









## 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 Hastelloy / Invar Monel / 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

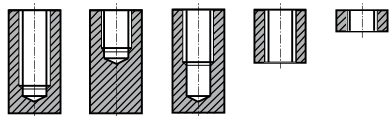
FORMING TAPS

SCREW THREAD INSERT TAPS

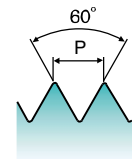
PIPE TAPS

TECHNICAL DATA

Hole type 3.0xD



USCTI



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

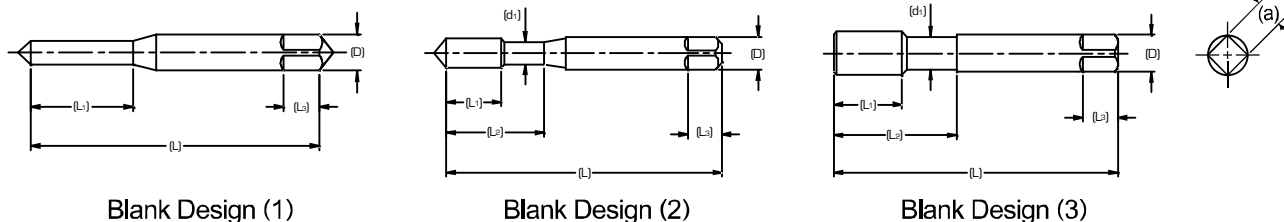
SIZE	Thread Per Inch		Limit	EDP No.					
	UNC	UNF		Plug			Bottoming		
				Bright	TiN	TiCN	Bright	TiN	TiCN
#0	—	80	H2	—	—	—	T7R02022	T8R02022	THR02022
#2	56	—	H2	—	—	—	T7R02082	T8R02082	THR02082
#3	48	—	H3	—	—	—	T7R02123	T8R02123	THR02123
#4	40	—	H3	T7R01163	T8R01163	THR01163	T7R02163	T8R02163	THR02163
#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



### 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
7/16	-	-	-	.3360	.3450	.3426	.3568	.3580	.3592	.3604	.3616
	-	-	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
1/2	-	-	28	.3990	.4070	.4051	.4193	.4205	.4217	.4229	.4241
	13	-	-	.4170	.4340	.4284	.4608	.4634	.4660	.4686	.4712
	-	20	-	.4460	.4570	.4537	.4745	.4762	.4779	.4796	.4813
9/16	-	-	28	.4610	.4700	.4676	.4818	.4830	.4842	.4854	.4866
	12	-	-	.4720	.4900	.4843	.5200	.5228	.5257	.5285	.5313
	-	18	-	.5020	.5150	.5106	.5342	.5361	.5379	.5398	.5417
5/8	-	-	24	.5170	.5270	.5244	.5413	.5427	.5441	.5455	.5469
	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
3/4	-	-	24	.5800	.5900	.5869	.6038	.6052	.6066	.6080	.6094
	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