



MORSE
CUTTING TOOLS

HPT HIGH PERFORMANCE TAPS

- Powder Metallurgy
High Speed Steel
- CNC Reduced Neck
Design
- Material Specific
Geometry



Performance

Tool Life

**Lower Cost per
Tapped Hole**

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NEW
Axial Coolant-Through for
Cast Iron & Cast Aluminum
PAGE 2

HPT HIGH PERFORMANCE TAPS



CNC Reduced Neck Design

MATERIAL SPECIFIC GEOMETRY

Application specific geometries engineered for high performance, high productivity tapping in a variety of materials. Morse Cutting Tools offers a complete selection of styles, sizes and "H" limits including metric sizes enabling you to choose the right tap to optimize your tapping application.

Powder metallurgy high speed steel, unique geometry, surface finish and tool coating ensure consistent, predictable performance, superior thread quality and excellent tool life for lower cost per tapped hole.

P/M POWDER METALLURGY HIGH SPEED STEEL

Premium Steel Engineered For

Hardness / Wear Resistance / Tool Life
Heat Resistance / Toughness and Strength
Performance Under Difficult Cutting Conditions
Higher Cutting Speeds / Increased Productivity

SURFACE FINISHES / TOOL COATINGS

Steam Oxide Finish increases wear resistance, reduces friction, loading and galling, helps retain cutting fluids, improves thread quality and extends tool life.

Steam Oxide Over Nitride Finish features a hard abrasion resistant **Nitrided Base** for enhanced tool life in abrasive materials including cast iron. **Steam Oxide** surface treatment helps toughen the nitrided base, reduces friction, loading and galling, helps retain cutting fluids, improves thread quality and extends tool life.

TiCN - Titanium Carbonitride Coating increases wear resistance, reduces friction and galling, reduces tapping torque, improves thread quality and allows increased cutting speeds for greatly increased productivity and tool life.

TiALN - Titanium Aluminum Nitride Coating is an excellent all-around coating that increases surface hardness, wear resistance, heat resistance, chip flow and resists chip welding. Especially recommended for abrasive and hard-to-machine materials that generate higher cutting temperatures.

CrN - Chromium Nitride Coating increases wear resistance, reduces friction and galling, reduces tapping torque, improves thread quality and allows increased cutting speeds for greatly increased productivity and tool life.

Recommended for softer materials including aluminum.

APPLICATIONS

FOR ALUMINUM

Spiral Point / Spiral Flute / Bright Finish / CrN (Chromium Nitride) Coated

Recommended for all types of aluminum alloys. CrN coating especially recommended for high-silicon aluminum alloys.

FOR CAST IRON

Straight Flute / Steam Oxide Over Nitride Finish

Recommended for all types of gray, ductile and malleable cast iron

FOR CAST IRON and CAST ALUMINUM

Straight Flute / **AXIAL COOLANT-THROUGH** / TiALN Coated

Recommended for Gray Cast Iron and Aluminum Alloy Castings.

FOR EXOTIC ALLOYS

Spiral Point / Spiral Flute / Steam Oxide Finish / TiCN Coated

Recommended for steels, steel alloys, stainless steels, titanium alloys, nickel and nickel base alloys, other exotic alloys and a wide variety of materials up to 32Rc hardness.

FOR HARD MATERIALS

Spiral Point / Spiral Flute / Steam Oxide Finish / TiCN Coated

Recommended for harder (32Rc- 45Rc) materials including steel alloys, titanium alloys, nickel base high temperature alloys, tool and mold steels and stainless steels

GEOMETRY

Spiral Point Taps are designed for efficient tapping of through holes and blind holes with adequate depth for chip accumulation at the bottom of the hole. The shearing action of the point provides freer cutting action and ejects the chips ahead of the tap, eliminating chip evacuation problems and chip damage to the threads. Shallower flutes also result in greater tap strength, allowing for higher cutting speeds.

Spiral Flute Taps are designed to lift the chips out of the hole in blind hole tapping, eliminating chip evacuation problems which can result in damaged threads and broken taps. They will also bridge openings, keyways and other interruptions in the tapped hole.

Plug Style (3-5 thread chamfer) is the most common chamfer used for tapping applications in through holes and blind holes with sufficient bottom clearance.

Semi-Bottoming Style (2-3 thread chamfer) allows threading close to the bottom of blind holes but cuts more efficiently than standard bottoming taps due to a slightly longer chamfer which distributes the cutting load over a greater number of teeth.

Semi-Interrupted Threads help to break the chips and enhance coolant flow to the cutting teeth for reduced chance of torn threads and improved thread quality.

CNC Reduced Neck Design enhances chip evacuation and cutting fluid flow to the cutting teeth for reduced friction, heat and galling. Also reduces contact between the tap and the workpiece.

Coolant-Through Straight Flute HPT High Performance Taps For Cast Iron and Cast Aluminum



List No. 2087 TIALN Coated

Semi-Bottoming Style

Recommended for Gray Cast Iron and Aluminum Alloy Castings

Powder Metallurgy High Speed Steel

TIALN - Titanium Aluminum Nitride Coating

AXIAL COOLANT-THROUGH

SIZE	THREAD TYPE	PITCH DIA. LIMIT	NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	EDP NO.
10-24	NC	H3	4	.50	.38	2.38	61290
10-24	NC	H5	4	.50	.38	2.38	61291
10-32	NF	H3	4	.50	.38	2.38	61292
1/4-20	NC	H3	4	.63	.38	2.50	61293
1/4-20	NC	H5	4	.63	.38	2.50	61294
1/4-28	NF	H3	4	.63	.38	2.50	61295
5/16-18	NC	H3	4	.69	.44	2.72	61296
5/16-18	NC	H5	4	.69	.44	2.72	61297
5/16-24	NF	H3	4	.69	.44	2.72	61298
3/8-16	NC	H3	4	.75	.50	2.94	61299
3/8-16	NC	H5	4	.75	.50	2.94	61300
3/8-24	NF	H3	4	.75	.50	2.94	61301
7/16-14	NC	H3	4	.88	*	3.16	61302
7/16-14	NC	H5	4	.88	*	3.16	61303
7/16-20	NF	H3	4	.88	*	3.16	61304
7/16-20	NF	H5	4	.88	*	3.16	61305
1/2-13	NC	H3	4	.94	*	3.38	61306
1/2-13	NC	H5	4	.94	*	3.38	61307
1/2-20	NF	H3	4	.94	*	3.38	61308
1/2-20	NF	H5	4	.94	*	3.38	61309
9/16-12	NC	H3	4	1.00	*	3.59	61310
9/16-12	NC	H5	4	1.00	*	3.59	61311
9/16-18	NF	H3	4	1.00	*	3.59	61312
9/16-18	NF	H5	4	1.00	*	3.59	61313
5/8-11	NC	H3	4	1.09	*	3.81	61314
5/8-11	NC	H5	4	1.09	*	3.81	61315
5/8-18	NF	H3	4	1.09	*	3.81	61316
5/8-18	NF	H5	4	1.09	*	3.81	61317
3/4-10	NC	H3	4	1.22	*	4.25	61318
3/4-10	NC	H5	4	1.22	*	4.25	61319
3/4-16	NF	H3	4	1.22	*	4.25	61320
3/4-16	NF	H5	4	1.22	*	4.25	61321

Metric

SIZE	THREAD TYPE	PITCH DIA. LIMIT	NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	EDP NO.
M5	0.8	D4	4	.50	.38	2.38	61325
M6	1.0	D5	4	.63	.38	2.50	61326
M8	1.25	D5	4	.69	.44	2.72	61327
M10	1.5	D6	4	.75	.50	2.94	61328
M12	1.25	D6	4	.94	*	3.38	61329
M12	1.75	D6	4	.94	*	3.38	61330
M14	1.25	D6	4	1.00	*	3.59	61331
M14	1.5	D6	4	1.00	*	3.59	61332
M16	1.5	D6	4	1.09	*	3.81	61333
M18	1.5	D6	4	1.09	*	4.03	61334

*Reduced Shank (shank diameter is smaller than minor diameter)

Cutting Speeds	Workpiece Material	Brinell Hardness (BHN)	Surface Speed (SFM)
	Aluminum Alloy Castings	—	40-95
	Gray Cast Iron	≤ 230	45-70

Straight Flute HPT High Performance Taps For Cast Iron



Semi-Bottoming Style

Recommended for most types of gray, ductile and malleable cast iron.

Premium Powder Metallurgy High Speed Steel
Steam Oxide over Nitride Finish



List No. 2094 Steam Oxide Over Nitride

CNC Reduced Neck Design

Size	TPI		No. of Flutes	Thread Length	Neck Length	OAL	Steam Oxide Over Nitride LIST NO. 2094			
	UNC	UNF					H2	H3	H4	H5
10	24	—	3	1/2	3/8	2-3/8	—	30140	—	—
10	—	32	3	1/2	3/8	2-3/8	30141	30142	—	—
1/4	20	—	4	5/8	3/8	2-1/2	—	30143	—	30144
1/4	—	28	4	5/8	3/8	2-1/2	—	30145	30146	—
5/16	18	—	4	11/16	7/16	2-23/32	—	30147	—	30148
5/16	—	24	4	11/16	7/16	2-23/32	—	30149	30150	—
3/8	16	—	4	3/4	1/2	2-15/16	—	30151	—	30152
3/8	—	24	4	3/4	1/2	2-15/16	—	30153	30154	—
7/16	14	—	4	7/8	9/16	3-5/32	—	30155	—	30156
7/16	—	20	4	7/8	9/16	3-5/32	—	30157	—	30158
1/2	13	—	4	15/16	23/32	3-3/8	—	30159	—	30160
1/2	—	20	4	15/16	23/32	3-3/8	—	30161	—	30162

Metric

Application Chart: Page 16

List No. 2094M Steam Oxide Over Nitride

Size	Pitch	Pitch Dia. Limit	No. of Flutes	Thread Length	Neck Length	OAL	Steam Oxide Over Nitride LIST NO. 2094M
M6	1.0	D5	4	5/8	3/8	2-1/2	30180
M8	1.0	D5	4	11/16	7/16	2-23/32	30181
M8	1.25	D5	4	11/16	7/16	2-23/32	30182
M10	1.5	D6	4	3/4	1/2	2-15/16	30183
M12	1.5	D5	4	15/16	23/32	3-3/8	30184
M12	1.75	D6	4	15/16	23/32	3-3/8	30185

Cutting Fluids Selection

Coolants and lubricants offer many benefits including reduced friction and heat, enhanced chip removal, improved accuracy and surface finish, higher speeds and feeds, corrosion protection and increased tool life. Proper selection and application of cutting fluids is critical to optimizing machining applications.

Please consult your cutting fluids supplier for advice on your specific machining application.

Spiral Point HPT High Performance Taps For Aluminum



Plug Style

Recommended for most types of aluminum alloys.

Premium Powder Metallurgy High Speed Steel
Bright Finish and CrN (Chromium Nitride) Coated
Semi-Interrupted Thread (3-Flute taps only)



List No. 2092 Bright Finish
List No. 2092S
CrN - Chromium Nitride Coated

Primarily designed for tapping through holes. The spiral point forces the chips ahead of the tap.

CNC Reduced Neck Design

Size	TPI		No. of Flutes	Thread Length	Neck Length	OAL	Bright Finish LIST NO. 2092					CrN Coated LIST NO. 2092S				
	UNC	UNF					H1	H2	H3	H4	H5	H1	H2	H3	H4	H5
4	40	—	2	5/16	1/4	1-7/8	—	30000	—	—	—	—	60700	—	—	—
4	—	48	2	5/16	1/4	1-7/8	30001	30002	—	—	—	60701	60702	—	—	—
5	40	—	2	5/16	5/16	1-15/16	—	30003	—	—	—	—	60703	—	—	—
6	32	—	2	3/8	5/16	2	—	30004	30005	—	—	—	60704	60705	—	—
6	—	40	2	3/8	5/16	2	—	30006	—	—	—	—	60706	—	—	—
8	32	—	3	3/8	3/8	2-1/8	—	30007	30008	—	—	—	60707	60708	—	—
8	—	36	3	3/8	3/8	2-1/8	—	30009	—	—	—	—	60709	—	—	—
10	24	—	3	1/2	3/8	2-3/8	—	—	30010	—	—	—	—	60710	—	—
10	—	32	3	1/2	3/8	2-3/8	—	30011	30012	—	—	—	60711	60712	—	—
1/4	20	—	3	5/8	3/8	2-1/2	—	—	30013	—	30014	—	—	60713	—	60714
1/4	—	28	3	5/8	3/8	2-1/2	—	—	30015	30016	—	—	—	60715	60716	—
5/16	18	—	3	11/16	7/16	2-23/32	—	—	30017	—	30018	—	—	60717	—	60718
5/16	—	24	3	11/16	7/16	2-23/32	—	—	30019	30020	—	—	—	60719	60720	—
3/8	16	—	3	3/4	1/2	2-15/16	—	—	30021	—	30022	—	—	60721	—	60722
3/8	—	24	3	3/4	1/2	2-15/16	—	—	30023	30024	—	—	—	60723	60724	—
7/16	14	—	3	7/8	9/16	3-5/32	—	—	30025	—	30026	—	—	60725	—	60726
7/16	—	20	3	7/8	9/16	3-5/32	—	—	30027	—	30028	—	—	60727	—	60728
1/2	13	—	3	15/16	23/32	3-3/8	—	—	30029	—	30030	—	—	60729	—	60730
1/2	—	20	3	15/16	23/32	3-3/8	—	—	30031	—	30032	—	—	60731	—	60732

Semi-Interrupted Thread on 3-Flute Taps Only

Metric

List No. 2092M Bright Finish

List No. 2092MS CrN - Chromium Nitride Coated



Size	Pitch	Pitch Dia. Limit	No. of Flutes	Thread Length	Neck Length	OAL	Bright Finish	
							LIST NO. 2092M	CrN Coated LIST NO. 2092MS
M3	0.5	D3	2	5/16	5/16	1-15/16	30050	60750
M4	0.7	D4	3	3/8	3/8	2-1/8	30051	60751
M5	0.8	D4	3	1/2	3/8	2-3/8	30052	60752
M6	1.0	D5	3	5/8	3/8	2-1/2	30053	60753
M8	1.0	D5	3	11/16	7/16	2-23/32	30054	60754
M8	1.25	D5	3	11/16	7/16	2-23/32	30055	60755
M10	1.5	D6	3	3/4	1/2	2-15/16	30056	60756
M12	1.5	D5	3	15/16	23/32	3-3/8	30057	60757
M12	1.75	D6	3	15/16	23/32	3-3/8	30058	60758

Semi-Interrupted Thread on 3-Flute Taps Only

Spiral Flute HPT High Performance Taps For Aluminum



Semi-Bottoming Style

Recommended for most types of aluminum alloys.

Premium Powder Metallurgy High Speed Steel
Bright Finish and CrN (Chromium Nitride) Coated
Semi-Interrupted Thread (3-Flute taps only).



List No. 2093 Bright Finish

List No. 2093S

CrN - Chromium Nitride Coated

Primarily designed for tapping blind holes. The spiral flutes draw the chips out of the hole.

CNC Reduced Neck Design

Size	TPI		No. of Flutes	Thread Length	Neck Length	OAL	Bright Finish LIST NO. 2093					CrN Coated LIST NO. 2093S				
	UNC	UNF					H1	H2	H3	H4	H5	H1	H2	H3	H4	H5
4	40	—	2	15/64	21/64	1-7/8	—	30070	—	—	—	—	60770	—	—	—
4	—	48	2	15/64	21/64	1-7/8	30071	30072	—	—	—	60771	60772	—	—	—
5	40	—	2	15/64	25/64	1-15/16	—	30073	—	—	—	—	60773	—	—	—
6	32	—	2	15/64	29/64	2	—	30074	30075	—	—	—	60774	60775	—	—
6	—	40	2	15/64	29/64	2	—	30076	—	—	—	—	60776	—	—	—
8	32	—	2	15/64	33/64	2-1/8	—	30077	30078	—	—	—	60777	60778	—	—
8	—	36	2	15/64	33/64	2-1/8	—	30079	—	—	—	—	60779	—	—	—
10	24	—	2	11/32	17/32	2-3/8	—	—	30080	—	—	—	—	60780	—	—
10	—	32	2	11/32	17/32	2-3/8	—	30081	30082	—	—	—	60781	60782	—	—
1/4	20	—	2	7/16	9/16	2-1/2	—	—	30083	—	30084	—	—	60783	—	60784
1/4	—	28	2	7/16	9/16	2-1/2	—	—	30085	30086	—	—	—	60785	60786	—
5/16	18	—	2	15/32	21/32	2-23/32	—	—	30087	—	30088	—	—	60787	—	60788
5/16	—	24	2	15/32	21/32	2-23/32	—	—	30089	30090	—	—	—	60789	60790	—
3/8	16	—	2	35/64	45/64	2-15/16	—	—	30091	—	30092	—	—	60791	—	60792
3/8	—	24	2	35/64	45/64	2-15/16	—	—	30093	30094	—	—	—	60793	60794	—
7/16	14	—	3	19/32	27/32	3-5/32	—	—	30095	—	30096	—	—	60795	—	60796
7/16	—	20	3	19/32	27/32	3-5/32	—	—	30097	—	30098	—	—	60797	—	60798
1/2	13	—	3	5/8	1-1/32	3-3/8	—	—	30099	—	30100	—	—	60799	—	60800
1/2	—	20	3	5/8	1-1/32	3-3/8	—	—	30101	—	30102	—	—	60801	—	60802

Semi-Interrupted Thread on 3-Flute Taps Only

Metric

Application Chart: Page 16

List No. 2093M Bright Finish

List No. 2093MS CrN - Chromium Nitride Coated

Size	Pitch	Pitch Dia. Limit	No. of Flutes	Thread Length	Neck Length	OAL	Bright Finish LIST NO. 2093M		CrN Coated LIST NO. 2093MS	
M3	0.5	D3	2	15/64	25/64	1-15/16	30120		60820	
M4	0.7	D4	2	15/64	33/64	2-1/8	30121		60821	
M5	0.8	D4	2	23/64	17/32	2-3/8	30122		60822	
M6	1.0	D5	2	7/16	9/16	2-1/2	30123		60823	
M8	1.0	D5	2	15/32	21/32	2-23/32	30124		60824	
M8	1.25	D5	2	15/32	21/32	2-23/32	30125		60825	
M10	1.5	D6	2	35/64	11/16	2-15/16	30126		60826	
M12	1.5	D5	3	5/8	1-1/64	3-3/8	30127		60827	
M12	1.75	D6	3	5/8	1-1/64	3-3/8	30128		60828	

Semi-Interrupted Thread on 3-Flute Taps Only

Spiral Point HPT High Performance Taps For Exotic Alloys



Plug Style

Recommended for steels, steel alloys, stainless steels, titanium alloys, nickel and nickel base alloys, other exotic alloys and a wide variety of materials up to 34Rc hardness.



Premium Powder Metallurgy High Speed Steel
Steam Oxide Finish and TiCN Coated

List No. 2095 Steam Oxide Finish

List No. 2095C

TiCN - Titanium Carbonitride Coated

Primarily designed for tapping through holes. The spiral point forces the chips ahead of the tap.

CNC Reduced Neck Design

Size	UNC	TPI	UNF	No. of Flutes	Thread Length	Neck Length	OAL	Steam Oxide Finish LIST NO. 2095				TiCN Coated LIST NO. 2095C			
								H2	H3	H4	H5	H2	H3	H4	H5
4	40	—	—	2	5/16	1/4	1-7/8	30200	—	—	—	60840	—	—	—
5	40	—	—	2	5/16	5/16	1-15/16	30201	—	—	—	60841	—	—	—
6	32	—	—	2	3/8	5/16	2	30202	30203	—	—	60842	60843	—	—
8	32	—	—	3	3/8	3/8	2-1/8	30204	30205	—	—	60844	60845	—	—
10	24	—	—	3	1/2	3/8	2-3/8	—	30206	—	—	—	60846	—	—
10	—	32	—	3	1/2	3/8	2-3/8	30208	30209	—	—	60848	60849	—	—
1/4	20	—	—	3	5/8	3/8	2-1/2	—	30210	—	30211	—	60850	—	60851
1/4	—	28	—	3	5/8	3/8	2-1/2	—	30212	30213	—	—	60852	60853	—
5/16	18	—	—	3	11/16	7/16	2-23/32	—	30214	—	30215	—	60854	—	60855
5/16	—	24	—	3	11/16	7/16	2-23/32	—	30216	30217	—	—	60856	60857	—
3/8	16	—	—	3	3/4	1/2	2-15/16	—	30218	—	30219	—	60858	—	60859
3/8	—	24	—	3	3/4	1/2	2-15/16	—	30220	30221	—	—	60860	60861	—
7/16	14	—	—	3	7/8	9/16	3-5/32	—	30222	—	30223	—	60862	—	60863
7/16	—	20	—	3	7/8	9/16	3-5/32	—	30224	—	30225	—	60864	—	60865
1/2	13	—	—	3	15/16	23/32	3-3/8	—	30226	—	30227	—	60866	—	60867
1/2	—	20	—	3	15/16	23/32	3-3/8	—	30228	—	30229	—	60868	—	60869
9/16	12	—	—	4	1	43/64	3-19/32	—	30230	—	30231	—	60870	—	60871
9/16	—	18	—	4	1	43/64	3-19/32	—	30232	—	30233	—	60872	—	60873
5/8	11	—	—	4	1-1/8	43/64	3-13/16	—	30234	—	30235	—	60874	—	60875
5/8	—	18	—	4	1-1/8	43/64	3-13/16	—	30236	—	30237	—	60876	—	60877
3/4	10	—	—	4	1-7/32	49/64	4-1/4	—	30238	—	30239	—	60878	—	60879
3/4	—	16	—	4	1-7/32	49/64	4-1/4	—	30240	—	30241	—	60880	—	60881

Metric

List No. 2095M Steam Oxide Finish

List No. 2095MC TiCN - Titanium Carbonitride Coated



Size	Pitch	Pitch Dia. Limit	No. of Flutes	Thread Length	Neck Length	OAL	Steam Oxide Finish	TiCN Coated
							LIST NO. 2095M	LIST NO. 2095MC
M3	0.5	D3	2	5/16	5/16	1-15/16	30260	60900
M4	0.7	D4	3	3/8	3/8	2-1/8	30261	60901
M5	0.8	D4	3	1/2	3/8	2-3/8	30262	60902
M6	1.0	D5	3	5/8	3/8	2-1/2	30263	60903
M8	1.0	D5	3	11/16	7/16	2-23/32	30264	60904
M8	1.25	D5	3	11/16	7/16	2-23/32	30265	60905
M10	1.5	D6	3	3/4	1/2	2-15/16	30266	60906
M12	1.5	D5	3	15/16	23/32	3-3/8	30267	60907
M12	1.75	D6	3	15/16	23/32	3-3/8	30268	60908

Spiral Flute HPT High Performance Taps For Exotic Alloys



Semi-Bottoming Style

Recommended for steels, steel alloys, stainless steels, titanium alloys, nickel and nickel base alloys, other exotic alloys and a wide variety of materials up to 34Rc hardness.



Premium Powder Metallurgy High Speed Steel
Steam Oxide Finish and TiCN Coated

List No. 2096 Steam Oxide Finish

List No. 2096C

TiCN - Titanium Carbonitride Coated

Primarily designed for tapping blind holes. The spiral flutes draw the chips out of the hole.

CNC Reduced Neck Design

Size	TPI		No. of Flutes	Thread Length	Neck Length	OAL	Steam Oxide Finish LIST NO. 2096				TiCN Coated LIST NO. 2096C			
	UNC	UNF					H2	H3	H4	H5	H2	H3	H4	H5
4	40	—	3	15/64	21/64	1-7/8	30280	—	—	—	60920	—	—	—
5	40	—	3	15/64	25/64	1-15/16	30281	—	—	—	60921	—	—	—
6	32	—	3	15/64	29/64	2	30282	30283	—	—	60922	60923	—	—
8	32	—	3	15/64	33/64	2-1/8	30284	30285	—	—	60924	60925	—	—
10	24	—	3	23/64	17/32	2-3/8	—	30286	—	—	—	60926	—	—
10	—	32	3	23/64	17/32	2-3/8	30288	30289	—	—	60928	60929	—	—
1/4	20	—	3	7/16	9/16	2-1/2	—	30290	—	30291	—	60930	—	60931
1/4	—	28	3	7/16	9/16	2-1/2	—	30292	30293	—	—	60932	60933	—
5/16	18	—	3	15/32	21/32	2-23/32	—	30294	—	30295	—	60934	—	60935
5/16	—	24	3	15/32	21/32	2-23/32	—	30296	30297	—	—	60936	60937	—
3/8	16	—	3	35/64	11/16	2-15/16	—	30298	—	30299	—	60938	—	60939
3/8	—	24	3	35/64	11/16	2-15/16	—	30300	30301	—	—	60940	60941	—
7/16	14	—	3	19/32	27/32	3-5/32	—	30302	—	30303	—	60942	—	60943
7/16	—	20	3	19/32	27/32	3-5/32	—	30304	—	30305	—	60944	—	60945
1/2	13	—	3	5/8	1-1/64	3-3/8	—	30306	—	30307	—	60946	—	60947
1/2	—	20	3	5/8	1-1/64	3-3/8	—	30308	—	30309	—	60948	—	60949
9/16	12	—	3	11/16	63/64	3-19/32	—	30310	—	30311	—	60950	—	60951
9/16	—	18	3	11/16	63/64	3-19/32	—	30312	—	30313	—	60952	—	60953
5/8	11	—	3	3/4	1-3/64	3-13/16	—	30314	—	30315	—	60954	—	60955
5/8	—	18	3	3/4	1-3/64	3-13/16	—	30316	—	30317	—	60956	—	60957
3/4	10	—	3	13/16	1-5/32	4-1/4	—	30318	—	30319	—	60958	—	60959
3/4	—	16	3	13/16	1-5/32	4-1/4	—	30320	—	30321	—	60960	—	60961

Metric



Application Chart: Page 16

List No. 2096M Steam Oxide Finish

List No. 2096MC TiCN - Titanium Carbonitride Coated

Size	Pitch	Pitch Dia. Limit	No. of Flutes	Thread Length	Neck Length	OAL	Steam Oxide Finish	
							LIST NO. 2096M	TiCN Coated LIST NO. 2096MC
M3	0.5	D3	3	15/64	25/64	1-15/16	30340	60980
M4	0.7	D4	3	15/64	33/64	2-1/8	30341	60981
M5	0.8	D4	3	23/64	17/32	2-3/8	30342	60982
M6	1.0	D5	3	7/16	9/16	2-1/2	30343	60983
M8	1.0	D5	3	15/32	21/32	2-23/32	30344	60984
M8	1.25	D5	3	15/32	21/32	2-23/32	30345	60985
M10	1.5	D6	3	35/64	11/16	2-15/16	30346	60986
M12	1.5	D5	3	5/8	1-1/64	3-3/8	30347	60987
M12	1.75	D6	3	5/8	1-1/64	3-3/8	30348	60988

Spiral Point - DIN Length HPT High Performance Taps



Plug Style
DIN Length — ANSI Shank

Recommended for steels, steel alloys, stainless steels, titanium alloys and a wide variety of materials up to 36Rc hardness.

Premium Powder Metallurgy High Speed Steel
Steam Oxide Finish and TiCN Coated

CNC Reduced Neck Design

DIN Length - longer than standard ANSI length - provides extra reach in tapping applications

ANSI Shank - made to standard American dimensions - fits standard tap holders



List No. 2088 Steam Oxide Finish

List No. 2088C

TiCN - Titanium Carbonitride Coated



Primarily designed for tapping through holes. The spiral point forces the chips ahead of the tap.

DIN Length

SIZE	TPI		NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	Steam Oxide Finish LIST NO. 2088				TiCN Coated LIST NO. 2088C			
	UNC	UNF					H2	H3	H4	H5	H2	H3	H4	H5
4	40	—	2	.433	.276	2.205	30530	—	—	—	61160	—	—	—
6	32	—	2	.472	.315	2.205	30532	30533	—	—	61162	61163	—	—
8	32	—	3	.512	.315	2.480	30534	30535	—	—	61164	61165	—	—
10	24	—	3	.591	.393	2.756	—	30536	—	—	—	61166	—	—
10	—	32	3	.512	.472	2.756	30537	30538	—	—	61167	61168	—	—
1/4	20	—	3	.669	.512	3.150	—	30539	—	30540	—	61169	—	61170
1/4	—	28	3	.669	.512	3.150	—	30541	30542	—	—	61171	61172	—
5/16	18	—	3	.787	.591	3.543	—	30543	—	30544	—	61173	—	61174
5/16	—	24	3	.669	.709	3.543	—	30545	30546	—	—	61175	61176	—
3/8	16	—	3	.866	.669	3.937	—	30547	—	30548	—	61177	—	61178
3/8	—	24	3	.709	.826	3.937	—	30549	30550	—	—	61179	61180	—
7/16	14	—	3	.866	*	3.937	—	30551	—	30552	—	61181	—	61182
7/16	—	20	3	.866	*	3.937	—	30553	—	30554	—	61183	—	61184
1/2	13	—	3	.984	*	4.331	—	30555	—	30556	—	61185	—	61186
1/2	—	20	3	.866	*	3.937	—	30557	—	30558	—	61187	—	61188
9/16	12	—	4	1.024	*	4.331	—	30559	—	30560	—	61189	—	61190
9/16	—	18	4	.866	*	3.937	—	30561	—	30562	—	61191	—	61192
5/8	11	—	4	1.063	*	4.331	—	30563	—	30564	—	61193	—	61194
5/8	—	18	4	.866	*	3.937	—	30565	—	30566	—	61195	—	61196
3/4	10	—	4	1.181	*	4.921	—	30567	—	30568	—	61197	—	61198
3/4	—	16	4	.984	*	4.331	—	30569	—	30570	—	61199	—	61200
7/8	9	—	4	1.126	*	5.512	—	—	30571	—	—	—	61201	—
7/8	—	14	4	1.024	*	4.921	—	—	30572	—	—	—	61202	—
1	8	—	4	1.417	*	6.299	—	—	30573	—	—	—	61203	—
1	—	12	4	1.102	*	5.512	—	—	30574	—	—	—	61204	—

Metric

SIZE	PITCH	PITCH DIA. LIMIT	NO. OF FLUTES	THREAD LENGTH MM	NECK LENGTH MM	OAL MM	Steam Oxide Finish List No. 2088M		TiCN Coated List No. 2088MC	
M4	0.7	D4	3	13	8	63	30576		61206	
M5	0.8	D4	3	15	10	70	30577		61207	
M6	1.0	D5	3	17	13	80	30578		61208	
M8	1.25	D5	3	20	15	90	30579		61209	
M10	1.5	D6	3	22	17	100	30580		61210	
M12	1.25	D5	3	22	*	100	30581		61211	
M12	1.5	D5	3	22	*	100	30582		61212	
M12	1.75	D6	3	24	*	110	30583		61213	
M14	1.5	D6	4	22	*	100	30584		61214	
M14	2	D7	4	26	*	110	30585		61215	
M16	2	D7	4	27	*	110	30586		61216	
M18	1.5	D6	4	25	*	110	30587		61217	
M20	2.5	D7	4	32	*	140	30588		61218	
M24	3	D8	4	34	*	160	30589		61219	

* Reduced Shank (shank diameter is smaller than minor pitch diameter)

Spiral Flute - DIN Length HPT High Performance Taps

Semi-Bottoming Style
DIN Length — ANSI Shank

Recommended for steels, steel alloys, stainless steels, titanium alloys and a wide variety of materials up to 36Rc hardness.

Premium Powder Metallurgy High Speed Steel
Steam Oxide Finish and TiCN Coated

CNC Reduced Neck Design

DIN Length - longer than standard ANSI length - provides extra reach in tapping applications

ANSI Shank - made to standard American dimensions - fits standard tap holders



List No. 2089 Steam Oxide Finish

List No. 2089C

TiCN - Titanium Carbonitride Coated

MADE IN THE
USA

DIN
Length

Primarily designed for tapping blind holes. The spiral flutes draw the chips out of the hole.

Application Chart: Page 16

SIZE	UNC	TPI	UNF	NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	Steam Oxide Finish LIST NO. 2089				TiCN Coated LIST NO. 2089C			
								H2	H3	H4	H5	H2	H3	H4	H5
4	40	—	—	3	.236	.473	2.205	30600	—	—	—	61230	—	—	—
6	32	—	—	3	.236	.551	2.205	30602	30603	—	—	61232	61233	—	—
8	32	—	—	3	.236	.591	2.480	30604	30605	—	—	61234	61235	—	—
10	24	—	—	3	.354	.630	2.756	—	30606	—	—	—	61236	—	—
10	—	32	—	3	.354	.630	2.756	30607	30608	—	—	61237	61238	—	—
1/4	20	—	—	3	.433	.748	3.150	—	30609	—	30610	—	61239	—	61240
1/4	—	28	—	3	.433	.748	3.150	—	30611	30612	—	—	61241	61242	—
5/16	18	—	—	3	.472	.906	3.543	—	30613	—	30614	—	61243	—	61244
5/16	—	24	—	3	.472	.906	3.543	—	30615	30616	—	—	61245	61246	—
3/8	16	—	—	3	.551	.984	3.937	—	30617	—	30618	—	61247	—	61248
3/8	—	24	—	3	.551	.984	3.937	—	30619	30620	—	—	61249	61250	—
7/16	14	—	—	3	.591	*	3.937	—	30621	—	30622	—	61251	—	61252
7/16	—	20	—	3	.591	*	3.937	—	30623	—	30624	—	61253	—	61254
1/2	13	—	—	3	.630	*	4.331	—	30625	—	30626	—	61255	—	61256
1/2	—	20	—	3	.630	*	3.937	—	30627	—	30628	—	61257	—	61258
9/16	12	—	—	3	.690	*	4.331	—	30629	—	30630	—	61259	—	61260
9/16	—	18	—	3	.690	*	3.937	—	30631	—	30632	—	61261	—	61262
5/8	11	—	—	3	.745	*	4.331	—	30633	—	30634	—	61263	—	61264
5/8	—	18	—	3	.745	*	3.937	—	30635	—	30636	—	61265	—	61266
3/4	10	—	—	3	.820	*	4.921	—	30637	—	30638	—	61267	—	61268
3/4	—	16	—	3	.820	*	4.331	—	30639	—	30640	—	61269	—	61270
7/8	9	—	—	4	.911	*	5.512	—	—	30641	—	—	—	61271	—
7/8	—	14	—	4	.911	*	4.921	—	—	30642	—	—	—	61272	—
1	8	—	—	4	1.025	*	6.299	—	—	30643	—	—	—	61273	—
1	—	12	—	4	1.025	*	5.512	—	—	30644	—	—	—	61274	—

Metric

SIZE	PITCH	PITCH DIA. LIMIT	NO. OF FLUTES	THREAD LENGTH MM	NECK LENGTH MM	OAL MM	Steam Oxide Finish List No. 2089M		TiCN Coated List No. 2089MC	
M4	0.7	D4	3	6	15	63	30646		61276	
M5	0.8	D4	3	9	16	70	30647		61277	
M6	1.0	D5	3	11	19	80	30648		61278	
M8	1.25	D5	3	12	23	90	30649		61279	
M10	1.5	D6	3	14	25	100	30650		61280	
M12	1.25	D5	3	16	*	100	30651		61281	
M12	1.5	D5	3	16	*	100	30652		61282	
M12	1.75	D6	3	16	*	110	30653		61283	
M14	1.5	D6	3	18	*	100	30654		61284	
M14	2	D7	3	18	*	110	30655		61285	
M16	2	D7	3	19	*	110	30656		61286	
M18	1.5	D6	3	21	*	110	30657		61287	
M20	2.5	D7	3	21	*	140	30658		61288	
M24	3	D8	4	26	*	160	30659		61289	

* Reduced Shank (shank diameter is smaller than minor pitch diameter)

Spiral Point HPT High Performance Taps For Hard Materials



Plug Style

Recommended for harder 32Rc-45Rc materials including steel alloys, titanium alloys, nickel base high temp alloys, tool and mold steels and stainless steels.



Premium Powder Metallurgy High Speed Steel Steam Oxide Finish and TiCN Coated

List No. 2097 Steam Oxide Finish

List No. 2097C

TiCN - Titanium Carbonitride Coated

Primarily designed for tapping through holes. The spiral point forces the chips ahead of the tap.

CNC Reduced Neck Design

Size	TPI		No. of Flutes	Thread Length	Neck Length	OAL	Steam Oxide Finish LIST NO. 2097				TiCN Coated LIST NO. 2097C			
	UNC	UNF					H2	H3	H4	H5	H2	H3	H4	H5
4	40	—	2	5/16	1/4	1-7/8	30360	—	—	—	61000	—	—	—
5	40	—	3	5/16	5/16	1-15/16	30361	—	—	—	61001	—	—	—
6	32	—	3	3/8	5/16	2	30362	30363	—	—	61002	61003	—	—
8	32	—	3	3/8	3/8	2-1/8	30364	30365	—	—	61004	61005	—	—
10	24	—	3	1/2	3/8	2-3/8	—	30366	—	—	—	61006	—	—
10	—	32	3	1/2	3/8	2-3/8	30368	30369	—	—	61008	61009	—	—
1/4	20	—	3	5/8	3/8	2-1/2	—	30370	—	30371	—	61010	—	61011
1/4	—	28	3	5/8	3/8	2-1/2	—	30372	30373	—	—	61012	61013	—
5/16	18	—	3	11/16	7/16	2-23/32	—	30374	—	30375	—	61014	—	61015
5/16	—	24	3	11/16	7/16	2-23/32	—	30376	30377	—	—	61016	61017	—
3/8	16	—	3	3/4	1/2	2-15/16	—	30378	—	30379	—	61018	—	61019
3/8	—	24	3	3/4	1/2	2-15/16	—	30380	30381	—	—	61020	61021	—
7/16	14	—	3	7/8	9/16	3-5/32	—	30382	—	30383	—	61022	—	61023
7/16	—	20	3	7/8	9/16	3-5/32	—	30384	—	30385	—	61024	—	61025
1/2	13	—	3	15/16	23/32	3-3/8	—	30386	—	30387	—	61026	—	61027
1/2	—	20	3	15/16	23/32	3-3/8	—	30388	—	30389	—	61028	—	61029
9/16	12	—	4	1	43/64	3-19/32	—	30390	—	30391	—	61030	—	61031
9/16	—	18	4	1	43/64	3-19/32	—	30392	—	30393	—	61032	—	61033
5/8	11	—	4	1-1/8	43/64	3-13/16	—	30394	—	30395	—	61034	—	61035
5/8	—	18	4	1-1/8	43/64	3-13/16	—	30396	—	30397	—	61036	—	61037
3/4	10	—	4	1-7/32	49/64	4-1/4	—	30398	—	30399	—	61038	—	61039
3/4	—	16	4	1-7/32	49/64	4-1/4	—	30400	—	30401	—	61040	—	61041

Metric

List No. 2097M Steam Oxide Finish

List No. 2097MC TiCN - Titanium Carbonitride Coated



Size	Pitch	Pitch Dia. Limit	No. of Flutes	Thread Length	Neck Length	OAL	Steam Oxide Finish LIST NO. 2097M		TiCN Coated LIST NO. 2097MC	
M3	0.5	D3	3	5/16	5/16	1-15/16	30420		61060	
M4	0.7	D4	3	3/8	3/8	2-1/8	30421		61061	
M5	0.8	D4	3	1/2	3/8	2-3/8	30422		61062	
M6	1.0	D5	3	5/8	3/8	2-1/2	30423		61063	
M8	1.0	D5	3	11/16	7/16	2-23/32	30424		61064	
M8	1.25	D5	3	11/16	7/16	2-23/32	30425		61065	
M10	1.5	D6	3	3/4	1/2	2-15/16	30426		61066	
M12	1.5	D5	3	15/16	23/32	3-3/8	30427		61067	
M12	1.75	D6	3	15/16	23/32	3-3/8	30428		61068	

Spiral Flute HPT High Performance Taps For Hard Materials



Semi-Bottoming Style

Recommended for harder 32Rc-45Rc materials including steel alloys, titanium alloys, nickel base high temp alloys, tool and mold steels and stainless steels.



Premium Powder Metallurgy High Speed Steel
Steam Oxide Finish and TiCN Coated

List No. 2098 Steam Oxide Finish

List No. 2098C

TiCN - Titanium Carbonitride Coated

Primarily designed for tapping blind holes. The spiral flutes draw the chips out of the hole.

CNC Reduced Neck Design

Size	TPI		No. of Flutes	Thread Length	Neck Length	OAL	Steam Oxide Finish LIST NO. 2098				TiCN Coated LIST NO. 2098C			
	UNC	UNF					H2	H3	H4	H5	H2	H3	H4	H5
4	40	—	2	5/16	1/4	1-7/8	30440	—	—	—	61080	—	—	—
5	40	—	2	5/16	5/16	1-15/16	30441	—	—	—	61081	—	—	—
6	32	—	2	3/8	5/16	2	30442	30443	—	—	61082	61083	—	—
8	32	—	2	3/8	3/8	2-1/8	30444	30445	—	—	61084	61085	—	—
10	24	—	3	1/2	3/8	2-3/8	—	30446	—	—	—	61086	—	—
10	—	32	3	1/2	3/8	2-3/8	30448	30449	—	—	61088	61089	—	—
1/4	20	—	3	5/8	3/8	2-1/2	—	30450	—	30451	—	61090	—	61091
1/4	—	28	3	5/8	3/8	2-1/2	—	30452	30453	—	—	61092	61093	—
5/16	18	—	3	11/16	7/16	2-23/32	—	30454	—	30455	—	61094	—	61095
5/16	—	24	3	11/16	7/16	2-23/32	—	30456	30457	—	—	61096	61097	—
3/8	16	—	3	3/4	1/2	2-15/16	—	30458	—	30459	—	61098	—	61099
3/8	—	24	3	3/4	1/2	2-15/16	—	30460	30461	—	—	61100	61101	—
7/16	14	—	3	7/8	9/16	3-5/32	—	30462	—	30463	—	61102	—	61103
7/16	—	20	3	7/8	9/16	3-5/32	—	30464	—	30465	—	61104	—	61105
1/2	13	—	3	15/16	23/32	3-3/8	—	30466	—	30467	—	61106	—	61107
1/2	—	20	3	15/16	23/32	3-3/8	—	30468	—	30469	—	61108	—	61109
9/16	12	—	4	1	43/64	3-19/32	—	30470	—	30471	—	61110	—	61111
9/16	—	18	4	1	43/64	3-19/32	—	30472	—	30473	—	61112	—	61113
5/8	11	—	4	1-1/8	43/64	3-13/16	—	30474	—	30475	—	61114	—	61115
5/8	—	18	4	1-1/8	43/64	3-13/16	—	30476	—	30477	—	61116	—	61117
3/4	10	—	4	1-7/32	49/64	4-1/4	—	30478	—	30479	—	61118	—	61119
3/4	—	16	4	1-7/32	49/64	4-1/4	—	30480	—	30481	—	61120	—	61121

Metric



Application Chart: Page 16

List No. 2098M Steam Oxide Finish

List No. 2098MC TiCN - Titanium Carbonitride Coated

Size	Pitch	Pitch Dia. Limit	No. of Flutes	Thread Length	Neck Length	OAL	Steam Oxide Finish	TiCN Coated
							LIST NO. 2098M	LIST NO. 2098MC
M3	0.5	D3	2	5/16	5/16	1-15/16	30490	61140
M4	0.7	D4	2	3/8	3/8	2-1/8	30491	61141
M5	0.8	D4	3	1/2	3/8	2-3/8	30492	61142
M6	1.0	D5	3	5/8	3/8	2-1/2	30493	61143
M8	1.0	D5	3	11/16	7/16	2-23/32	30494	61144
M8	1.25	D5	3	11/16	7/16	2-23/32	30495	61145
M10	1.5	D6	3	3/4	1/2	2-15/16	30496	61146
M12	1.5	D5	3	15/16	23/32	3-3/8	30497	61147
M12	1.75	D6	3	15/16	23/32	3-3/8	30498	61148

Thread Forming — DIN Length HPT High Performance Taps



DIN Length, ANSI Shank

Thread Forming taps cold form rather than cut the threads. Advantages include no chips to dispose of, stronger higher quality threads, increased tapping speeds, longer tap life and reduced tap breakage.

Lube Grooves provide a path for lubrication and act as vents to relieve pressure in blind hole tapping.

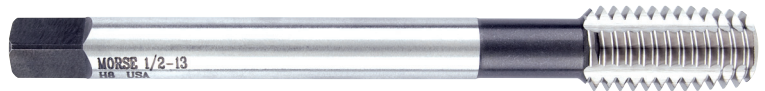
Plug Style (4 threads tapered) for through holes and blind holes with adequate depth. The longer taper chamfer is easier starting, requires less torque, produces less burr above the mouth of the tapped hole and increases tool life.

Bottoming Style (2 threads tapered) for blind holes.

CNC Reduced Neck Design

DIN Length – longer than standard ANSI length – provides extra reach in tapping applications

ANSI Shank – made to standard American dimensions – fits standard tap holders



- List No. 2106 Bright Finish
- List No. 2106G TiN Coated
- List No. 2106C TiCN Coated
- List No. 2106T TiALN Coated

DIN Length

Powder Metallurgy High Speed Steel for enhanced performance and increased tool life under difficult tapping conditions.

Recommended for a wide variety of ductile materials up to 28Rc hardness.

NOTE: Thread forming taps **require a larger tap drill size** than cutting taps because the material flows during the thread forming process. It may be necessary to experiment to determine the required hole size to produce a specific percent of thread. **Countersinking before tapping** is recommended because the forming process usually displaces material above the mouth of the tapped hole.

Application Chart: Page 16



Machine Screw — Plug Style

SIZE	TPI		PITCH DIA. LIMIT	THREAD LENGTH	NECK LENGTH	OAL	NO. OF LUBE GROOVES	BRIGHT	TIN COATED	TICN COATED	TiALN COATED
	UNC	UNF									
4	40	—	H3	.433	.276	2.205	3	30670	94680	61460	61620
	40	—	H5	.433	.276	2.205	3	30671	94681	61461	61621
6	32	—	H3	.472	.315	2.205	3	30672	94682	61462	61622
	32	—	H5	.472	.315	2.205	3	30673	94683	61463	61623
8	32	—	H3	.512	.315	2.480	3	30674	94684	61464	61624
	32	—	H5	.512	.315	2.480	3	30675	94685	61465	61625
10	24	—	H4	.591	.393	2.756	4	30676	94686	61466	61626
	24	—	H6	.591	.393	2.756	4	30677	94687	61467	61627
	—	32	H4	.512	.472	2.756	4	30678	94688	61468	61628
	—	32	H6	.512	.472	2.756	4	30679	94689	61469	61629

Titanium Nitride (TiN) Coating results in an extremely hard surface with high lubricity for increased tool life, improved thread quality, reduced torque and increased tapping speeds for greater productivity.

Titanium Carbonitride (TiCN) Coating is harder than TiN coating for more abrasive materials, but has a lower temperature resistance.

Titanium Aluminum Nitride (TiALN) Coating is especially recommended for applications generating higher temperatures.

Thread Forming HPT High Performance Taps

Machine Screw — Bottoming Style

DIN
Length

SIZE	TPI		PITCH DIA. LIMIT	THREAD LENGTH	NECK LENGTH	OAL	NO. OF LUBE GROOVES	BRIGHT	TIN COATED	TICN COATED	TiAlN COATED
	UNC	UNF									
4	40	—	H3	.433	.276	2.205	3	30750	94760	61540	61700
	40	—	H5	.433	.276	2.205	3	30751	94761	61541	61701
6	32	—	H3	.472	.315	2.205	3	30752	94762	61542	61702
	32	—	H5	.472	.315	2.205	3	30753	94763	61543	61703
8	32	—	H3	.512	.315	2.480	3	30754	94764	61544	61704
	32	—	H5	.512	.315	2.480	3	30755	94765	61545	61705
10	24	—	H4	.591	.393	2.756	4	30756	94766	61546	61706
	24	—	H6	.591	.393	2.756	4	30757	94767	61547	61707
	—	32	H4	.512	.472	2.756	4	30758	94768	61548	61708
	—	32	H6	.512	.472	2.756	4	30759	94769	61549	61709



Fractional — Plug Style

Application Chart: Page 16

SIZE	TPI		PITCH DIA. LIMIT	THREAD LENGTH	NECK LENGTH	OAL	NO. OF LUBE GROOVES	BRIGHT	TIN COATED	TICN COATED	TiAlN COATED
	UNC	UNF									
1/4	20	—	H4	.669	.512	3.150	4	30690	94700	61480	61640
	20	—	H6	.669	.512	3.150	4	30691	94701	61481	61641
	—	28	H4	.669	.512	3.150	4	30692	94702	61482	61642
	—	28	H6	.669	.512	3.150	4	30693	94703	61483	61643
5/16	18	—	H5	.787	.591	3.543	4	30694	94704	61484	61644
	18	—	H7	.787	.591	3.543	4	30695	94705	61485	61645
	—	24	H5	.669	.591	3.543	4	30696	94706	61486	61646
	—	24	H7	.669	.591	3.543	4	30697	94707	61487	61647
3/8	16	—	H5	.866	.669	3.937	4	30698	94708	61488	61648
	16	—	H7	.866	.669	3.937	4	30699	94709	61489	61649
	—	24	H5	.709	.826	3.937	4	30700	94710	61490	61650
	—	24	H7	.709	.826	3.937	4	30701	94711	61491	61651
7/16	14	—	H5	.866	*	3.937	4	30702	94712	61492	61652
	14	—	H8	.866	*	3.937	4	30703	94713	61493	61653
	—	20	H5	.866	*	3.937	4	30704	94714	61494	61654
	—	20	H8	.866	*	3.937	4	30705	94715	61495	61655
1/2	13	—	H5	.984	*	4.331	4	30706	94716	61496	61656
	13	—	H8	.984	*	4.331	4	30707	94717	61497	61657
	—	20	H5	.866	*	3.937	4	30708	94718	61498	61658
	—	20	H8	.866	*	3.937	4	30709	94719	61499	61659
5/8	11	—	H7	1.063	*	4.331	6	30710	94720	61500	61660
	11	—	H10	1.063	*	4.331	6	30711	94721	61501	61661
	—	18	H7	.866	*	3.937	6	30712	94722	61502	61662
	—	18	H10	.866	*	3.937	6	30713	94723	61503	61663
3/4	10	—	H7	1.181	*	4.921	6	30714	94724	61504	61664
	10	—	H10	1.181	*	4.921	6	30715	94725	61505	61665
	—	16	H7	.984	*	4.331	6	30716	94726	61506	61666
	—	16	H10	.984	*	4.331	6	30717	94727	61507	61667

* Reduced Shank (shank diameter is smaller than minor pitch diameter)

Thread Forming HPT High Performance Taps



Fractional — Bottoming Style

SIZE	TPI		PITCH DIA. LIMIT	THREAD LENGTH	NECK LENGTH	OAL	NO. OF LUBE GROOVES	BRIGHT	TIN COATED	TICN COATED	TiAlN COATED
	UNC	UNF									
1/4	20	—	H4	.669	.512	3.150	4	30770	94780	61560	61720
	20	—	H6	.669	.512	3.150	4	30771	94781	61561	61721
	—	28	H4	.669	.512	3.150	4	30772	94782	61562	61722
	—	28	H6	.669	.512	3.150	4	30773	94783	61563	61723
5/16	18	—	H5	.787	.591	3.543	4	30774	94784	61564	61724
	18	—	H7	.787	.591	3.543	4	30775	94785	61565	61725
	—	24	H5	.669	.591	3.543	4	30776	94786	61566	61726
	—	24	H7	.669	.591	3.543	4	30777	94787	61567	61727
3/8	16	—	H5	.866	.669	3.937	4	30778	94788	61568	61728
	16	—	H7	.866	.669	3.937	4	30779	94789	61569	61729
	—	24	H5	.709	.826	3.937	4	30780	94790	61570	61730
	—	24	H7	.709	.826	3.937	4	30781	94791	61571	61731
7/16	14	—	H5	.866	*	3.937	4	30782	94792	61572	61732
	14	—	H8	.866	*	3.937	4	30783	94793	61573	61733
	—	20	H5	.866	*	3.937	4	30784	94794	61574	61734
	—	20	H8	.866	*	3.937	4	30785	94795	61575	61735
1/2	13	—	H5	.984	*	4.331	4	30786	94796	61576	61736
	13	—	H8	.984	*	4.331	4	30787	94797	61577	61737
	—	20	H5	.866	*	3.937	4	30788	94798	61578	61738
	—	20	H8	.866	*	3.937	4	30789	94799	61579	61739
5/8	11	—	H7	1.063	*	4.331	6	30790	94800	61580	61740
	11	—	H10	1.063	*	4.331	6	30791	94801	61581	61741
	—	18	H7	.866	*	3.937	6	30792	94802	61582	61742
	—	18	H10	.866	*	3.937	6	30793	94803	61583	61743
3/4	10	—	H7	1.181	*	4.921	6	30794	94804	61584	61744
	10	—	H10	1.181	*	4.921	6	30795	94805	61585	61745
	—	16	H7	.984	*	4.331	6	30796	94806	61586	61746
	—	16	H10	.984	*	4.331	6	30797	94807	61587	61747

MADE IN THE
USA

DIN
Length

Metric — Plug Style

SIZE	PITCH	PITCH DIA. LIMIT	THREAD LENGTH MM	NECK LENGTH MM	OAL MM	NO. OF LUBE GROOVES	BRIGHT	TIN COATED	TICN COATED	TiAlN COATED
M5	0.8	D7	15	10	70	4	30731	94741	61521	61681
M6	1	D8	17	13	80	4	30732	94742	61522	61682
M8	1.25	D9	20	15	90	4	30733	94743	61523	61683
M10	1.5	D10	22	17	100	4	30734	94744	61524	61684
M12	1.75	D11	24	*	110	4	30735	94745	61525	61685
M14	2	D11	26	*	110	6	30736	94746	61526	61686
M16	2	D12	27	*	110	6	30737	94747	61527	61687
M20	2.5	D12	32	*	140	6	30738	94748	61528	61688

Metric — Bottoming Style

SIZE	PITCH	PITCH DIA. LIMIT	THREAD LENGTH MM	NECK LENGTH MM	OAL MM	NO. OF LUBE GROOVES	BRIGHT	TIN COATED	TICN COATED	TiAlN COATED
M5	0.8	D7	15	10	70	4	30811	94821	61601	61761
M6	1	D8	17	13	80	4	30812	94822	61602	61762
M8	1.25	D9	20	15	90	4	30813	94823	61603	61763
M10	1.5	D10	22	17	100	4	30814	94824	61604	61764
M12	1.75	D11	24	*	110	4	30815	94825	61605	61765
M14	2	D11	26	*	110	6	30816	94826	61606	61766
M16	2	D12	27	*	110	6	30817	94827	61607	61767
M20	2.5	D12	32	*	140	6	30818	94828	61608	61768

* Reduced Shank (shank diameter is smaller than minor pitch diameter)

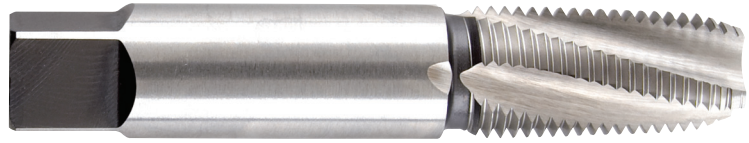
Spiral Flute HPT High Performance Taper Pipe Taps



Recommended for low to medium carbon steels, alloy steels, tool steels, stainless steels, titanium alloys and many other materials up to 35Rc hardness.

Premium Powder Metallurgy high speed steel for increased toughness, wear resistance and heat resistance in a wide range of materials up to 35Rc hardness. **Enhanced Geometry** especially recommended for tapping **Stainless Steel**.

Steam Oxide Surface Treatment increases wear resistance, reduces friction, acts as a lubricant, reduces galling and chip welding, improves chip flow and increases tap lubricant retention. **NOT RECOMMENDED FOR NON-FERROUS MATERIALS.**



List No. 2099

Premium Powder Metallurgy High Speed Steel
Bright Finish and Steam Oxide Finish
15° Helix Angle
2 - 3-1/2 Thread Chamfer

Optional Tool Coatings available to optimize specific tapping applications

Extra Length – longer than standard ANSI length – provides extra reach in tapping applications

ANSI Shank – made to standard American dimensions – fits standard tap holders

**EXTRA
Length**

For 1/8" Taps:
Small Shank = .3125" dia.
Large Shank = .4375" dia.

NPT/ANPT Taper Pipe Thread

NPT taper pipe taps are commonly used for tapping pipe fittings and couplings. Assembly requires the use of a thread sealant to ensure a tight seal.

Application Chart: Page 16

SIZE	THREAD LENGTH	OAL	NO. OF FLUTES	BRIGHT	SURFACE TREATED
1/16-27	1 1/16	2-9/16	4	36220	36230
1/8-27* (Sm. Sk.)	3/4	2-3/4	4	36221	36231
1/8-27* (Lg. Sk.)	3/4	2-3/4	4	36222	36232
1/4-18	1-1/16	3	4	36223	36233
3/8-18	1-1/16	3-1/8	4	36224	36234
1/2-14	1-3/8	3-15/16	4	36225	36235
3/4-14	1-3/8	4-1/8	5	36226	36236
1-11-1/2	1-3/4	4-1/2	5	36227	36237

*Large shank furnished unless otherwise specified.



NPTF Dryseal Taper Pipe Thread

NPTF **Dryseal** taper pipe taps produce threads where a tight seal is achieved during assembly by metal-to-metal contact. Used for applications requiring a tight seal without the use of thread sealants.

Optional Tool Coatings available to optimize specific tapping applications

SIZE	THREAD LENGTH	OAL	NO. OF FLUTES	BRIGHT	SURFACE TREATED
1/16-27	1 1/16	2-9/16	4	36240	36250
1/8-27* (Sm. Sk.)	3/4	2-3/4	4	36241	36251
1/8-27* (Lg. Sk.)	3/4	2-3/4	4	36242	36252
1/4-18	1-1/16	3	4	36243	36253
3/8-18	1-1/16	3-1/8	4	36244	36254
1/2-14	1-3/8	3-15/16	4	36245	36255
3/4-14	1-3/8	4-1/8	5	36246	36256
1-11-1/2	1-3/4	4-1/2	5	36247	36257

*Large shank furnished unless otherwise specified.

Application Chart for HPT High Performance Taps

	WORKPIECE MATERIAL	EXAMPLES	HARDNESS		RECOMMENDED TAP			
			BRN	HRc	CUTTING TAP			FORMING TAP
					SPEED (SFM)	THROUGH HOLE (Use Spiral Point Where Available)	BLIND HOLE (Use Spiral Flute Where Available)	SPEED (SFM)
Steel	Low Carbon (Less Than 0.3% C)	1008, 1118, 12L14, 1213, 1513, A36	< 200	<15	25 - 50	-	-	50 - 100
	Medium Carbon (0.3% - 0.6% C)	1030, 1040, 1045, 1050,	< 275	< 28	15 - 40	DIN Length or Exotic	Din Length or Exotic	30 - 80
	High Carbon, Alloyed (More than 0.6% C)	1070, 1080, 1561, 1572	< 300	< 32	15 - 30	DIN Length or Exotic	Din Length or Exotic	-
	Hardened	4140, Hard 1340, 50100	275 - 320	28 - 34	12- 25	Exotic	Exotic	-
320 - 420			34 - 45	5 - 15	Hard Material	Hard Material	-	
Stainless Steel	Free Machining	303,410, 416, 440F	<275	< 28	25 - 40	DIN Length or Exotic	DIN Length or Exotic	50 - 80
	Austenitic	200 Series, 300 Series	< 275	< 28	15 - 35	DIN Length or Exotic	Exotic or DIN Length	30 - 70
		Nitronic 32, 40, 50, 60	350-425	38 - 45	5 - 10	Hard Material	Hard Material	-
	Martensitic & Ferritic	400 Series: 416 Se, 420F, 420FSe; 440F, 440FSe	< 275	< 28	20 - 35	DIN Length or Exotics	DIN Length or Exotics	40 - 70
Hardened	15-5 PH, 17-4 PH, A-236, AM-350	275 - 320	28 - 34	5-15	Exotic	Exotic	-	
		320 - 425	34 - 45	5 - 15	Hard Material	Hard Material	-	
Tool Steel	Hot Work, Cold Work, Mold	A2, D2, H11, P2, P4	275 - 320	28 - 34	7 - 20	DIN Length or Exotic	DIN Length or Exotic	-
			320 - 420	34 - 45	3 - 10	Hard Material	Hard Material	-
Cast Iron	Grey, Pearlitic, Ferritic	ASTM A48 Class 20; 25; 30; 40; 50; SAIJ 431C Grade G1800; 3000; 4000	<260	<26	35 - 60	Cast Iron or Hard Material	Cast Iron or Hard Material	-
	Ductile, Pearlitic, Ferritic	ASTM A536 GRADES 60-40-18; 65-45-12; 80-55-06	<260	<26	20 - 40	Cast Iron or Hard Material	Cast Iron or Hard Material	-
	Malleable	ASTM A47 Grades 32510; 35018, ASTM A 220; Grades 40010; 45006; 60004; 70003; 80002	<260	<26	10 - 30	Cast Iron or Hard Material	Cast Iron or Hard Material	-
Titanium Alloys	Commercially Pure	99.5, 99.2, 98.9, Ti- 0.2 Pd, Ti code - 12	< 275	< 28	25 - 45	Exotic	Exotic	50 - 90
	Alpha and Beta Alloys Annealed	Ti-5Al-2.55 Sn, Ti-6Al-4V	275 - 320	28 - 34	10 - 25	Exotic or DIN Length	Exotic or DIN Length	-
	Alpha and Beta Alloys Solution Treated and Aged	Ti-6Al-4V ELI, Ti-6Al-6V-2 Sn	320 - 420	34 - 45	2 - 8	Hard Material	Hard Material	-
Nickel Alloys	Nickel and Nickel Base Alloys Wrought and Cast	Nickel 200, Monel Alloy 400, Duranickel Alloy 301	170 - 250	< 25	10 - 25	Exotic	Exotic	-
	Nickel Base High Temperature Alloys Wrought and Cast	Inconel 718, Nimonic 90, Rene 41, Hastelloy B and C, Inconel 600	250 - 320	28 - 34	6 - 12	Exotic	Exotic	-
320 - 420			34 - 45	3 - 10	Hard Material	Hard Material	-	
Aluminum Alloys	Unalloyed	1000 Series	-	-	40 - 80	Aluminum	Aluminum	80 - 160
	Wrought	2000, 3000, 5000, 6000, 7000 Series	-	-	70 - 100	Aluminum	Aluminum	140 - 200
	Cast	360, A380	-	-	60 - 90	Aluminum	Aluminum	120 - 180

SPEEDS in Surface Feet per Minute (SFM) are suggested starting points and may be increased or decreased depending on actual material and machining conditions.

SPEEDS may be increased for coated taps, reduced percentage of full threads, fine pitch taps, and spiral point taps.

SPEEDS may need to be decreased for coarse pitch taps, higher percentages of full thread, and spiral flute taps.

PIPE TAPS should be run at one half to three quarters of the speed for taps of comparable pitch and diameter.

NOTE: Information in this chart is for reference only. We will not be held liable for any consequential damages or economic loss due to the use of information contained within this chart.



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Certificate Issue Date: 07-MAY-2015
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Carl Blazik,
Director, Technical
Operations & Business Units,
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