

PM SERIES

Optimum taps recommended for high hardness materials such as thermal refined and mold steels from 25 to 45HRC!

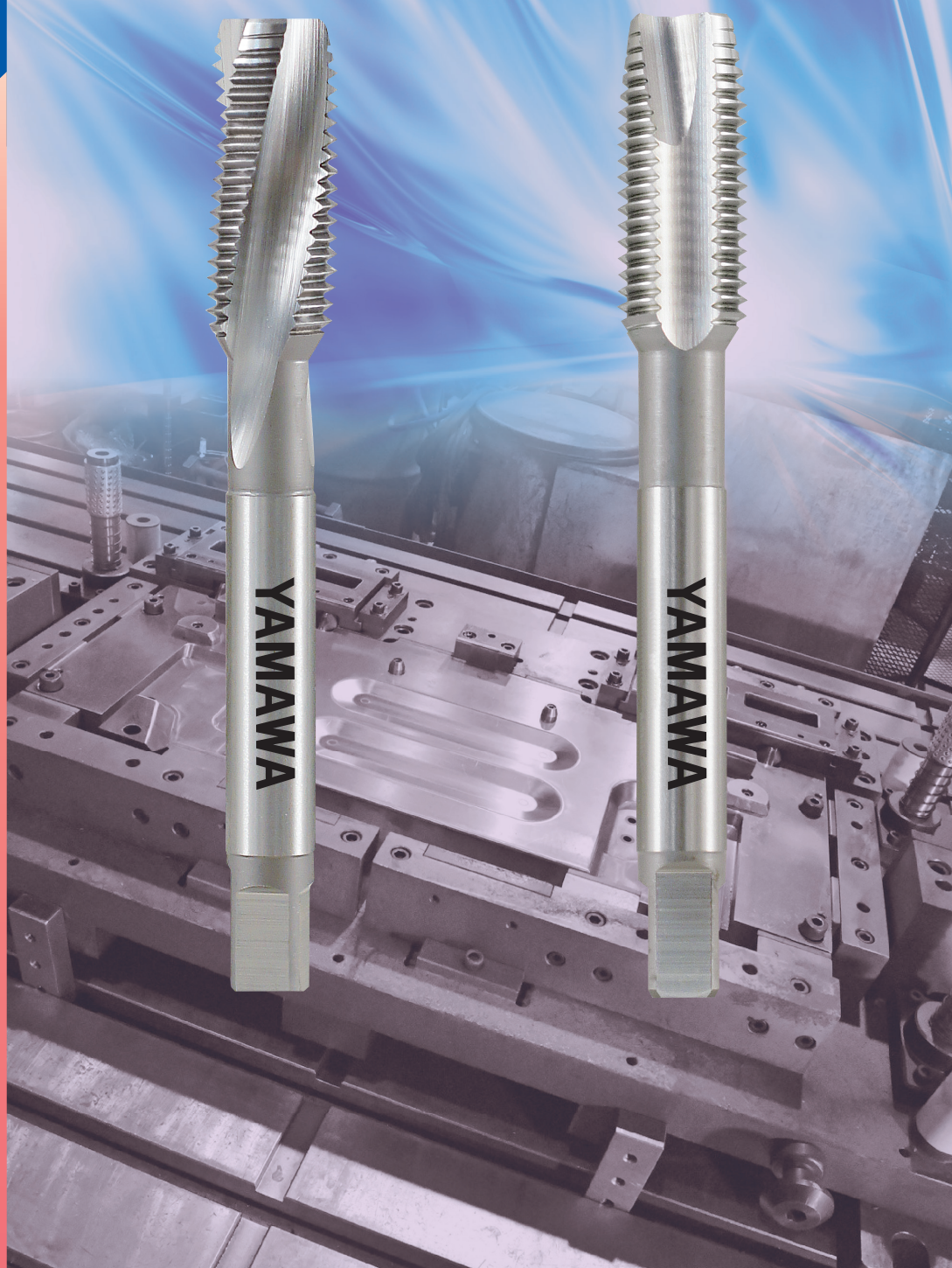
▪ PM Series ▪

PM-SP

PM-PO

ANSI

For North American Market



Spiral Fluted Taps for Hard-to-Machine Materials

PM-SP**HSS-P**High carbon steels
15~30
(sfm)Thermal refined steels
~15
(sfm)Thermal refined steels
~15
(sfm)

25~35HRC

35~45HRC

Spiral Pointed Taps for Hard-to-Machine Materials

PM-PO**HSS-P**High carbon steels
15~30
(sfm)Thermal refined steels
15~30
(sfm)Thermal refined steels
~15
(sfm)

25~35HRC

35~45HRC

■ Features

- PM series are ideal tap for machining hardened steels with a hardness of 25 to 45 HRC, such as forged products made from high carbon steels, alloy steels, thermal refined steels, and mold steels.
- The thread portion of the tap is designed for high hardness materials and HSS-P has excellent wear resistance.

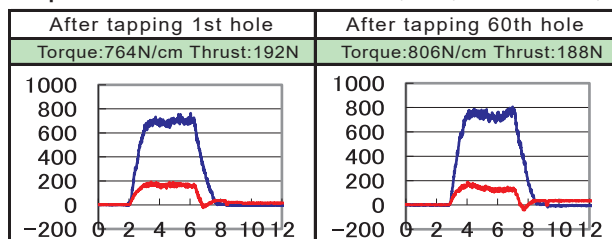
PM-SP/PM-PO**Recommended Tapping Speed**

Workpiece Material	PM-SP	PM-PO
Thermal Refined Steels 35~45HRC	Up to 15sfm	Up to 15sfm
Thermal Refined Steels 25~35HRC	Up to 15sfm	15~30sfm
High Carbon steels	15~30sfm	15~30sfm

Tapping Data

Tapping Condition PM-PO P3 3/8-16UNC

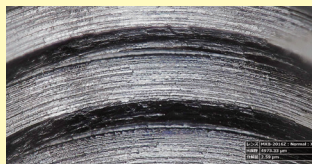
Workpiece Material	4140 40HRC
Tapping Length	0.394 inch
Tapping Speed	15sfm
Machine	Vertical Machining Center
Tapping Fluid	Non-water Soluble Cutting Oil

Torque and Thrust Chart — Torque(N/cm) — Thrust(N)

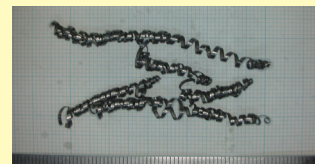
Both torque and thrust are still stable after tapping 60 holes.

Cutting edges after tapping 60 holes.

Even after tapping 60 holes, the wear on the cutting edges is minimal which results in longer tool life.

Excellent surface finish.

Even after tapping 60 holes, there were no torn threads or welding on the internal thread surface. The thread accuracy is also still satisfactory.

Good chip ejection

Chips are ejected forward in a finely curled shape from the initial to 60-hole machining. This results in a stable machining process.

Tapping record for PM series taps

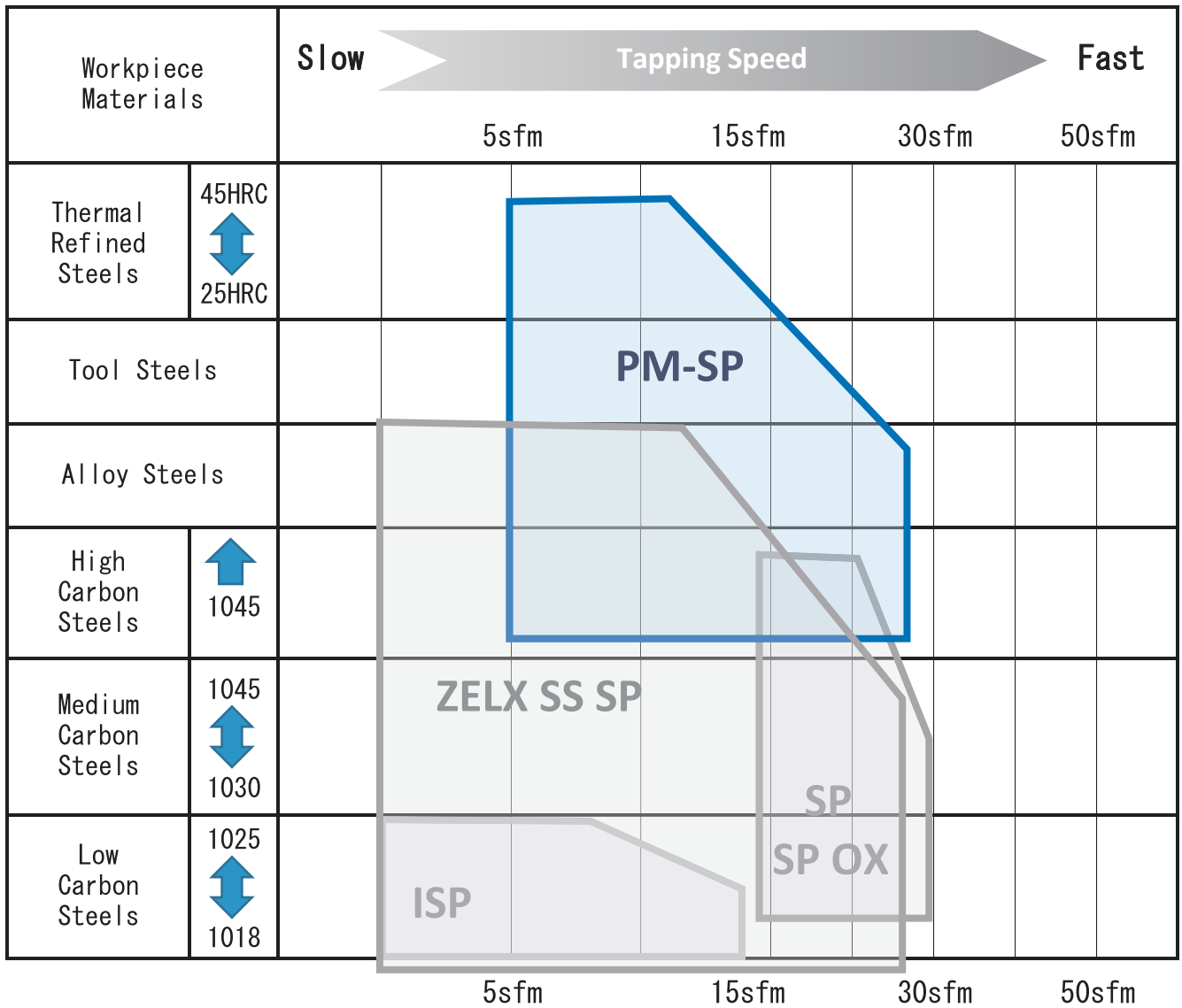
Product Symbol	Size	Workpiece Material	Hardness (HRC)	Bored Hole Size (mm)	Tapping Length (mm) *	Tapping Machine	Tapping Speed (m/min)	Feed System	Tapping Fluid	Tool Life (Holes)	Result
PM-SP	M4X0.7	S50C	45	3.4	10 (2.5D)	M/C	5	Synchronized	Water soluble	200	Conventional products broke or chipped after 120 holes, but the PM-SP can tap 200 holes, allowing for continuous tapping.
PM-SP	M4X0.7	Thermal Refined Steels	37	3.4	10 (2.5D)	M/C	3	Synchronized	Water soluble	440	Conventional products had a life of 400 holes, but the PM-SP can tap 440 holes.
PM-SP	M6X1	SCM440	34	5.1	15 (2.5D)	M/C	3	Synchronized	Water soluble	250	Conventional products (TiN coated spiral fluted taps) had a life of about 150 holes, but the PM-SP can tap 250 holes.
PM-SP	M8X1.25	Thermal Refined Steels	39	6.8	10 (1.3D)	M/C	3	Synchronized	Non-water soluble	160	The life of the conventional product was about 110 holes, but the PM-SP can tap 160 holes.
PM-SP	M10X1.5	NAK80	38	8.5	13 (1.3D)	M/C	4	Synchronized	Non-water soluble	350	The life of conventional products is 200 holes, but the PM-SP can tap 350 holes.
PM-SP	M10X1.5	NAK80	40	8.5	15 (1.5D)	Special Machine	3	Synchronized	Non-water soluble	100	Stable tapping is now possible without sudden chipping troubles.
PM-SP	M16X1.5	FCD450	—	14.5	25 (1.6D)	M/C	10	Synchronized	Water soluble	1,200	The ability to machine 1,200 holes without any problems has made continuous machining possible.
PM-SP	M20X2.5	SCM440	30	17.6	40 (2D)	M/C	5	Non-synchronous	Water soluble	120	Stable tapping is now possible without sudden chipping troubles.
PM-PO	M6X1	HARDOX	45	5.1	8 (1.3D)	5-face machining center	6	Non-synchronous	Water soluble	50	Constant exchange through stable tapping.
PM-PO	M6X1	Thermal Refined Steels	32	5.0	6 (1D)	M/C	6	Non-synchronous	Non-water soluble	1,500	Conventional products have a life of 1,200 holes, but the PM-PO can tap 1,500 holes.

* (D) shows the tapping length as a ratio of tap diameter.



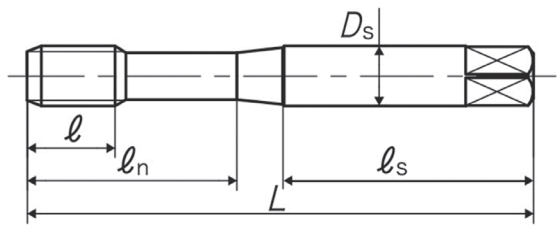
Recommended tapping range

System table of taps for blind hole use

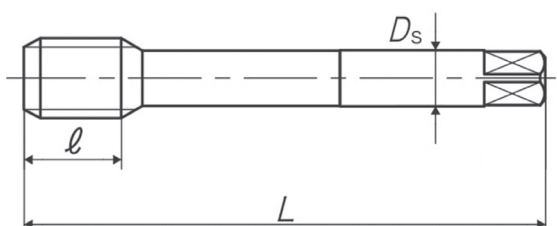


Shape and Dimensions

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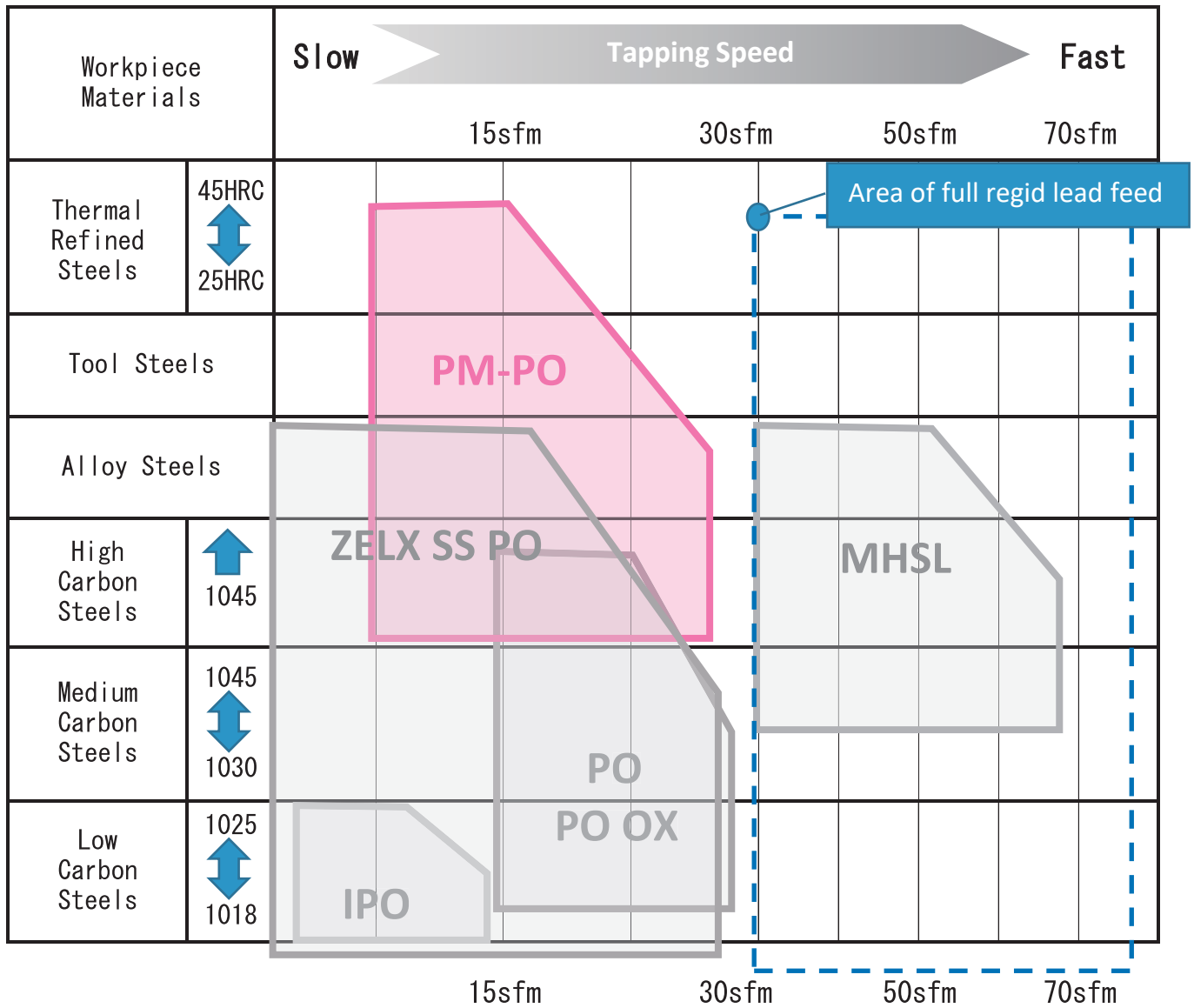


Size	Class	Code	Chamfer	L (inch)	l (inch)	ln (inch)	Ds (inch)	No. of flutes	TYPE	Recommended Bored Hole Size (inch)
5/16-18UNC	GH4	SAU05O4DPB	2.75P	2.718	#N/A	1.125	0.318	3	1	Φ 0.262
5/16-24UNF	GH4	SAU05M4DPB	2.75P	2.718	0.669	1.125	0.318	3	1	Φ 0.275
3/8-16UNC	GH4	SAU06P4DPB	2.75P	2.937	0.748	1.25	0.381	3	1	Φ 0.318
3/8-24UNF	GH4	SAU06M4DPB	2.75P	2.937	0.748	1.25	0.381	3	1	Φ 0.338
7/16-14UNC	GH6	SAU07Q6DPB	2.75P	3.156	0.866	—	0.323	3	2	Φ 0.372
7/16-20UNF	GH4	SAU07N4DPB	2.75P	3.156	0.866	—	0.323	3	2	Φ 0.392
1/2-13UNC	GH6	SAU08R6DPB	2.75P	3.375	0.984	—	0.367	3	2	Φ 0.43
1/2-20UNF	GH4	SAU08N4DPB	2.75P	3.375	0.984	—	0.367	3	2	Φ 0.454
5/8-11UNC	GH6	SAU10U6DPB	2.75P	3.812	1.083	—	0.48	3	2	Φ 0.541
5/8-18UNF	GH4	SAU10O4DPB	2.75P	3.812	1.083	—	0.48	3	2	Φ 0.575
3/4-10UNC	GH6	SAU12V6DPB	2.75P	4.25	1.201	—	0.59	3	2	Φ 0.658
3/4-16UNF	GH6	SAU12P6DPB	2.75P	4.25	1.201	—	0.59	3	2	Φ 0.693
1 -8UNC	GH7	SAU16X7DPB	2.75P	5.125	1.496	—	0.8	3	2	Φ 0.884
1 -12UNF	GH6	SAU16S6DPB	2.75P	5.125	1.496	—	0.8	3	2	Φ 0.924



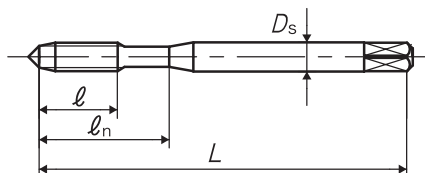
Recommended tapping range

System table of taps for through hole use

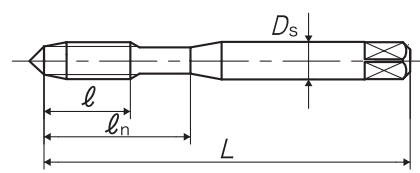


Shape and Dimensions

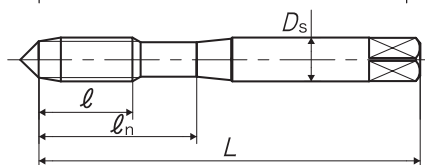
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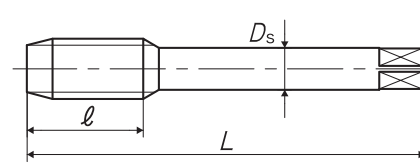
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Size	Class	Code	Chamfer	L (inch)	l (inch)	ln (inch)	Ds (inch)	No. of flutes	TYPE	Recommended Bored Hole Size (inch)
No.6-32UNC	GH3	PAUN6J3DPB	5.5P	2	0.413	0.687	0.141	2	1	Φ 0.112
No.6-40UNF	GH3	PAUN6H3DPB	5.5P	2	0.413	0.687	0.141	2	1	Φ 0.117
No.8-32UNC	GH3	PAUN8J3DPB	5.5P	2.125	0.453	0.75	0.168	2	1	Φ 0.137
No.8-36UNF	GH3	PAUN8I3DPB	5.5P	2.125	0.453	0.75	0.168	2	1	Φ 0.14
No.10-24UNC	GH3	PAUNAM3DPB	5.5P	2.375	0.531	0.875	0.194	2	1	Φ 0.153
No.10-32UNF	GH3	PAUNAJ3DPB	5.5P	2.375	0.531	0.875	0.194	2	1	Φ 0.162
No.12-24UNC	GH3	PAUNCM3DPB	5.5P	2.375	0.571	0.937	0.22	2	1	Φ 0.179
No.12-28UNF	GH3	PAUNCK3DPB	5.5P	2.375	0.571	0.937	0.22	2	1	Φ 0.184
1/4-20UNC	GH4	PAU04N4DPB	5.5P	2.5	0.591	1	0.255	3	2	Φ 0.204
1/4-28UNF	GH4	PAU04K4DPB	5.5P	2.5	0.591	1	0.255	3	2	Φ 0.218
5/16-18UNC	GH5	PAU05O5DPB	5.5P	2.718	0.669	1.125	0.318	3	3	Φ 0.262
5/16-24UNF	GH5	PAU05M5DPB	5.5P	2.718	0.669	1.125	0.318	3	3	Φ 0.275
3/8-16UNC	GH6	PAU06P6DPB	5.5P	2.937	0.748	1.25	0.381	3	3	Φ 0.318
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1/2-13UNC	GH6	PAU08R6DPB	5.5P	3.375	0.984	—	0.367	3	4	Φ 0.43
1/2-20UNF	GH6	PAU08N6DPB	5.5P	3.375	0.984	—	0.367	3	4	Φ 0.454
9/16-12UNC	GH6	PAU09S6DPB	5.5P	3.593	0.984	—	0.429	3	4	Φ 0.486
9/16-18UNF	GH6	PAU09O6DPB	5.5P	3.593	0.984	—	0.429	3	4	Φ 0.512
5/8-11UNC	GH7	PAU10U7DPB	5.5P	3.812	1.083	—	0.48	3	4	Φ 0.541
5/8-18UNF	GH6	PAU10O6DPB	5.5P	3.812	1.083	—	0.48	3	4	Φ 0.575
3/4-10UNC	GH7	PAU12V7DPB	5.5P	4.25	1.201	—	0.59	3	4	Φ 0.658
3/4-16UNF	GH6	PAU12P6DPB	5.5P	4.25	1.201	—	0.59	3	4	Φ 0.693
7/8-9UNC	GH7	PAU14W7DPB	5.5P	4.687	1.339	—	0.697	3	4	Φ 0.772
7/8-14UNF	GH6	PAU14Q6DPB	5.5P	4.687	1.339	—	0.697	3	4	Φ 0.809
1 -8UNC	GH8	PAU16X8DPB	5.5P	5.125	1.496	—	0.8	3	4	Φ 0.884
1 -12UNF	GH7	PAU16S7DPB	5.5P	5.125	1.496	—	0.8	3	4	Φ 0.924

Warning

- ◆Tools may shatter during use. Wear safety eye cover or eye glasses to avoid injury during tapping.
- ◆Use tools under the proper tapping condition.
- ◆Never wear gloves during turning operations as the gloves may get caught in the tools.
- ◆Wear safety shoes to avoid foot injury by the falling tools.
- ◆When attaching tools to the machine, fasten firmly to avoid chatter and run-out.
- ◆Fasten the workpiece firmly so it never moves during the tapping operation. Never use worn tools or damaged tools.
- ◆Take a special care to prevent fire during machining. High temperature during tapping can cause a fire.

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