

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**
JIS

**Unified threads are
now available !**



Spiral Fluted Taps for Hard-to-Machine Materials

PM-SP



HSS-P



High carbon steels
5~10
(m/min)

Thermal refined steels
~5
(m/min)
25~35HRC

Thermal refined steels
~5
(m/min)
35~45HRC

Spiral Pointed Taps for Hard-to-Machine Materials

PM-PO



HSS-P



High carbon steels
5~10
(m/min)

Thermal refined steels
5~10
(m/min)
25~35HRC

Thermal refined steels
~5
(m/min)
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

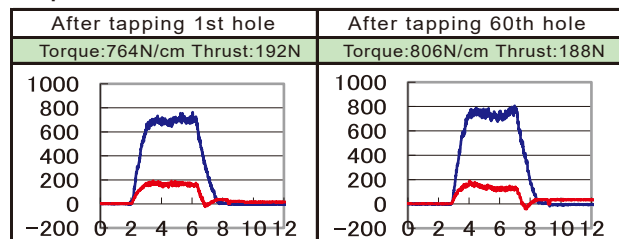
Workpiece material	PM-SP	PM-PO
Thermal Refined Steels 35~45HRC	~5m/min	~5/min
Thermal Refined Steels 25~35HRC	~5m/min	5~10m/min
High Carbon Steels	5~10m/min	5~10m/min

Tapping Data

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

Workpiece Material	SCM440 40HRC
Tapping Length	10mm
Tapping Speed	5m/min
Machine	Vertical Machining Center
Tapping Fluid	Non-water soluble cutting oil

Torque and Thrust Chart



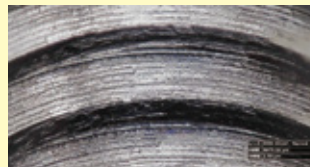
Both torque and thrust are still stable after tapping 60 holes.

Cutting edges after tapping 60 holes.



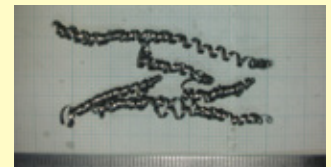
Even after tapping 60 holes, the wear on the cutting edges is minimal which results in longer tool life.

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



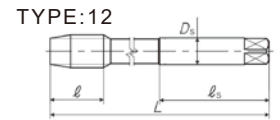
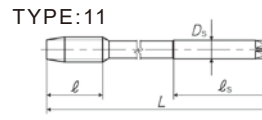
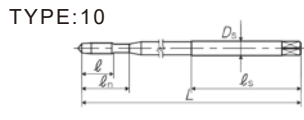
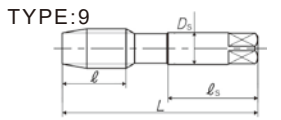
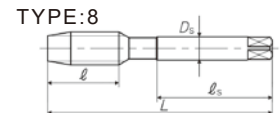
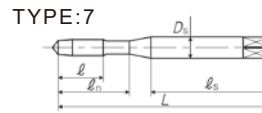
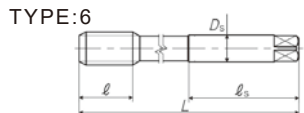
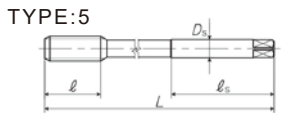
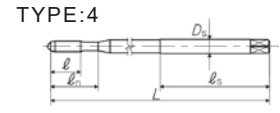
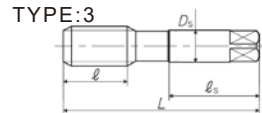
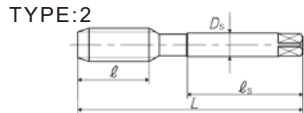
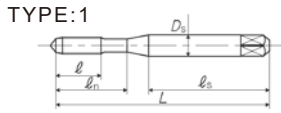
Chips are ejected forward in a finely curled shape from the initial to 60-hole machining. This results in a stable machining process.

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.

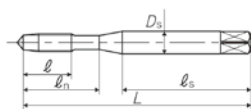
Shape and Dimensions



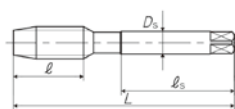
Size	L (mm)	l (mm)	l _n (mm)	l _s (mm)	D _s (mm)	PM-SP					PM-PO					MSRP(JPY)	Bored hole size (Ref.) (mm)
						Class	Code	Chamfer	No. of flutes	Type	Class	Code	Chamfer	No. of flutes	Type		
For Metric Threads																	
M3 X 0.5	46	9	14	26	4	P3	SY3.0GRDPB	2.75P	3	1	P3	PY3.0GRDPB	5.5P	3	7	1,770	2.56
M4 X 0.7	52	11	17	29	5	P3	SY4.0IRDPB	2.75P	3	1	P3	PY4.0IRDPB	5.5P	3	7	1,770	3.38
M5 X 0.8	60	13	22	33	5.5	P3	SY5.0KRDPB	2.75P	3	1	P3	PY5.0KRDPB	5.5P	3	7	1,780	4.28
M6 X 1	62	15	26	33	6	P3	SY6.0MRDPB	2.75P	3	1	P3	PY6.0MRDPB	5.5P	3	7	1,960	5.09
M8 X 1.25	70	19	—	36	6.2	P3	SY8.0NRDPB	2.75P	3	2	P4	PY8.0NSDPB	5.5P	3	8	2,690	6.85
M10 X 1.5	75	23	—	38	7	P3	SY010ORDPB	2.75P	3	2	P4	PY010OSDPB	5.5P	3	8	3,420	8.60
M10 X 1.25	75	23	—	38	7	P3	SY010NRDPB	2.75P	3	2	P4	PY010NSDPB	5.5P	3	8	3,420	8.85
M12 X 1.75	82	26	—	42	8.5	P3	SY012PRDPB	2.75P	3	2	P4	PY012PSDPB	5.5P	3	8	4,850	10.4
M12 X 1.5	82	26	—	42	8.5	P3	SY012NSDPB	2.75P	3	2	P4	PY012NSDPB	5.5P	3	8	4,850	10.60
M12 X 1.25	82	26	—	42	8.5	P4	SY012ORDPB	2.75P	3	2	P4	PY012OSDPB	5.5P	3	8	4,850	10.85
M14 X 2	88	26	—	45	10.5	P4	SY014QSDPB	2.75P	3	2	P5	PY014QTDPB	5.5P	3	8	6,610	12.1
M14 X 1.5	88	26	—	45	10.5	P3	SY014ORDPB	2.75P	3	2	P4	PY014OSDPB	5.5P	3	8	6,610	12.6
M16 X 2	95	26	—	48	12.5	P4	SY016QSDPB	2.75P	3	2	P5	PY016QTDPB	5.5P	3	8	8,840	14.1
M16 X 1.5	95	26	—	48	12.5	P3	SY016ORDPB	2.75P	3	2	P4	PY016OSDPB	5.5P	3	8	8,840	14.6
M18 X 2.5	100	33	—	51	14	P4	SY018RSDPB	2.75P	4	2	P5	PY018RTDPB	5.5P	3	8	11,900	15.6
M18 X 1.5	100	33	—	51	14	P4	SY018OSDPB	2.75P	4	2	P4	PY018OSDPB	5.5P	3	8	11,900	16.6
M20 X 2.5	105	33	—	50	15	P4	SY020RSDPB	2.75P	4	3	P5	PY020RTDPB	5.5P	3	9	16,100	17.6
M20 X 1.5	105	33	—	50	15	P4	SY020OSDPB	2.75P	4	3	P4	PY020OSDPB	5.5P	3	9	16,100	18.6
M22 X 2.5	115	33	—	55	17	P4	SY022RSDPB	2.75P	4	3	P5	PY022RTDPB	5.5P	3	9	20,600	19.6
M22 X 1.5	115	33	—	55	17	P4	SY022OSDPB	2.75P	4	3	P4	PY022OSDPB	5.5P	3	9	20,600	20.6
M24 X 3	120	39	—	55	19	P4	SY024SSDPB	2.75P	4	3	P5	PY024STDPB	5.5P	3	9	25,700	21.1
M24 X 1.5	120	39	—	55	19	P4	SY024OSDPB	2.75P	4	3	P4	PY024OSDPB	5.5P	3	9	25,700	22.6
M27 X 3	130	39	—	60	20	P4	SY027SSDPB	2.75P	4	3	P5	PY027STDPB	5.5P	4	9	35,700	24.1
M27 X 1.5	130	39	—	60	20	P4	SY027OSDPB	2.75P	4	3	P4	PY027OSDPB	5.5P	4	9	35,700	25.6
M30 X 3.5	135	46	—	62	23	P4	SY030TSDPB	2.75P	4	3	P5	PY030TTDPB	5.5P	4	9	45,500	26.6
M30 X 1.5	135	46	—	62	23	P4	SY030OSDPB	2.75P	4	3	P4	PY030OSDPB	5.5P	4	9	45,500	28.6
For Long Shank Metric Threads																	
M3 X 0.5	100	9	14	40	4	P3	S43.0GRDPBE	2.75P	3	4	P3	P43.0GRDPBE	5.5P	3	10	5,060	2.56
M4 X 0.7	100	11	17	40	5	P3	S44.0IRDPBE	2.75P	3	4	P3	P44.0IRDPBE	5.5P	3	10	4,620	3.38
M5 X 0.8	100	13	22	40	5.5	P3	S45.0KRDPBE	2.75P	3	4	P3	P45.0KRDPBE	5.5P	3	10	4,050	4.28
M6 X 1	100	15	26	40	6	P3	S46.0MRDPBE	2.75P	3	4	P3	P46.0MRDPBE	5.5P	3	10	3,460	5.09
M6 X 1	150	15	26	40	6	P3	S46.0MRDPBG	2.75P	3	4	P3	P46.0MRDPBG	5.5P	3	10	6,110	5.09
M8 X 1.25	100	19	—	50	6.2	P3	SY8.0NRDPBE	2.75P	3	5	P4	PY8.0NSDPBE	5.5P	3	11	4,400	6.85
M8 X 1.25	150	19	—	50	6.2	P3	SY8.0NRDPBG	2.75P	3	5	P4	PY8.0NSDPBG	5.5P	3	11	7,490	6.85
M10 X 1.5	150	23	—	50	7	P3	SY010ORDPBG	2.75P	3	5	P4	PY010OSDPBG	5.5P	3	11	8,710	8.60
M10X1.25	150	23	—	50	7	P3	SY010NRDPBG	2.75P	3	5	P4	PY010NSDPBG	5.5P	3	11	8,710	8.85
M12 X 1.75	150	26	—	50	8.5	P3	SY012PRDPBG	2.75P	3	5	P4	PY012PSDPBG	5.5P	3	11	11,000	10.4
M12 X 1.5	150	26	—	50	8.5	P3	SY012ORDPBG	2.75P	3	5	P4	PY012OSDPBG	5.5P	3	11	11,000	10.60
M12X1.25	150	26	—	50	8.5	P4	SY012NSDPBG	2.75P	3	5	P4	PY012NSDPBG	5.5P	3	11	11,000	10.85
M14 X 2	150	26	—	60	10.5	P4	SY014QSDPBG	2.75P	3	5	P5	PY014QTDPBG	5.5P	3	11	13,700	12.1
M14 X 1.5	150	26	—	60	10.5	P3	SY014ORDPBG	2.75P	3	5	P4	PY014OSDPBG	5.5P	3	11	13,700	12.6
M16 X 2	150	26	—	60	12.5	P4	SY016QSDPBG	2.75P	3	5	P5	PY016QTDPBG	5.5P	3	11	14,900	14.1
M16 X 1.5	150	26	—	60	12.5	P3	SY016ORDPBG	2.75P	3	5	P4	PY016OSDPBG	5.5P	3	11	14,900	14.6
M18 X 2.5	150	33	—	70	14	P4	SY018RSDPBG	2.75P	4	5	P5	PY018RTDPBG	5.5P	3	11	20,300	15.6
M18 X 1.5	150	33	—	70	14	P4	SY018OSDPBG	2.75P	4	5	P4	PY018OSDPBG	5.5P	3	11	20,300	16.6
M20 X 2.5	150	33	—	70	15	P4	SY020RSDPBG	2.75P	4	6	P5	PY018RTDPBG	5.5P	3	12	26,100	17.6
M20 X 1.5	150	33	—	70	15	P4	SY020OSDPBG	2.75P	4	6	P4	PY018OSDPBG	5.5P	3	12	26,100	18.6
M22 X 2.5	200	33	—	70	17	P4	SY022RSDPBG	2.75P	4	6	P5	PY020RTDPBG	5.5P	3	12	36,000	19.6
M22 X 1.5	200	33	—	70	17	P4	SY022OSDPBK	2.75P	4	6	P4	PY020OSDPBG	5.5P	3	12	36,000	20.6
M24 X 3	200	39	—	80	19	P4	SY024SSDPBK	2.75P	4	6	P5	PY024STDPBK	5.5P	3	12	40,500	21.1
M24 X 1.5	200	39	—	80	19	P4	SY024OSDPBK	2.75P	4	6	P4	PY024OSDPBK	5.5P	3	12	40,500	22.6
M27 X 3	200	39	—	80	20	P4	SY027SSDPBK	2.75P	4	6	P5	PY027STDPBK	5.5P	4	12	45,000	24.1
M27 X 1.5	200	39	—	80	20	P4	SY027OSDPBK	2.75P	4	6	P4	PY027OSDPBK	5.5P	4	12	45,000	25.6
M30 X 3.5	200	46	—	80	23	P4	SY030TSDPBK	2.75P	4	6	P5	PY030TTDPBK	5.5P	4	12	57,700	26.6
M30 X 1.5	200	46	—	80	23	P4	SY030OSDPBK	2.75P	4	6	P4	PY030OSDPBK	5.5P	4	12	57,700	28.6

Shape and Dimensions

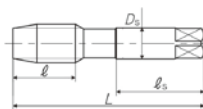
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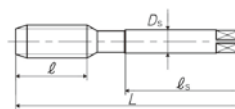
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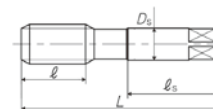
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TYPE:4



TYPE:5



Size	L (mm)	l (mm)	l _n (mm)	l _s (mm)	D _s (mm)	PM-SP					PM-PO					MSRP(JPY)	Bored hole size (Ref.) (mm)
						Class	Code	Chamfer	No. of flutes	Type	Class	Code	Chamfer	No. of flutes	Type		
NEW!! For Unified Threads																	
No.6-32UNC	52	11	17	27	5	-	-	-	-	-	P2	PYUN6JQDPB	5.5P	2	1	2,080	2.83
No.6-40UNF	52	11	17	27	5	-	-	-	-	-	P2	PYUN6HQDPB	5.5P	2	1	2,080	2.97
No.8-32UNC	60	13	22	32	5.5	-	-	-	-	-	P2	PYUN8JQDPB	5.5P	2	1	2,090	3.47
No.8-36UNF	60	13	22	32	5.5	-	-	-	-	-	P2	PYUN8IQDPB	5.5P	2	1	2,090	3.56
No.10-24UNC	60	13	22	32	5.5	-	-	-	-	-	P2	PYUNAMQDPB	5.5P	2	1	2,090	3.89
No.10-32UNF	60	13	22	32	5.5	-	-	-	-	-	P2	PYUNAQQDPB	5.5P	2	1	2,090	4.11
No.12-24UNC	62	15	26	33	6	-	-	-	-	-	P2	PYUNCMQDPB	5.5P	2	1	2,240	4.53
No.12-28UNF	62	15	26	33	6	-	-	-	-	-	P2	PYUNCKQDPB	5.5P	2	1	2,240	4.67
1/4-20UNC	62	15	26	33	6	-	-	-	-	-	P3	PYU04NRDPB	5.5P	3	1	2,240	5.19
1/4-28UNF	62	15	26	33	6	-	-	-	-	-	P3	PYU04KRDPB	5.5P	3	1	2,240	5.53
5/16-18UNC	70	19	-	36	6.2	P3	SYU05ORDPB	2.75P	3	4	P3	PYU05ORDPB	5.5P	3	2	3,040	6.65
5/16-24UNF	70	19	-	36	6.2	P3	SYU05MRDPB	2.75P	3	4	P3	PYU05MRDPB	5.5P	3	2	3,040	6.97
3/8-16UNC	75	23	-	38	7	P3	SYU06PRDPB	2.75P	3	4	P4	PYU06PSDPB	5.5P	3	2	3,970	8.06
3/8-24UNF	75	23	-	38	7	P3	SYU06MRDPB	2.75P	3	4	P3	PYU06MRDPB	5.5P	3	2	3,900	8.57
7/16-14UNC	82	26	-	42	8.5	P4	SYU07QSDPB	2.75P	3	4	P4	PYU07QSDPB	5.5P	3	2	5,590	9.4
7/16-20UNF	82	26	-	42	8.5	P3	SYU07NRDPB	2.75P	3	4	P3	PYU07NRDPB	5.5P	3	2	5,480	9.96
1/2-13UNC	88	26	-	45	10.5	P4	SYU08RSDPB	2.75P	3	4	P4	PYU08RSDPB	5.5P	3	2	5,810	10.9
1/2-20UNF	88	26	-	45	10.5	P3	SYU08NRDPB	2.75P	3	4	P4	PYU08NSDPB	5.5P	3	2	5,930	11.54
9/16-12UNC	95	26	-	48	12.5	-	-	-	-	-	P4	PYU09SSDPB	5.5P	3	2	8,840	12.3
9/16-18UNF	95	26	-	48	12.5	-	-	-	-	-	P4	PYU09OSDPB	5.5P	3	2	8,840	13.00
5/8-11UNC	95	26	-	48	12.5	P4	SYU10USDPB	2.75P	3	4	P5	PYU10UTDPB	5.5P	3	2	8,840	13.7
5/8-18UNF	95	26	-	48	12.5	P3	SYU10ORDPB	2.75P	3	4	P4	PYU10OSDPB	5.5P	3	2	8,840	14.6
3/4-10UNC	105	33	-	50	15	P4	SYU12VSDPB	2.75P	3	5	P5	PYU12VTDPB	5.5P	3	3	16,100	16.7
3/4-16UNF	105	33	-	50	15	P4	SYU12PSDPB	2.75P	3	5	P4	PYU12PSDPB	5.5P	3	3	15,900	17.59
7/8-9UNC	115	33	-	55	17	-	-	-	-	-	P5	PYU14WTDPB	5.5P	3	3	22,700	19.6
7/8-14UNF	115	33	-	55	17	-	-	-	-	-	P4	PYU14QSDPB	5.5P	3	3	22,700	20.6
1-8UNC	125	39	-	58	19	P5	SYU16XTDPB	2.75P	3	5	P6	PYU16XUDPB	5.5P	3	3	33,200	22.4
1-12UNF	125	39	-	58	19	P4	SYU16SSDPB	2.75P	3	5	P5	PYU16STDPB	5.5P	3	3	33,200	23.5

Warning

- ◆Tools may shatter. Wear cover or eye glasses to avoid injury during tapping.
- ◆Tools may shatter. Use tools under the proper tapping condition.
- ◆Never wear gloves during turning operations as the gloves may get caught with the tools.
- ◆Wear safety shoes to avoid injuring yourself by the falling tools.
- ◆On attaching tools to the machine, fasten firmly to avoid chattering and run-out.
- ◆Fasten the work pieces firmly so that they never move during operation. Never use worn tools or damaged tools with chipping.
- ◆Take a special care to fire trouble. High temperature during machining may cause fire.

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