



## HIGH PERFORMANCE TAPS RECOMMENDATION TABLE

Super HSS : Premium HSS Metallurgy  
 P-HSS : Powdered Metallurgy  
 HSSE-V3 : 3% Vanadium Alloy HSS-EX  
 HSS-V : Vanadium Alloy HSS

⊙ = RECOMMENDED  
 ○ = SUITABLE

COOLANT  
 A = Cutting Oil  
 T = Oil Emulsion  
 X = Cutting Oil/Oil Emulsion

					GV	GV	GV	GV	GV	GV			
					TKR03	ZF	Z0/Z1/Z2/Z3	Z4/Z5/Z6/Z7	Z8/ZA/ZC Z9/ZB/ZD	T7R01/T8R01/THR01 T7R02/T8R02/THR02			
					DESCRIPTION								
					PAGE								
					THREADS								
					TAP MATERIALS								
					CHAMFER LENGTH								
					SURFACE TREATMENT								
					SPIRAL FLUTE ANGLE								
					THREAD DEPTH								
					HOLE TYPE								
Material Group	Material Sub-Group	ISO	Hardness (HRC)	Hardness (BHN)	Cutting Speed (SFM)		COOLANT						
					Uncoated	Coated							
Steel	Low carbon steels Free machining carbon steels	P	< 15	< 180	25 - 50	50 - 80	T	⊙	⊙	⊙	⊙	⊙	⊙
	Medium to high carbon steels Low alloyed steels	P	< 23	< 240	25 - 50	50 - 80	T	⊙		⊙	⊙	⊙	⊙
	Steel castings & forgings Heat-treatable alloy steels	P	> 24 ≤ 38	> 250 ≤ 350	6 - 30	10 - 35	X						
	Alloyed tool steels Mold steels	P	> 38 ≤ 44	> 350 ≤ 420	6 - 12	-	A						
Stainless Steel	Free machining stainless steels	M	< 23	< 240	12 - 35	20 - 50	A	⊙	⊙	⊙	⊙	⊙	○
	Heat-and corrosion-resistant stainless steels Valve stainless steels	M	> 24 ≤ 38	> 250 ≤ 350	12 - 15	12 - 15	A						
	Stainless steel castings Precipitation hardening stainless steels	M	> 38 ≤ 44	> 350 ≤ 420	12 - 15	-	A						
Cast Iron	Grey cast iron	K	-	≤ 220	35 - 50	50 - 65	T						
	Nodular cast iron / Chilled cast iron Meehanite iron / Ductile iron	K	-	≥ 250	12 - 45	25 - 55	X						
Copper	Pure and alloyed copper	N	-	-	50 - 60	65 - 100	T	⊙		⊙	⊙	⊙	○
Brass	Free machining brass Alloyed brass	N	-	-	30 - 65	-	T	⊙		⊙	⊙	⊙	○
Bronze		N	44	< 420	12 - 20	35 - 80	T						
Aluminum	Pure Aluminum Aluminum alloys	N	-	-	50 - 65	-	T	⊙	⊙	⊙	⊙	⊙	⊙
	Aluminum alloy castings	N	-	-	40 - 65	45 - 90	T	⊙	⊙	⊙	⊙	⊙	⊙
Zinc		N	-	-	25 - 65	50 - 80	T	⊙		⊙	⊙	⊙	○
Magnesium		N	-	-	-	45 - 100	T	⊙		⊙	⊙	⊙	○
Nickel Alloys	718 & 625 INCON / Waspaloy Hastelloyn / Invar Moneln / Incoloy	S	≤ 38	≤ 350	10 - 15	-	A						
	718 Inconel A286	S	> 38 ≤ 44	> 350 ≤ 420	10 - 12	-	A						
Titanium		S	≤ 38	≤ 350	3 - 15	-	A						



**FORMING TAPS**

**T7R01/T8R01/THR01** SERIES

**T7R02/T8R02/THR02** SERIES

**FORMING TAPS PLUG & BOTTOMING STYLE**

THREAD MILLS

COMBO TAPS

SPIRAL FLUTE TAPS

SPIRAL POINT TAPS

STRAIGHT FLUTE TAPS

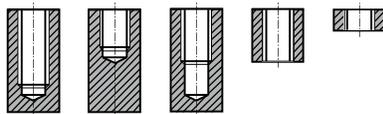
FORMING TAPS

SCREW THREAD INSERT TAPS

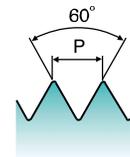
PIPE TAPS

TECHNICAL DATA

Hole type 3.0×D



USCTI



GV HSS UNC UNF USCTI 302A H2~H5 60° 4P~5P Plug 1.5P~2P Bottoming Bright TiN TiCN

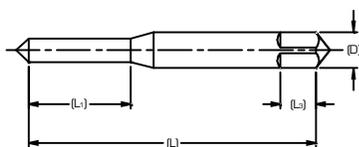
SIZE	Thread Per Inch		Limit	EDP No.					
	UNC	UNF		Plug			Bottoming		
				Bright	TiN	TiCN	Bright	TiN	TiCN
#0	—	80	H2	—	—	—	T7R02022	T8R02022	THR02022
#2	56	—	H2	—	—	—	T7R02082	T8R02082	THR02082
#3	48	—	H3	—	—	—	T7R02123	T8R02123	THR02123
#4	40	—	H3	T7R01163	T8R01163	THR01163	T7R02163	T8R02163	THR02163
#5	40	—	H3	T7R01203	T8R01203	THR01203	T7R02203	T8R02203	THR02203
#6	32	—	H3	T7R01243	T8R01243	THR01243	T7R02243	T8R02243	THR02243
#8	32	—	H3	T7R01283	T8R01283	THR01283	T7R02283	T8R02283	THR02283
#10	24	—	H4	T7R01324	T8R01324	THR01324	T7R02324	T8R02324	THR02324
#10	—	32	H4	T7R01344	T8R01344	THR01344	T7R02344	T8R02344	THR02344
1/4	20	—	H4	T7R01404	T8R01404	THR01404	T7R02404	T8R02404	THR02404
1/4	—	28	H4	T7R01424	T8R01424	THR01424	T7R02424	T8R02424	THR02424
5/16	18	—	H5	T7R01445	T8R01445	THR01445	T7R02445	T8R02445	THR02445
3/8	16	—	H5	T7R01485	T8R01485	THR01485	T7R02485	T8R02485	THR02485

► For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 497.

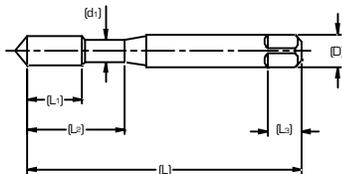
◎ : Excellent ○ : Good

P				M				K		
Low carbon steels/ Free machining carbon steels	Medium to high carbon steels/ Low alloyed steels	Steel castings & forgings / Heat-treatable alloy steels	Alloyed tool steels / Mold steels	Free machining stainless steels	Heat and corrosion resistant stainless steels / Valve stainless steels	Stainless steel castings / Precipitation hardening stainless steels	Grey cast iron			
◎	○			◎						
K		N					S			
Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron	Pure and alloyed copper	Free machining brass / Alloyed brass	Bronze	Pure Aluminum/ Aluminum alloy	Aluminum alloy castings	Zinc	Magnesium	718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy	718 Inconel / A286	Titanium
	○	○		○	○	○	○			

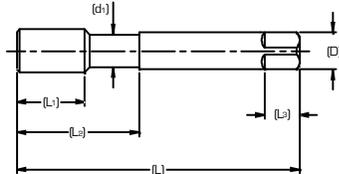
## 8 STANDARD FORMING TAP DIMENSION



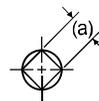
Blank Design (1)



Blank Design (2)



Blank Design (3)



### Forming Tap Blank (Inch)

Nominal Size	Overall Length (L)	Thread Length (L <sub>1</sub> )	Neck Length (L <sub>2</sub> )	Shank Diameter (D)	Square Length (L <sub>3</sub> )	Square Size (a)	Blank Design No.
#0	1.63	.31	—	.141	.19	.110	1
#1	1.69	.38	—	.141	.19	.110	1
#2	1.75	.44	—	.141	.19	.110	1
#3	1.81	.50	—	.141	.19	.110	1
#4	1.88	.56	—	.141	.19	.110	1
#5	1.94	.63	—	.141	.19	.110	1
#6	2.00	.48	.69	.141	.19	.110	1
#8	2.13	.50	.75	.168	.25	.131	1
#10	2.38	.63	.88	.194	.25	.152	1
#12	2.38	.63	.94	.220	.28	.165	1
1/4	2.50	.86	1.00	.255	.31	.191	2
5/16	2.72	.93	1.13	.318	.38	.238	2
3/8	2.94	.98	1.25	.381	.44	.286	2
7/16	3.16	.95	1.44	.323	.41	.242	3
1/2	3.38	1.00	1.60	.367	.44	.275	3
9/16	3.59	1.00	1.66	.429	.50	.322	3
5/8	3.81	1.00	1.81	.480	.56	.360	3
3/4	4.25	1.00	2.0	.590	.69	.442	3

### Forming Tap Blank (Metric)

Nominal Size	Overall Length (L)	Thread Length (L <sub>1</sub> )	Neck Length (L <sub>2</sub> )	Shank Diameter (D)	Square Length (L <sub>3</sub> )	Square Size (a)	Blank Design No.
M2	1.75	.40	—	.141	.19	.110	1
M3	1.94	.63	—	.141	.19	.110	1
M4	2.13	.50	.75	.168	.25	.131	1
M5	2.38	.63	.88	.194	.25	.152	1
M6	2.50	.86	1.0	.255	.31	.191	2
M8	2.72	.93	1.13	.318	.38	.238	2
M10	2.94	.98	1.25	.381	.44	.286	2
M12	3.38	1.00	1.60	.367	.44	.275	3



## TAP DRILL SIZES - UNIFIED THREAD / FORMING TAPS

Size	Threads Per Inch			Minor Diameter			Tap Drill Diameter (Cutting Tap)				
	UNC	UNF	UNEF	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
1/4	-	-	32	.1820	.1900	.1895	.2001	.2011	.2022	.2033	.2043
	20	-	-	.1960	.2070	.2067	.2245	.2262	.2279	.2296	.2313
	-	28	-	.2110	.2200	.2190	.2318	.2330	.2342	.2354	.2366
5/16	-	-	32	.2160	.2240	.2229	.2341	.2351	.2362	.2373	.2383
	18	-	-	.2520	.2650	.2630	.2842	.2861	.2879	.2898	.2917
	-	24	-	.2670	.2770	.2754	.2913	.2927	.2941	.2955	.2969
	-	-	-	.2740	.2820	.2807	.2943	.2955	.2967	.2979	.2991
3/8	-	-	32	.2790	.2860	.2847	.2966	.2976	.2987	.2998	.3008
	16	-	-	.3070	.3210	.3182	.3431	.3453	.3474	.3495	.3516
	-	24	-	.3300	.3400	.3372	.3538	.3552	.3566	.3580	.3594
	-	-	-	.3360	.3450	.3426	.3568	.3580	.3592	.3604	.3616
7/16	-	-	32	.3410	.3490	.3469	.3591	.3601	.3612	.3623	.3633
	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
	-	-	-	.5570	.5710	.5662	.5931	.5953	.5974	.5995	.6016
	-	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

Size	Threads Per Inch			Minor Diameter			Tap Drill Diameter (Cutting Tap)				
	UNC	UNF	UNEF	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