085	58.73	2.3123	58.83	2.3162
M62	-	4	57.670	58.270	57.84	2.2773	58.10	2.2875	58.36	2.2977	58.62	2.3080	58.88	2.3182
	-	3	58.752	59.252	58.88	2.3182	59.08	2.3259	59.27	2.3335	59.47	2.3412	59.66	2.3489
	-	1	60.917	61.153	60.96	2.4000	61.03	2.4026	61.09	2.4051	61.16	2.4077	61.22	2.4103
	-	1.5	60.376	60.676	60.44	2.3796	60.54	2.3834	60.64	2.3872	60.73	2.3911	60.83	2.3949
M64	6	-	57.505	58.305	57.76	2.2742	58.15	2.2895	58.54	2.3049	58.93	2.3202	59.32	2.3356
	-	4	59.670	60.270	59.84	2.3560	60.10	2.3663	60.36	2.3765	60.62	2.3867	60.88	2.3969
	-	3	60.752	61.252	60.88	2.3969	61.08	2.4046	61.27	2.4123	61.47	2.4200	61.66	2.4276
	-	2	61.835	62.210	61.92	2.4379	62.05	2.4430	62.18	2.4481	62.31	2.4532	62.44	2.4583
	-	1.5	62.376	62.676	62.44	2.4583	62.54	2.4621	62.64	2.4660	62.73	2.4698	62.83	2.4737
M65	-	4	60.670	61.270	60.84	2.3954	61.10	2.4056	61.36	2.4159	61.62	2.4261	61.88	2.4363
	-	3	61.752	62.252	61.88	2.4363	62.08	2.4440	62.27	2.4517	62.47	2.4593	62.66	2.4670
	-	2	62.835	63.210	62.92	2.4772	63.05	2.4823	63.18	2.4875	63.31	2.4926	63.44	2.4977
	-	1.5	63.376	63.676	63.44	2.4977	63.54	2.5015	63.64	2.5054	63.73	2.5092	63.83	2.5130

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UNC/UNF RECOMMENDED TAP DRILL SIZE
- UNIFIED THREAD/FORMING TAPS

Size	Minor Diameter			Minor Diameter			Tap Drill Diameter(Forming Tap)				
	Min. 2B&3B	Max. 2B	Max. 3B	Min. 2B&3B	Max. 2B	Max. 3B	75% Thread	70% Thread	65% Thread	60% Thread	55% Thread
#0	-	80	-	.0465	.0514	.0514	.0536	.0541	.0545	.0549	.0553
#1	64	-	-	.0561	.0623	.0623	.0650	.0656	.0661	.0666	.0672
	-	72	-	.0580	.0635	.0635	.0659	.0664	.0669	.0673	.0678
#2	56	-	-	.0667	.0737	.0737	.0769	.0775	.0781	.0787	.0793
	-	64	-	.0691	.0753	.0753	.0780	.0786	.0791	.0796	.0802
#3	48	-	-	.0764	.0845	.0845	.0884	.0891	.0898	.0905	.0912
	-	56	-	.0797	.0865	.0865	.0899	.0905	.0911	.0917	.0923
#4	40	-	-	.0849	.0939	.0939	.0993	.1001	.1010	.1018	.1027
	-	48	-	.0894	.0968	.0968	.1014	.1021	.1028	.1035	.1042
#5	40	-	-	.0979	.1062	.1062	.1123	.1131	.1140	.1148	.1157
	-	44	-	.1004	.1079	.1079	.1134	.1142	.1150	.1157	.1165
#6	32	-	-	.1040	.1140	.1140	.1221	.1231	.1242	.1253	.1263
	-	40	-	.1110	.1190	.1186	.1253	.1261	.1270	.1278	.1287
#8	32	-	-	.1300	.1390	.1389	.1481	.1491	.1502	.1513	.1523
	-	36	-	.1340	.1420	.1416	.1498	.1508	.1517	.1527	.1536
#10	24	-	-	.1450	.1560	.1555	.1688	.1702	.1716	.1730	.1744
	-	32	-	.1560	.1640	.1641	.1741	.1751	.1762	.1773	.1783
#12	24	-	-	.1710	.1810	.1807	.1948	.1962	.1976	.1990	.2004
	-	28	-	.1770	.1860	.1857	.1978	.1990	.2002	.2014	.2026
	-	-	32	.1820	.1900	.1895	.2001	.2011	.2022	.2033	.2043
1/4	20	-	-	.1960	.2070	.2067	.2245	.2262	.2279	.2296	.2313
	-	28	-	.2110	.2200	.2190	.2318	.2330	.2342	.2354	.2366
	-	-	32	.2160	.2240	.2229	.2341	.2351	.2362	.2373	.2383
5/16	18	-	-	.2520	.2650	.2630	.2842	.2861	.2879	.2898	.2917
	-	24	-	.2670	.2770	.2754	.2913	.2927	.2941	.2955	.2969
	-	-	32	.2790	.2860	.2847	.2966	.2976	.2987	.2998	.3008
3/8	16	-	-	.3070	.3210	.3182	.3431	.3453	.3474	.3495	.3516
	-	24	-	.3300	.3400	.3372	.3538	.3552	.3566	.3580	.3594
	-	-	32	.3410	.3490	.3469	.3591	.3601	.3612	.3623	.3633
7/16	14	-	-	.3600	.3760	.3717	.4011	.4035	.4059	.4084	.4108
	-	20	-	.3830	.3950	.3916	.4120	.4137	.4154	.4171	.4188
	-	-	28	.3990	.4070	.4051	.4193	.4205	.4217	.4229	.4241
1/2	13	-	-	.4170	.4340	.4284	.4608	.4634	.4660	.4686	.4712
	-	20	-	.4460	.4570	.4537	.4745	.4762	.4779	.4796	.4813
	-	-	28	.4610	.4700	.4676	.4818	.4830	.4842	.4854	.4866
9/16	12	-	-	.4720	.4900	.4843	.5200	.5228	.5257	.5285	.5313
	-	18	-	.5020	.5150	.5106	.5342	.5361	.5379	.5398	.5417
	-	-	24	.5170	.5270	.5244	.5413	.5427	.5441	.5455	.5469
5/8	11	-	-	.5270	.5460	.5391	.5786	.5817	.5848	.5879	.5910
	-	18	-	.5650	.5780	.5730	.5967	.5986	.6004	.6023	.6042
	-	-	24	.5800	.5900	.5869	.6038	.6052	.6066	.6080	.6094
3/4	10	-	-	.6420	.6630	.6545	.6990	.7024	.7058	.7092	.7126
	-	16	-	.6820	.6960	.6908	.7181	.7203	.7224	.7245	.7266
	-	-	20	.6960	.7070	.7037	.7245	.7262	.7279	.7296	.7313

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UNC/UNF RECOMMENDED TAP DRILL SIZE
- UNIFIED THREAD/FORMING TAPS

Size	Minor Diameter			Minor Diameter			Tap Drill Diameter(Forming Tap)				
	Min. 2B&3B	Max. 2B	Max. 3B	Min. 2B&3B	Max. 2B	Max. 3B	75% Thread	70% Thread	65% Thread	60% Thread	55% Thread
7/8	9	-	-	.7550	.7780	.7681	.8183	.8221	.8259	.8297	.8334
	-	14	-	.7980	.8140	.8068	.8386	.8410	.8434	.8459	.8483
	-	-	20	.8210	.8320	.8287	.8495	.8512	.8529	.8546	.8563
1"	8	-	-	.8650	.8900	.8797	.9363	.9405	.9448	.9490	.9533
	-	12	-	.9100	.9280	.9198	.9575	.9603	.9632	.9660	.9688
	-	-	20	.9460	.9570	.9537	.9745	.9762	.9779	.9796	.9813
1*1/8	7	-	-	.9700	.9980	.9875	1.0521	1.0570	1.0619	1.0667	1.0716
	-	12	-	1.0350	1.0530	1.0448	1.0825	1.0853	1.0882	1.0910	1.0938
	-	-	18	1.0650	1.0780	1.0730	1.0967	1.0986	1.1004	1.1023	1.1042
1*1/4	7	-	-	1.0950	1.1230	1.1125	1.1771	1.1820	1.1869	1.1917	1.1966
	-	12	-	1.1600	1.1780	1.1698	1.2075	1.2103	1.2132	1.2160	1.2188
	-	-	18	1.1900	1.2030	1.1980	1.2217	1.2236	1.2254	1.2273	1.2292

M/MF RECOMMENDED TAP DRILL SIZE
- METRIC THREAD/FORMING TAPS

Size	Pitch		Minor Diameter		Tap Drill Diameter(Forming Tap)									
	M	MF	Min. 6H	Max. 6H	75% Thread		70% Thread		65% Thread		60% Thread		55% Thread	
					mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
M1	0.25	-	0.729	0.798	0.87	.0344	0.88	.0347	0.89	.0350	0.90	.0354	0.91	.0357
	-	0.2	0.783	0.841	0.90	.0354	0.90	.0356	0.91	.0359	0.92	.0362	0.93	.0364
M1.1	0.25	-	0.829	0.898	0.97	.0383	0.98	.0386	0.99	.0390	1.00	.0393	1.01	.0396
	-	0.2	0.883	0.941	1.00	.0393	1.00	.0396	1.01	.0398	1.02	.0401	1.03	.0404
M1.2	0.25	-	0.929	0.998	1.07	.0422	1.08	.0426	1.09	.0429	1.10	.0432	1.11	.0436
	-	0.2	0.983	1.041	1.10	.0432	1.10	.0435	1.11	.0438	1.12	.0440	1.13	.0443
M1.4	0.3	-	1.075	1.159	1.25	.0491	1.26	.0495	1.27	.0499	1.28	.0503	1.29	.0507
	-	0.2	1.183	1.241	1.30	.0511	1.30	.0514	1.31	.0516	1.32	.0519	1.33	.0522
M1.6	0.35	-	1.221	1.321	1.42	.0560	1.43	.0564	1.45	.0569	1.46	.0574	1.47	.0578
	-	0.2	1.383	1.441	1.50	.0590	1.50	.0592	1.51	.0595	1.52	.0598	1.53	.0600
M1.7	0.35	-	1.321	1.421	1.52	.0599	1.53	.0604	1.55	.0608	1.56	.0613	1.57	.0618
	-	0.3	1.375	1.459	1.55	.0609	1.56	.0613	1.57	.0617	1.58	.0621	1.59	.0625
	-	0.25	1.429	1.498	1.57	.0619	1.58	.0622	1.59	.0626	1.60	.0629	1.61	.0632
	-	0.2	1.483	1.541	1.60	.0629	1.60	.0632	1.61	.0634	1.62	.0637	1.63	.0640
M1.8	0.35	-	1.421	1.521	1.62	.0638	1.63	.0643	1.65	.0648	1.66	.0652	1.67	.0657
	-	0.2	1.583	1.641	1.70	.0669	1.70	.0671	1.71	.0674	1.72	.0677	1.73	.0679
M2	0.4	-	1.567	1.679	1.80	.0707	1.81	.0712	1.82	.0718	1.84	.0723	1.85	.0729
	-	0.25	1.729	1.798	1.87	.0737	1.88	.0741	1.89	.0744	1.90	.0747	1.91	.0751
M2.2	0.45	-	1.713	1.838	1.97	.0776	1.99	.0782	2.00	.0788	2.02	.0794	2.03	.0800
	-	0.25	1.929	1.998	2.07	.0816	2.08	.0819	2.09	.0823	2.10	.0826	2.11	.0829
M2.3	0.4	-	1.867	1.979	2.10	.0825	2.11	.0831	2.12	.0836	2.14	.0841	2.15	.0847
	-	0.35	1.921	2.021	2.12	.0835	2.13	.0840	2.15	.0845	2.16	.0849	2.17	.0854
	-	0.25	2.029	2.098	2.17	.0855	2.18	.0859	2.19	.0862	2.20	.0865	2.21	.0869
M2.5	0.45	-	2.013	2.138	2.27	.0894	2.29	.0900	2.30	.0906	2.32	.0912	2.33	.0918
	-	0.35	2.121	2.221	2.32	.0914	2.33	.0919	2.35	.0923	2.36	.0928	2.37	.0933
M2.6	0.45	-	2.113	2.238	2.37	.0933	2.39	.0939	2.40	.0945	2.42	.0951	2.43	.0957
	-	0.35	2.221	2.321	2.42	.0953	2.43	.0958	2.45	.0963	2.46	.0967	2.47	.0972
M3	0.5	-	2.459	2.599	2.75	.1081	2.76	.1087	2.78	.1094	2.80	.1101	2.81	.1107
	-	0.35	2.621	2.721	2.82	.1111	2.83	.1116	2.85	.1120	2.86	.1125	2.87	.1130
M3.5	0.6	-	2.850	3.010	3.19	.1257	3.21	.1266	3.23	.1274	3.26	.1282	3.28	.1290
	-	0.35	3.121	3.221	3.32	.1308	3.33	.1312	3.35	.1317	3.36	.1322	3.37	.1326
M4	0.7	-	3.242	3.422	3.64	.1434	3.67	.1444	3.69	.1453	3.71	.1462	3.74	.1472
	-	0.5	3.459	3.599	3.75	.1474	3.76	.1481	3.78	.1488	3.80	.1494	3.81	.1501
M4.5	0.75	-	3.688	3.878	4.12	.1621	4.14	.1631	4.17	.1641	4.19	.1651	4.22	.1661
	-	0.5	3.959	4.099	4.25	.1671	4.26	.1678	4.28	.1685	4.30	.1691	4.31	.1698
M5	0.9	-	4.026	4.226	4.54	.1788	4.57	.1800	4.60	.1812	4.63	.1824	4.66	.1836
	0.8	-	4.134	4.334	4.59	.1808	4.62	.1819	4.65	.1829	4.67	.1840	4.70	.1851
	-	0.5	4.459	4.599	4.75	.1868	4.76	.1875	4.78	.1881	4.80	.1888	4.81	.1895
M6	1	-	4.917	5.153	5.49	.2161	5.52	.2175	5.56	.2188	5.59	.2202	5.63	.2215
	-	0.75	5.188	5.378	5.62	.2212	5.64	.2222	5.67	.2232	5.69	.2242	5.72	.2252
	-	0.5	5.459	5.599	5.75	.2262	5.76	.2269	5.78	.2275	5.80	.2282	5.81	.2289
M7	1	-	5.917	6.153	6.49	.2555	6.52	.2569	6.56	.2582	6.59	.2595	6.63	.2609
	-	0.75	6.188	6.378	6.62	.2605	6.64	.2615	6.67	.2625	6.69	.2635	6.72	.2645
	-	0.5	6.459	6.599	6.75	.2656	6.76	.2662	6.78	.2669	6.80	.2676	6.81	.2682
M8	1.25	-	6.647	6.912	7.36	.2899	7.41	.2915	7.45	.2932	7.49	.2949	7.53	.2966
	-	1	6.917	7.153	7.49	.2949	7.52	.2962	7.56	.2976	7.59	.2989	7.63	.3002
	-	0.75	7.188	7.378	7.62	.2999	7.64	.3009	7.67	.3019	7.69	.3029	7.72	.3039
	-	0.5	7.459	7.599	7.75	.3049	7.76	.3056	7.78	.3063	7.80	.3069	7.81	.3076
M9	1.25	-	7.647	7.912	8.36	.3292	8.41	.3309	8.45	.3326	8.49	.3343	8.53	.3359
	-	1	7.917	8.153	8.49	.3343	8.52	.3356	8.56	.3369	8.59	.3383	8.63	.3396

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M/MF RECOMMENDED TAP DRILL SIZE
- METRIC THREAD/FORMING TAPS

Size	Pitch		Minor Diameter		Tap Drill Diameter(Forming Tap)									
	M	MF	Min. 6H	Max. 6H	75% Thread		70% Thread		65% Thread		60% Thread		55% Thread	
					mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
	-	0.75	8.188	8.378	8.62	.3393	8.64	.3403	8.67	.3413	8.69	.3423	8.72	.3433
	-	0.5	8.459	8.599	8.75	.3443	8.76	.3450	8.78	.3456	8.80	.3463	8.81	.3470
M10	1.5	-	8.376	8.676	9.24	.3636	9.29	.3656	9.34	.3676	9.39	.3696	9.44	.3716
	-	1.25	8.647	8.912	9.36	.3686	9.41	.3703	9.45	.3719	9.49	.3736	9.53	.3753
	-	1	8.917	9.153	9.49	.3736	9.52	.3750	9.56	.3763	9.59	.3776	9.63	.3790
	-	0.75	9.188	9.378	9.62	.3786	9.64	.3796	9.67	.3806	9.69	.3817	9.72	.3827
	-	0.5	9.459	9.599	9.75	.3837	9.76	.3843	9.78	.3850	9.80	.3857	9.81	.3863
M12	1.75	-	10.106	10.441	11.11	.4373	11.17	.4396	11.23	.4420	11.29	.4443	11.35	.4467
	-	1.5	10.376	10.676	11.24	.4423	11.29	.4443	11.34	.4463	11.39	.4483	11.44	.4504
	-	1.25	10.647	10.912	11.36	.4473	11.41	.4490	11.45	.4507	11.49	.4524	11.53	.4540
	-	1	10.917	11.153	11.49	.4524	11.52	.4537	11.56	.4550	11.59	.4564	11.63	.4577
	-	0.75	11.188	11.378	11.62	.4574	11.64	.4584	11.67	.4594	11.69	.4604	11.72	.4614
	-	0.5	11.459	11.599	11.75	.4624	11.76	.4631	11.78	.4637	11.80	.4644	11.81	.4651
M14	2	-	11.835	12.210	12.98	.5110	13.05	.5137	13.12	.5164	13.18	.5191	13.25	.5217
	-	1.5	12.376	12.676	13.24	.5211	13.29	.5231	13.34	.5251	13.39	.5271	13.44	.5291
	-	1.25	12.647	12.912	13.36	.5261	13.41	.5278	13.45	.5294	13.49	.5311	13.53	.5328
	-	1	12.917	13.153	13.49	.5311	13.52	.5324	13.56	.5338	13.59	.5351	13.63	.5365
	-	0.75	13.188	13.378	13.62	.5361	13.64	.5371	13.67	.5381	13.69	.5391	13.72	.5401
	-	0.5	13.459	13.599	13.75	.5411	13.76	.5418	13.78	.5425	13.80	.5431	13.81	.5438
M16	2	-	13.835	14.210	14.98	.5898	15.05	.5924	15.12	.5951	15.18	.5978	15.25	.6005
	-	1.5	14.376	14.676	15.24	.5998	15.29	.6018	15.34	.6038	15.39	.6058	15.44	.6078
	-	1	14.917	15.153	15.49	.6098	15.52	.6112	15.56	.6125	15.59	.6139	15.63	.6152
M18	2.5	-	15.294	15.744	16.73	.6585	16.81	.6618	16.90	.6652	16.98	.6685	17.07	.6719
	-	2	15.835	16.210	16.98	.6685	17.05	.6712	17.12	.6739	17.18	.6765	17.25	.6792
	-	1.5	16.376	16.676	17.24	.6785	17.29	.6806	17.34	.6826	17.39	.6846	17.44	.6866
	-	1	16.917	17.153	17.49	.6886	17.52	.6899	17.56	.6913	17.59	.6926	17.63	.6939
M20	2.5	-	17.294	17.744	18.73	.7372	18.81	.7406	18.90	.7439	18.98	.7472	19.07	.7506
	-	2	17.835	18.210	18.98	.7472	19.05	.7499	19.12	.7526	19.18	.7553	19.25	.7580
	-	1.5	18.376	18.676	19.24	.7573	19.29	.7593	19.34	.7613	19.39	.7633	19.44	.7653
	-	1	18.917	19.153	19.49	.7673	19.52	.7687	19.56	.7700	19.59	.7713	19.63	.7727
M22	2.5	-	19.294	19.744	20.73	.8159	20.81	.8193	20.90	.8226	20.98	.8260	21.07	.8293
	-	2	19.835	20.210	20.98	.8260	21.05	.8287	21.12	.8313	21.18	.8340	21.25	.8367
	-	1.5	20.376	20.676	21.24	.8360	21.29	.8380	21.34	.8400	21.39	.8420	21.44	.8441
	-	1	20.917	21.153	21.49	.8461	21.52	.8474	21.56	.8487	21.59	.8501	21.63	.8514
M24	3	-	20.752	21.252	22.47	.8846	22.57	.8887	22.67	.8927	22.78	.8967	22.88	.9007
	-	2	21.835	22.210	22.98	.9047	23.05	.9074	23.12	.9101	23.18	.9128	23.25	.9154
	-	1.5	22.376	22.676	23.24	.9148	23.29	.9168	23.34	.9188	23.39	.9208	23.44	.9228
	-	1	22.917	23.153	23.49	.9248	23.52	.9261	23.56	.9275	23.59	.9288	23.63	.9302
M26	-	3	22.752	23.252	24.47	.9634	24.57	.9674	24.67	.9714	24.78	.9754	24.88	.9794
	-	2	23.835	24.210	24.98	.9835	25.05	.9861	25.12	.9888	25.18	.9915	25.25	.9942
	-	1.5	24.376	24.676	25.24	.9935	25.29	.9955	25.34	.9975	25.39	.9995	25.44	1.0015
M27	3	-	23.752	24.252	25.47	1.0028	25.57	1.0068	25.67	1.0108	25.78	1.0148	25.88	1.0188
	-	2.5	24.294	24.744	25.73	1.0128	25.81	1.0161	25.90	1.0195	25.98	1.0228	26.07	1.0262
	-	2	24.835	25.210	25.98	1.0228	26.05	1.0255	26.12	1.0282	26.18	1.0309	26.25	1.0335
	-	1.5	25.376	25.676	26.24	1.0329	26.29	1.0349	26.34	1.0369	26.39	1.0389	26.44	1.0409
	-	1	25.917	26.153	26.49	1.0429	26.52	1.0443	26.56	1.0456	26.59	1.0469	26.63	1.0483
M30	3.5	-	26.211	26.771	28.22	1.1108	28.33	1.1155	28.45	1.1202	28.57	1.1249	28.69	1.1296
	-	3	26.752	27.252	28.47	1.1209	28.57	1.1249	28.67	1.1289	28.78	1.1329	28.88	1.1369
	-	2	27.835	28.210	28.98	1.1409	29.05	1.1436	29.12	1.1463	29.18	1.1490	29.25	1.1517
	-	1.5	28.376	28.676	29.24	1.1510	29.29	1.1530	29.34	1.1550	29.39	1.1570	29.44	1.1590
	-	1	28.917	29.153	29.49	1.1610	29.52	1.1624	29.56	1.1637	29.59	1.1650	29.63	1.1664

TAP RECOMMENDATIONS FOR CLASSES OF THREAD - INCH

Internal Screw Thread Classes and Tap Recommendations

Size	Threads per Inch		Recommended Tap for Class of Thread				Pitch Diameter Limits for Class of Thread				
			Unified Class of Thread		American National Class of Thread		Min. All Class (Basic)	Unified Class of Thread		American National Class of Thread	
	UNC	UNF	Class 2	Class 3	Class 2B	Class 3B		Max. Class 2	Max. Class 3	Max. Class 2B	Max. Class 3B
#0	–	80	H1	H1	H2	H1	.0519	.0536	.0532	.0542	.0536
#1	64	–	H1	H1	H2	H1	.0629	.0648	.0643	.0655	.0648
#1	–	72	H1	H1	H2	H1	.0640	.0658	.0653	.0665	.0659
#2	56	–	H1	H1	H2	H1	.0744	.0764	.0759	.0772	.0765
#2	–	64	H1	H1	H2	H1	.0759	.0778	.0773	.0786	.0779
#3	48	–	H1	H1	H2	H1	.0855	.0877	.0871	.0885	.0877
#3	–	56	H1	H1	H2	H1	.0874	.0894	.8890	.0902	.0895
#4	40	–	H2	H1	H2	H2	.0958	.0982	.0975	.0991	.0982
#4	–	48	H1	H1	H2	H1	.0985	.1007	.1001	.1016	.1008
#5	40	–	H2	H1	H2	H2	.1088	.1112	.1105	.1121	.1113
#5	–	44	H1	H1	H2	H1	.1102	.1125	.1118	.1134	.1126
#6	32	–	H2	H1	H3	H2	.1177	.1204	.1196	.1214	.1204
#6	–	40	H2	H1	H2	H2	.1218	.1242	.1235	.1252	.1243
#8	32	–	H2	H1	H3	H2	.1437	.1464	.1456	.1475	.1465
#8	–	36	H2	H1	H2	H2	.1460	.1485	.1478	.1496	.1487
#10	24	–	H3	H1	H3	H3	.1629	.1662	.1653	.1672	.1661
#10	–	32	H2	H1	H3	H2	.1697	.1724	.1716	.1736	.1726
#12	24	–	H3	H1	H3	H3	.1889	.1922	.1913	.1933	.1922
#12	–	28	H3	H1	H3	H3	.1928	.1959	.1950	.1970	.1959
1/4	20	–	H3	H2	H5	H3	.2175	.2211	.2201	.2223	.2211
1/4	–	28	H3	H1	H4	H3	.2268	.2299	.2290	.2311	.2300
5/16	18	–	H3	H2	H5	H3	.2764	.2805	.2794	.2817	.2803
5/16	–	24	H3	H1	H4	H3	.2854	.2887	.2878	.2902	.2890
3/8	16	–	H3	H2	H5	H3	.3344	.3389	.3376	.3401	.3387
3/8	–	24	H3	H1	H4	H3	.3479	.3512	.3503	.3528	.3516
7/16	14	–	H5	H3	H5	H3	.3911	.3960	.3947	.3972	.3957
7/16	–	20	H3	H1	H5	H3	.4050	.4086	.4076	.4104	.4091
1/2	13	–	H5	H3	H5	H3	.4500	.4552	.4537	.4565	.4548
1/2	–	20	H3	H1	H5	H3	.4675	.4711	.4701	.4731	.4717
9/16	12	–	H5	H3	H5	H3	.5084	.5140	.5124	.5152	.5135
9/16	–	18	H3	H2	H5	H3	.5264	.5305	.5294	.5323	.5308
5/8	11	–	H5	H3	H5	H3	.5660	.5719	.5702	.5732	.5714
5/8	–	18	H3	H2	H5	H3	.5889	.5930	.5919	.5949	.5934
3/4	10	–	H5	H3	H5	H3	.6850	.6914	.6895	.6927	.6907
3/4	–	16	H3	H2	H5	H3	.7094	.7139	.7126	.7159	.7143
7/8	9	–	H6	H4	H6	H4	.8028	.8098	.8077	.8110	.8089
7/8	–	14	H4	H2	H6	H4	.8286	.8335	.8322	.8356	.8339
1	8	–	H6	H4	H6	H4	.9188	.9264	.9242	.9276	.9254
1	–	12	H4	H2	H6	H4	.9459	.9515	.9499	.9535	.9516

The above recommended taps normally produce the Class of Thread indicated in average materials when used with reasonable care.
However, if the tap specified does not give a satisfactory gage fit in the work, a choice of some other limit tap will be necessary.

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TAP RECOMMENDATIONS FOR CLASSES OF THREAD - METRIC

Size	Pitch	Recommended Tap for Class of Thread		Pitch Diameter Limits for Class of Thread (mm)			Pitch Diameter Limits for Class of Thread (inch)		
		4H	6H	Min. (Basic)	Max. 4H	Max. 6H	Min. (Basic)	Max. 4H	Max. 6H
M1.6	0.35	D1	D3	1.373	1.426	1.458	.05406	.05614	.05740
M2	0.40	D1	D3	1.740	1.796	1.830	.06850	.07071	.07205
M2.5	0.45	D1	D3	2.208	2.268	2.303	.08693	.08929	.09067
M3	0.50	D1	D3	2.675	2.738	2.775	.10531	.10780	.10925
M3.5	0.60	D1	D4	3.110	3.181	3.222	.12244	.12524	.12685
M4	0.70	D2	D4	3.545	3.620	3.663	.13957	.14252	.14421
M4.5	0.75	D2	D4	4.013	4.088	4.131	.15789	.16094	.16264
M5	0.80	D2	D4	4.480	4.560	4.605	.17638	.17953	.18130
M6	1.00	D3	D5	5.350	5.445	5.500	.21063	.21437	.21654
M7	1.00	D3	D5	6.350	6.445	6.500	.25000	.25374	.25591
M8	1.25	D3	D5	7.188	7.288	7.348	.28299	.28693	.28929
M10	1.50	D3	D6	9.026	9.138	9.206	.35535	.35976	.36244
M12	1.75	D3	D6	10.863	10.988	11.063	.42768	.43260	.43555
M14	2.00	D3	D7	12.701	12.833	12.913	.50004	.50524	.50839
M16	2.00	D4	D7	14.701	14.833	14.913	.57878	.58398	.58713
M20	2.50	D4	D7	18.376	18.516	18.600	.72346	.72898	.73228
M24	3.00	D4	D8	22.051	22.221	22.316	.86815	.87484	.87858
M30	3.50	D5	D9	27.727	27.907	28.007	1.09161	1.0987	1.10264
M36	4.00	D5	D9	33.402	33.592	33.702	1.31504	1.32252	1.32685

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