Think threads with YAMAWA

HV Series

Taps that achieve excellent chip evacuation!

▪ Hybrid Value Spiral Fluted Taps for Steels ▪

HVSP
HVSP G
HVSP LH
HVSP ZP

▪ Hybrid Value Spiral Pointed Taps for Steels ▪

HVPO
HVPO ZP

Z-PRO
Ultimate Machining Taps
DIN

DIN

Z-PRO Ultimate Machining Taps

Hybrid Value Spiral Fluted Taps for Steels HVSP

HSS OX 2.5

The uniquely designed flute shape+BLF(special relief on the full thread area) dramatically reduce chipping issues.

- Specially designed flute shape and relief on the full thread area improves chip ejection.
- Heel cut performance has been improved in order to accurately cut the chips deep inside the internal thread and eliminate the remaining chips.
- Due to improved chip ejection, chipping of the chamfer area is less likely to occur during the reversal of the tap.
- The threads on HVSP are specially designed with three full threads and subsequent threads ground down to the pitch diameter to prevent chipping.

Tapping conditions:HVSP M36×4

Workpiece Materials	SS400
Tapping Speed	3m/min
Tapping Length	50mm
Machine Type	Radial drilling machine
Tapping Fluid	Non-water soluble cutting oil

○Full Thread Part

Conventional Product

Chipping

HVSP 250 Holes Ongoing Processing Without Chipping

Tapping conditions:HVSP M10×1.5

Workpiece Materials	S45C
Tapping Speed	12m/min
Tapping Length	17mm
Machine Type	Horizontal MC
Tapping Fluid	Water soluble cutting fluid

Smooth chip evacuation

1,184 Holes processed without chipping

Workpiece materials and tapping speeds

Workpiece Materials		Guideline for tapping speed (m/min)			
		M2~M2.6	M3~M5 No.5~No.10	M6~M16 U1/4~U5/8 G 1/16~G 3/8	M18~M48 U3/4~U2 G 1/2~G 1 1/2
Low Carbon Steels	~S20C/SS400	1~7	3~9	3~12	3~8
Medium Carbon Steels	S25C~S45C	1~7	3~9	3~12	3~8
High Carbon Steels	S45C~	1~7	3~9	3~12	3~8
Alloy Steels	SCM/SCr	1~7	3~9	3~12	3~8
Thermal Refined Steels	25~35HRC	-	-	~5	~5
Cast Steels	SC	1~7	3~9	3~12	3~8
Stainless Steels	SUS303/SUS304	~5	~5	~5	~5

Think threads with YAMAWA

Hybrid Value Spiral Fluted Taps for Steels

HVSP

HSS OX 2.5

DIN

Dimensions and Sizes

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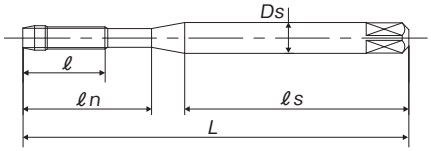

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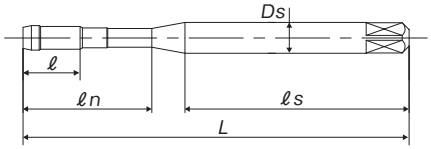

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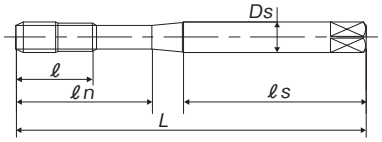

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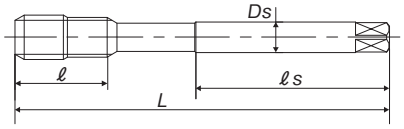

Size	Class	Code	Chamfer	L (mm)	ℓ (mm)	ℓn (mm)	ℓs (mm)	Ds (mm)	No. of flutes	TYPE
Metric Threads										
M2×0.4	ISO2X	SD2.0EBEEXJ	C (2.5P)	45	8	10	32	2.8	2	1
M2.3×0.4	ISO2X	SD2.3EBEEXJ	C (2.5P)	45	9	11	32	2.8	2	1
M2.5×0.45	ISO2X	SD2.5FBEEXJ	C (2.5P)	50	8	15	33	2.8	2	1
M2.6×0.45	ISO2X	SD2.6FBEEXJ	C (2.5P)	50	8	15	33	2.8	2	1
M3×0.5	ISO2X	SD3.0GYEEXJ	C (2.5P)	56	9	18	34	3.5	3	1
M3×0.35	ISO2X	SD3.0DREEXJ	C (2.5P)	56	6.5	18	34	3.5	3	2
M4×0.7	ISO2X	SD4.0IYEEXJ	C (2.5P)	63	13	21	38	4.5	3	1
M4×0.5	ISO2X	SD4.0GSEEXJ	C (2.5P)	63	9	21	38	4.5	3	2
M5×0.8	ISO2X	SD5.0KYEEXJ	C (2.5P)	70	14	25	39	6	3	1
M5×0.5	ISO2X	SD5.0GSEEXJ	C (2.5P)	70	9	25	39	6	3	2
M6×1	ISO2X	SD6.0MYEEXJ	C (2.5P)	80	15	30	45	6	3	3
M6×0.75	ISO2X	SD6.0JSEEXJ	C (2.5P)	80	15	30	45	6	3	3
M6×0.5	ISO2X	SD6.0GSEEXJ	C (2.5P)	80	9	30	45	6	3	3
M7×1	ISO2X	SD7.0MBEEXJ	C (2.5P)	80	15	30	45	7	3	3
M8×1.25	ISO2X	SD8.0NYEEXJ	C (2.5P)	90	19	35	47	8	3	3
M8×1	ISO2X	SM8.0MSEEXJ	C (2.5P)	90	19	-	46	6	3	4
M10×1.5	ISO2X	SD010OYEEXJ	C (2.5P)	100	23	39	52	10	3	3
M10×1.25	ISO2X	SM010NSEEXJ	C (2.5P)	100	23	-	51	7	3	4
M10×1	ISO2X	SM010MSEEXJ	C (2.5P)	90	19	-	46	7	3	4
M12×1.75	ISO2X	SG012PSEEXJ	C (2.5P)	110	26	-	56	9	3	4
M12×1.5	ISO2X	SM012OSEEXJ	C (2.5P)	100	21	-	51	9	3	4
M12×1.25	ISO2X	SM012NSEEXJ	C (2.5P)	100	21	-	51	9	3	4
M12×1	ISO2X	SM012MBEEXJ	C (2.5P)	100	21	-	51	9	3	4
M14×2	ISO2X	SG014QSEEXJ	C (2.5P)	110	26	-	56	11	3	4
M14×1.5	ISO2X	SM014OSEEXJ	C (2.5P)	100	21	-	51	11	3	4
M14×1.25	ISO2X	SM014NBEEXJ	C (2.5P)	100	21	-	51	11	3	4
M16×2	ISO2X	SG016QSEEXJ	C (2.5P)	110	26	-	56	12	3	4
M16×1.5	ISO2X	SM016OSEEXJ	C (2.5P)	100	21	-	51	12	3	4
M18×2.5	ISO2X	SG018RTEEXJ	C (2.5P)	125	33	-	64	14	4	4
M18×1.5	ISO2X	SM018OTEEXJ	C (2.5P)	110	24	-	56	14	4	4
M20×2.5	ISO2X	SG020RTEEXJ	C (2.5P)	140	33	-	71	16	4	4
M20×1.5	ISO2X	SM020OTEEXJ	C (2.5P)	125	24	-	64	16	4	4
M22×2.5	ISO2X	SG022RTEEXJ	C (2.5P)	140	33	-	71	18	4	4
M22×1.5	ISO2X	SM022OTEEXJ	C (2.5P)	125	24	-	64	18	4	4
M24×3	ISO2X	SG024STEEXJ	C (2.5P)	160	37	-	82	18	4	4
M24×1.5	ISO2X	SM024OTEEXJ	C (2.5P)	140	27	-	71	18	4	4
M27×3	ISO2X	SG027STEEXJ	C (2.5P)	160	37	-	82	20	4	4
M27×1.5	ISO2X	SM027OTEEXJ	C (2.5P)	140	27	-	71	20	4	4
M30×3.5	ISO2X	SG030TBEEXJ	C (2.5P)	180	44	-	92	22	4	4
M30×3	ISO2X	SM030SUEEXJ	C (2.5P)	180	44	-	92	22	4	4
M30×2	ISO2X	SM030QBEEXJ	C (2.5P)	150	27	-	77	22	4	4
M30×1.5	ISO2X	SM030OUEEXJ	C (2.5P)	150	27	-	77	22	4	4
M32×1.5	ISO2X	SM032OBEEXJ	C (2.5P)	150	27	-	77	22	4	4
M33×3.5	ISO2X	SG033TBEEXJ	C (2.5P)	180	46	-	92	25	4	4
M33×3	ISO2X	SM033SUEEXJ	C (2.5P)	180	46	-	92	25	4	4
M33×1.5	ISO2X	SM033OBEEXJ	C (2.5P)	160	29	-	82	25	4	4
M36×4	ISO2X	SG036UBEEXJ	C (2.5P)	200	52	-	102	28	4	4
M36×3	ISO2X	SM036SUEEXJ	C (2.5P)	200	52	-	102	28	4	4
M36×2	ISO2X	SM036QBEEXJ	C (2.5P)	170	29	-	87	28	4	4
M36×1.5	ISO2X	SM036OBEEXJ	C (2.5P)	170	29	-	87	28	4	4
M39×4	ISO2X	SG039UBEEXJ	C (2.5P)	200	52	-	102	32	4	4
M39×3	ISO2X	SM039SUEEXJ	C (2.5P)	200	52	-	102	32	4	4
M42×4.5	ISO2X	SG042VBEEXJ	C (2.5P)	200	59	-	102	32	4	4
M42×3	ISO2X	SM042SUEEXJ	C (2.5P)	200	59	-	102	32	4	4
M48×5	ISO2X	SG048WBEEXJ	C (2.5P)	250	65	-	128	36	4	4
M48×3	ISO2X	SM048SUEEXJ	C (2.5P)	225	49	-	115	36	4	4

Z-PRO Ultimate Machining Taps

Hybrid Value Spiral Fluted Taps for Steels

HVSP

HSS OX 2.5

Dimensions and Sizes

Size	Class	Code	Chamfer	L (mm)	ℓ (mm)	ℓn (mm)	ℓs (mm)	Ds (mm)	No. of flutes	TYPE
Unified Threads										
No.5-40UNC	2BX	SDUN5HYEEXJ	C (2.5P)	56	5	18	34	3.5	3	2
No.5-44UNF	2BX	SDUN5GYEEXJ	C (2.5P)	56	5	18	34	3.5	3	2
No.6-32UNC	2BX	SDUN6JYEEXJ	C (2.5P)	56	7	19	32	4	3	2
No.6-40UNF	2BX	SDUN6HYEEXJ	C (2.5P)	56	7	19	32	4	3	2
No.8-32UNC	2BX	SDUN8JYEEXJ	C (2.5P)	63	7	21	38	4.5	3	2
No.8-36UNF	2BX	SDUN8IYEEXJ	C (2.5P)	63	7	21	38	4.5	3	2
No.10-24UNC	2BX	SDUNAMYEEXJ	C (2.5P)	70	9	24	39	6	3	2
No.10-32UNF	2BX	SDUNAJYEEXJ	C (2.5P)	70	9	24	39	6	3	2
1/4-20UNC	2BX	SDU04NYEEXJ	C (2.5P)	80	11	30	42	7	3	2
1/4-28UNF	2BX	SDU04KYEEXJ	C (2.5P)	80	11	30	42	7	3	2
5/16-18UNC	2BX	SDU05OYEEXJ	C (2.5P)	90	19	-	47	8	3	4
5/16-24UNF	2BX	SMU05MYEEXJ	C (2.5P)	90	19	-	46	6	3	4
3/8-16UNC	2BX	SDU06PYEEXJ	C (2.5P)	100	23	-	54	9	3	4
3/8-24UNF	2BX	SMU06MYEEXJ	C (2.5P)	100	23	-	51	7	3	4
7/16-14UNC	2BX	SGU07QYEEXJ	C (2.5P)	100	23	-	51	8	3	4
7/16-20UNF	2BX	SMU07NYEEXJ	C (2.5P)	100	23	-	51	8	3	4
1/2-13UNC	2BX	SGU08RYEEXJ	C (2.5P)	110	26	-	56	9	3	4
1/2-20UNF	2BX	SMU08NYEEXJ	C (2.5P)	100	21	-	51	9	3	4
9/16-12UNC	2BX	SGU09SYEEXJ	C (2.5P)	110	26	-	56	11	3	4
9/16-18UNF	2BX	SMU09OYEEXJ	C (2.5P)	100	21	-	51	11	3	4
5/8-11UNC	2BX	SGU10UYEEXJ	C (2.5P)	110	26	-	56	12	3	4
5/8-18UNF	2BX	SMU10OYEEXJ	C (2.5P)	100	21	-	51	12	3	4
3/4-10UNC	2BX	SGU12VYEEXJ	C (2.5P)	125	33	-	64	14	4	4
3/4-16UNF	2BX	SMU12PYEEXJ	C (2.5P)	110	24	-	56	14	4	4
7/8-9UNC	2BX	SGU14WYEEXJ	C (2.5P)	140	33	-	71	18	4	4
7/8-14UNF	2BX	SMU14QYEEXJ	C (2.5P)	125	24	-	64	18	4	4
1-8UNC	2BX	SGU16XYEEXJ	C (2.5P)	160	37	-	82	18	4	4
1-12UNF	2BX	SMU16SYEEXJ	C (2.5P)	140	27	-	71	18	4	4
1 1/8-7UNC	2BX	SGU18YYEEXJ	C (2.5P)	180	44	-	92	22	4	4
1 1/8-8UN	2BX	SMU18XYEEXJ	C (2.5P)	180	44	-	92	22	4	4
1 1/8-12UNF	2BX	SMU18SYEEXJ	C (2.5P)	150	27	-	77	22	4	4
1 1/4-7UNC	2BX	SGU20YYEEXJ	C (2.5P)	180	49	-	92	22	4	4
1 1/4-8UN	2BX	SMU20XYEEXJ	C (2.5P)	180	49	-	92	22	4	4
1 1/4-12UNF	2BX	SMU20SYEEXJ	C (2.5P)	150	27	-	77	22	4	4
1 3/8-6UNC	2BX	SGU22ZYEEXJ	C (2.5P)	200	55	-	102	28	4	4
1 3/8-8UN	2BX	SMU22XYEEXJ	C (2.5P)	200	55	-	102	28	4	4
1 3/8-12UNF	2BX	SMU22SYEEXJ	C (2.5P)	170	29	-	87	28	4	4
1 1/2-6UNC	2BX	SGU24ZYEEXJ	C (2.5P)	200	59	-	102	32	4	4
1 1/2-8UN	2BX	SMU24XYEEXJ	C (2.5P)	200	59	-	102	32	4	4
1 1/2-12UNF	2BX	SMU24SYEEXJ	C (2.5P)	170	29	-	87	32	4	4
1 3/4-5UNC	2BX	SGU280YEEXJ	C (2.5P)	220	65	-	112	36	4	4
1 3/4-8UN	2BX	SMU28XYEEXJ	C (2.5P)	200	49	-	102	36	4	4
1 3/4-12UNF	2BX	SMU28SYEEXJ	C (2.5P)	180	31	-	92	36	4	4
2-4 1/2UNC	2BX	SGU329YEEXJ	C (2.5P)	250	73	-	128	40	4	4
2-8UN	2BX	SMU32XYEEXJ	C (2.5P)	225	49	-	115	40	4	4

Dimensions and Sizes

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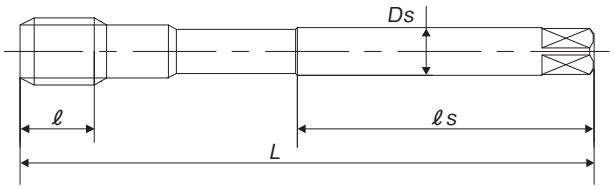

Size	Class	Code	Chamfer	Basic Major Dia.	L (mm)	ℓ (mm)	ℓs (mm)	Ds (mm)	No. of flutes	TYPE
Pipe Threads										
G 1/16-28	ISO228X	SVG0010EEXJ	C (2.5P)	7.723	90	12	46	6	3	1
G 1/8-28	ISO228X	SVG0020EEXJ	C (2.5P)	9.728	90	12	46	7	3	1
G 1/4-19	ISO228X	SVG0040EEXJ	C (2.5P)	13.157	100	14	51	11	3	1
G 3/8-19	ISO228X	SVG0060EEXJ	C (2.5P)	16.662	100	14	51	12	3	1
G 1/2-14	ISO228X	SVG0080EEXJ	C (2.5P)	20.955	125	18	64	16	4	1
G 5/8-14	ISO228X	SVG0100EEXJ	C (2.5P)	22.911	125	18	64	18	4	1
G 3/4-14	ISO228X	SVG0120EEXJ	C (2.5P)	26.441	140	20	71	20	4	1
G 7/8-14	ISO228X	SVG0140EEXJ	C (2.5P)	30.201	150	20	77	22	4	1
G 1-11	ISO228X	SVG0160EEXJ	C (2.5P)	33.249	160	20	82	25	4	1
G 1 1/8-11	ISO228X	SVG0180EEXJ	C (2.5P)	37.897	170	20	87	28	4	1
G 1 1/4-11	ISO228X	SVG0200EEXJ	C (2.5P)	41.910	170	20	87	32	4	1
G 1 1/2-11	ISO228X	SVG0240EEXJ	C (2.5P)	47.803	190	25	97	36	4	1

Z-PRO Ultimate Machining Taps

Hybrid Value Spiral Fluted Taps for Steels (Left-handed threads) HVSP LH

HSS OX 2.5 LH Left hand

Dimensions and Sizes

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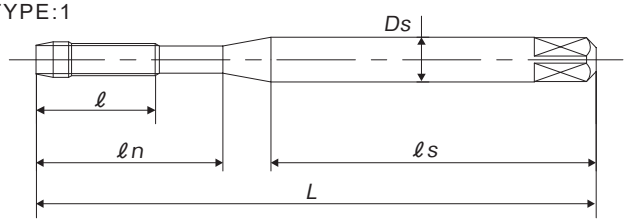

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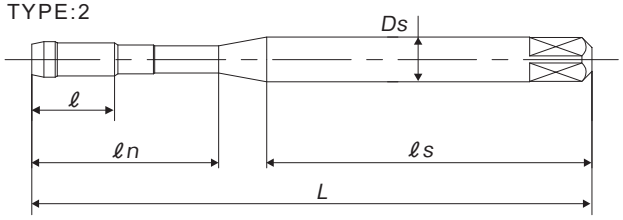

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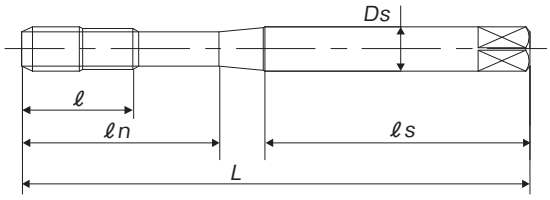


Size	Class	Code	Chamfer	L (mm)	ℓ (mm)	ℓn (mm)	ℓs (mm)	Ds (mm)	No. of flutes	TYPE
Metric Threads										
M3×0.5	ISO2X	3116102035	C (2.5P)	56	9	18	34	3.5	3	1
M3×0.35	ISO2X	3116102036	C (2.5P)	56	6.5	18	34	3.5	3	2
M4×0.7	ISO2X	3116102042	C (2.5P)	63	13	21	38	4.5	3	1
M4×0.5	ISO2X	3116102043	C (2.5P)	63	9	21	38	4.5	3	2
M5×0.8	ISO2X	3116102049	C (2.5P)	70	14	25	39	6	3	1
M5×0.5	ISO2X	3116102051	C (2.5P)	70	9	25	39	6	3	2
M6×1	ISO2X	3116102055	C (2.5P)	80	15	30	45	6	3	3
M6×0.75	ISO2X	3116102056	C (2.5P)	80	15	30	45	6	3	3
M6×0.5	ISO2X	3116102057	C (2.5P)	80	9	30	45	6	3	3
Unified Threads										
No.5-40UNC	2BX	3116104021	C (2.5P)	56	5	18	34	3.5	3	1
No.5-44UNF	2BX	3116104022	C (2.5P)	56	5	18	34	3.5	3	1
No.6-32UNC	2BX	3116104023	C (2.5P)	56	7	19	32	4	3	1
No.6-40UNF	2BX	3116104024	C (2.5P)	56	7	19	32	4	3	1
No.8-32UNC	2BX	3116104029	C (2.5P)	63	7	21	38	4.5	3	1
No.8-36UNF	2BX	3116104030	C (2.5P)	63	7	21	38	4.5	3	1
No.10-24UNC	2BX	3116104039	C (2.5P)	70	9	24	39	6	3	1
No.10-32UNF	2BX	3116104041	C (2.5P)	70	9	24	39	6	3	1
1/4-20UNC	2BX	3116104058	C (2.5P)	80	11	30	42	7	3	1
1/4-28UNF	2BX	3116104062	C (2.5P)	80	11	30	42	7	3	1

Hybrid Value Spiral Fluted Taps for Zinc Plating HVSP ZP

HSS OX 2.5

DIN

Product Features

- The standard line includes tap classes that are optimal for tapping internal threads before zinc plating.
- We developed 3 types of oversized taps in +100µm, +200µm, +300µm, which are in high market demand in certain applications.
- The specifications are based on HVSP (Hybrid Value Spiral Fluted Tap) and can be used with various workpiece materials and machines.
- Stable tapping without chipping is possible in both vertical and horizontal machining.

Applications

It is mainly used for tapping internal threads before plating to prevent rust and corrosion in applications such as road development, bridges, large structures, etc.

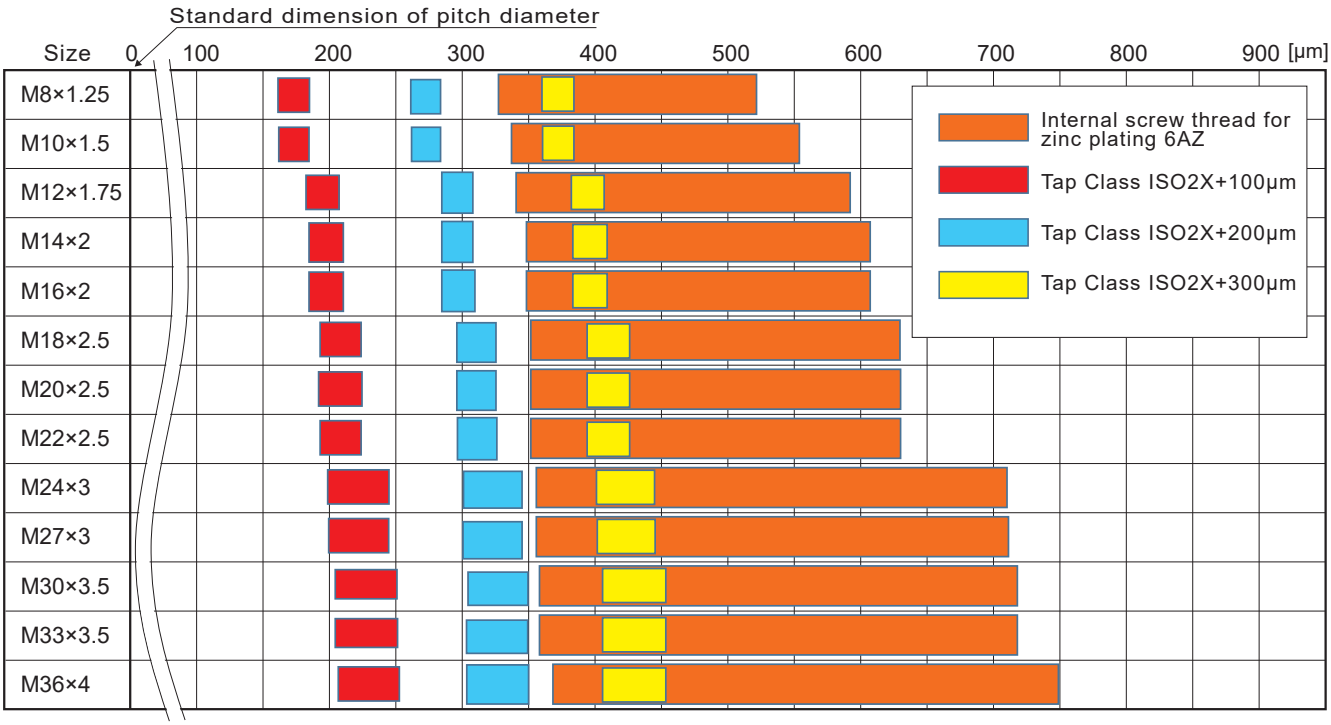


Workpiece materials and tapping speeds

Workpiece materials		Guideline for tapping speed(m/min)	
		M8~M16	M18~M36
Low Carbon Steels	~S20C/SS400	3~12	3~8
Medium Carbon Steels	S25C~S45C	3~12	3~8
High Carbon Steels	S45C~	3~12	3~8

Workpiece materials		Guideline for tapping speed(m/min)	
		M8~M16	M18~M36
Alloy Steels	SCM/SCr	3~12	3~8
Thermal Refined Steels	25~35HRC	3~10	3~8
Cast Steels	SC	3~12	3~8
Stainless Steels	SUS303/SUS304/SUS316	~5	~5

Pitch diameter tolerance range comparison table for tap and internal screw thread classes (for zinc plating)



*M8×1.25 was calculated using the dimensional tolerance formula, which Is the basis for tolerance positions 6AZ specified in ISO-965-4

Explanation

- The graph above is a comparison between the allowable dimensional limits of the internal screw thread of tolerance class 6AZ as per ISO-965-4: ""The allowable dimensional limits of internal screw threads to be mated with hot-dip galvanized external screw thread with a tolerance position of h before plating"" and the class and pitch diameter of HVSP ZP.
- For example, if the nominal size is M10X1.5 and the tolerance class is 6AZ, you can use ISO2X+300µm (ISO2X+0.3mm).
- Because the plating thickness varies depending on the plating type and processing method, there are cases where the required internal screw thread diameter does not conform to the above standards. Therefore, HVSP ZP is offered as standard in ISO2X+100µm(0.1mm),ISO2X+200µm(0.2mm) and ISO2X+300µm (ISO2X+0.3mm) which are tolerances highly requested by the market.

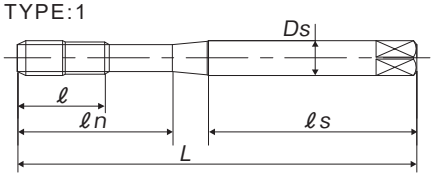
Z-PRO Ultimate Machining Taps

Hybrid Value Spiral Fluted Taps for Zinc Plating HVSP ZP

HSS OX 2.5

Dimensions and Sizes

TYPE:1



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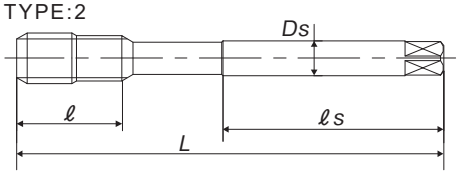

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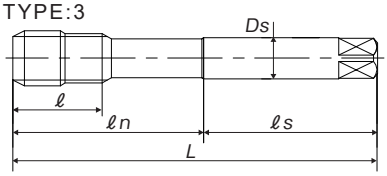


In addition to our Hybrid Value Spiral Fluted Taps for steels, we have added oversized taps that are ideal for threading before zinc plating. They can be used pre-plating for the internal threads of building materials such as those used in roads, railroads, public transportation facilities, and bridges.

Size	Class	Code	Chamfer	L (mm)	ℓ (mm)	ℓn (mm)	ℓs (mm)	Ds (mm)	No. of flutes	TYPE
Metric Threads										
M8×1.25	ISO2X+100	3112501064	C (2.5P)	90	19	35	47	8	3	1
	ISO2X+200	3112601064	C (2.5P)	90	19	35	47	8	3	1
	ISO2X+300	3112701064	C (2.5P)	90	19	35	47	8	3	1
M10×1.5	ISO2X+100	3112501078	C (2.5P)	100	23	39	52.5	10	3	1
	ISO2X+200	3112601078	C (2.5P)	100	23	39	52.5	10	3	1
	ISO2X+300	3112701078	C (2.5P)	100	23	39	52.5	10	3	1
M12×1.75	ISO2X+100	3112501088	C (2.5P)	110	26	-	56	9	3	2
	ISO2X+200	3112601088	C (2.5P)	110	26	-	56	9	3	2
	ISO2X+300	3112701088	C (2.5P)	110	26	-	56	9	3	2
M14×2	ISO2X+100	3112501100	C (2.5P)	110	26	-	56	11	3	2
	ISO2X+200	3112601100	C (2.5P)	110	26	-	56	11	3	2
	ISO2X+300	3112701100	C (2.5P)	110	26	-	56	11	3	2
M16×2	ISO2X+100	3112501114	C (2.5P)	110	26	-	56	12	3	2
	ISO2X+200	3112601114	C (2.5P)	110	26	-	56	12	3	2
	ISO2X+300	3112701114	C (2.5P)	110	26	-	56	12	3	2
M18×2.5	ISO2X+100	3112501128	C (2.5P)	125	33	-	64	14	4	2
	ISO2X+200	3112601128	C (2.5P)	125	33	-	64	14	4	2
	ISO2X+300	3112701128	C (2.5P)	125	33	-	64	14	4	2
M20×2.5	ISO2X+100	3112501141	C (2.5P)	140	33	-	71	16	4	3
	ISO2X+200	3112601141	C (2.5P)	140	33	-	71	16	4	3
	ISO2X+300	3112701141	C (2.5P)	140	33	-	71	16	4	3
M22×2.5	ISO2X+100	3112501156	C (2.5P)	140	33	-	71	18	4	3
	ISO2X+200	3112601156	C (2.5P)	140	33	-	71	18	4	3
	ISO2X+300	3112701156	C (2.5P)	140	33	-	71	18	4	3
M24×3	ISO2X+100	3112501167	C (2.5P)	160	37	-	82	18	4	3
	ISO2X+200	3112601167	C (2.5P)	160	37	-	82	18	4	3
	ISO2X+300	3112701167	C (2.5P)	160	37	-	82	18	4	3
M27×3	ISO2X+100	3112501186	C (2.5P)	160	37	-	82	20	4	3
	ISO2X+200	3112601186	C (2.5P)	160	37	-	82	20	4	3
	ISO2X+300	3112701186	C (2.5P)	160	37	-	82	20	4	3
M30×3.5	ISO2X+100	3112501199	C (2.5P)	180	44	-	92	22	4	3
	ISO2X+200	3112601199	C (2.5P)	180	44	-	92	22	4	3
	ISO2X+300	3112701199	C (2.5P)	180	44	-	92	22	4	3
M33×3.5	ISO2X+100	3112501211	C (2.5P)	180	46	-	92	25	4	3
	ISO2X+200	3112601211	C (2.5P)	180	46	-	92	25	4	3
	ISO2X+300	3112701211	C (2.5P)	180	46	-	92	25	4	3
M36×4	ISO2X+100	3112501225	C (2.5P)	200	52	-	102	28	4	3
	ISO2X+200	3112601225	C (2.5P)	200	52	-	102	28	4	3
	ISO2X+300	3112701225	C (2.5P)	200	52	-	102	28	4	3

Advice: "Guideline for bored hole size and workpiece materials"

[Bored Hole Size Guideline]

When threading before galvanizing, it is recommended to use a bored hole with a larger diameter by the plating thickness. Please refer to the attached materials and confirm final dimensions.

Unit: mm

Size	Oversized bored hole size for reference			Internal screw threads 6H Class minor diameter (min)
	Oversize + 100μm	Oversize + 200μm	Oversize + 300μm	
M8×1.25	6.95	7.05	7.15	6.647
M10×1.5	8.70	8.80	8.90	8.376
M12×1.75	10.5	10.6	10.7	10.106
M14×2	12.2	12.3	12.4	11.835
M16×2	14.2	14.3	14.4	13.835
M18×2.5	15.7	15.8	15.9	15.294
M20×2.5	17.7	17.8	17.9	17.294
M22×2.5	19.7	19.8	19.9	19.294
M24×3	21.2	21.3	21.4	20.752
M27×3	24.2	24.3	24.4	23.752
M30×3.5	26.7	26.8	26.9	26.211
M33×3.5	29.7	29.8	29.9	29.211
M36×4	32.2	32.3	32.4	31.670

DIN

Z-PRO Ultimate Machining Taps

Hybrid Value Spiral Pointed Taps for Steels HVPO

HSS OX <2D 5

▪Product Features

▪The unique flute shapes achieve excellent internal threads and longer tool life by improving chip evacuation and cutting resistance!

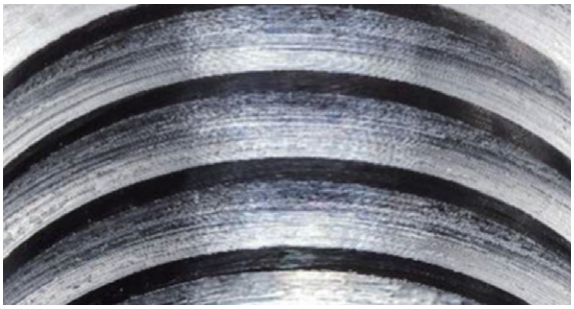
▪The longer overall length increases the clearance between the holder and workpiece, ensuring sufficient supply of cutting oil.

Tapping data

Tapping conditions: HVPO M10x1.5

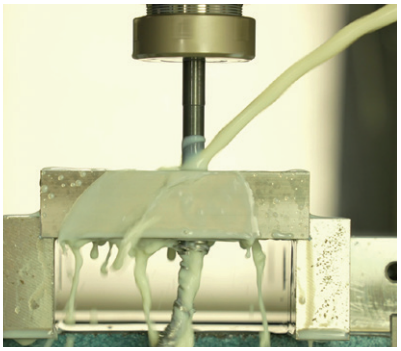
Workpiece material	SS400
Tapping Speed	10m/min
Tapping Length	24mm
Machine Type	Vertical MC
Tapping Fluid	Water soluble cutting fluid

Excellent internal threads



In SS400 tapping, an excellent internal thread surface can be obtained even using water-soluble cutting fluid.

Excellent machining conditions



Thanks to the unique flute shape and semi-long overall length of the tap, water-soluble cutting fluid is sufficiently supplied.

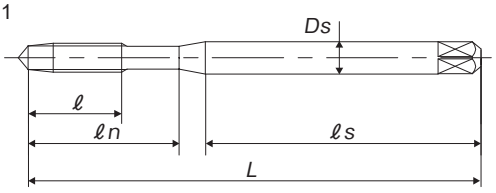
Excellent ejected chips

Workpiece materials and tapping speeds

Workpiece Materials		Guideline for tapping speed (m/min)		
		M3~M5	M6~M16	M18~M36
Low Carbon Steels	~S20C/SS400	3~9	3~12	3~8
Medium Carbon Steels	S25C~S45C	3~9	3~12	3~8
High Carbon Steels	S45C~	3~9	3~12	3~8
Alloy Steels	SCM/SCr	3~9	3~12	3~8
Thermal Refined Steels	25~35HRC	3~9	3~12	~5
Cast Steels	SC	3~9	3~12	3~8
Stainless Steels	SUS303/SUS304	~5	~5	~5

Dimensions and Sizes

TYPE:1



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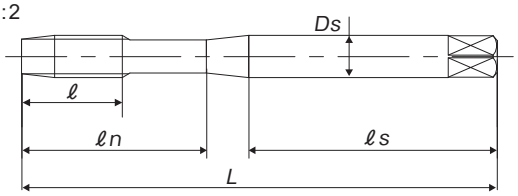

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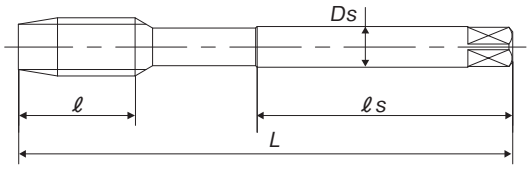


Size	Class	Code	Chamfer	L (mm)	ℓ (mm)	ℓn (mm)	ℓs (mm)	Ds (mm)	No. of flutes	TYPE
Metric Threads										
M3×0.5	ISO2X	3113101035	B (5P)	56	9	18	34	3.5	3	1
M3×0.35	ISO2X	3113101036	B (5P)	56	6.5	18	34	3.5	3	1
M3.5×0.6	ISO2X	3113101038	B (5P)	56	11	20	32	4	3	1
M4×0.7	ISO2X	3113101042	B (5P)	63	13	21	38	4.5	3	1
M4×0.5	ISO2X	3113101043	B (5P)	63	9	21	38	4.5	3	1
M5×0.8	ISO2X	3113101049	B (5P)	70	14	25	39	6	3	1
M5×0.5	ISO2X	3113101051	B (5P)	70	9	25	39	6	3	1
M6×1	ISO2X	3113101055	B (5P)	80	15	30	45	6	3	1
M6×0.75	ISO2X	3113101056	B (5P)	80	15	30	45	6	3	1
M6×0.5	ISO2X	3113101057	B (5P)	80	9	30	45	6	3	1
M7×1	ISO2X	3113101060	B (5P)	80	15	30	45	7	3	2
M7×0.75	ISO2X	3113101061	B (5P)	80	13	-	41	5.5	3	3
M7×0.5	ISO2X	3113101062	B (5P)	80	13	-	41	5.5	3	3
M8×1.25	ISO2X	3113101064	B (5P)	90	19	35	47	8	3	2
M8×1	ISO2X	3113101065	B (5P)	90	19	-	46	6	3	3
M8×0.75	ISO2X	3113101066	B (5P)	80	19	-	41	6	3	3
M8×0.5	ISO2X	3113101067	B (5P)	80	19	-	41	6	3	3
M9×1	ISO2X	3113101072	B (5P)	90	19	-	46	7	3	3
M10×1.5	ISO2X	3113101078	B (5P)	100	23	39	52	10	3	2
M10×1.25	ISO2X	3113101079	B (5P)	100	23	-	51	7	3	3
M10×1	ISO2X	3113101080	B (5P)	90	19	-	46	7	3	3
M12×1.75	ISO2X	3113101088	B (5P)	110	26	-	56	9	3	3
M12×1.5	ISO2X	3113101089	B (5P)	100	21	-	51	9	3	3
M12×1.25	ISO2X	3113101090	B (5P)	100	21	-	51	9	3	3
M12×1	ISO2X	3113101091	B (5P)	100	21	-	51	9	3	3
M14×2	ISO2X	3113101100	B (5P)	110	26	-	56	11	3	3
M14×1.5	ISO2X	3113101102	B (5P)	100	21	-	51	11	3	3

Z-PRO Ultimate Machining Taps

Hybrid Value Spiral Pointed Taps for Steels

HVPO HSS OX <2D 5

Dimensions and Sizes

Size	Class	Code	Chamfer	L (mm)	ℓ (mm)	ℓn (mm)	ℓs (mm)	Ds (mm)	No. of flutes	TYPE
M16×2	ISO2X	3113101114	B (5P)	110	26	-	56	12	3	3
M16×1.5	ISO2X	3113101116	B (5P)	100	21	-	51	12	3	3
M18×2.5	ISO2X	3113101128	B (5P)	125	33	-	64	14	3	3
M18×2	ISO2X	3113101129	B (5P)	125	33	-	64	14	3	3
M18×1.5	ISO2X	3113101130	B (5P)	110	24	-	56	14	3	3
M20×2.5	ISO2X	3113101141	B (5P)	140	33	-	71	16	3	3
M20×2	ISO2X	3113101142	B (5P)	140	33	-	71	16	3	3
M20×1.5	ISO2X	3113101144	B (5P)	125	24	-	64	16	3	3
M20×1	ISO2X	3113101146	B (5P)	125	24	-	64	16	3	3
M22×2.5	ISO2X	3113101156	B (5P)	140	33	-	71	18	3	3
M22×2	ISO2X	3113101157	B (5P)	140	33	-	71	18	3	3
M22×1.5	ISO2X	3113101158	B (5P)	125	24	-	64	18	3	3
M24×3	ISO2X	3113101167	B (5P)	160	37	-	82	18	3	3
M24×1.5	ISO2X	3113101170	B (5P)	140	27	-	71	18	3	3
M25×1.5	ISO2X	3113101177	B (5P)	140	27	-	71	18	3	3
M26×3	ISO2X	3113101181	B (5P)	160	37	-	82	18	4	3
M27×3	ISO2X	3113101186	B (5P)	160	37	-	82	20	4	3
M27×1.5	ISO2X	3113101188	B (5P)	140	27	-	71	20	4	3
M30×3.5	ISO2X	3113101199	B (5P)	180	44	-	92	22	4	3
M30×3	ISO2X	3113101200	B (5P)	180	44	-	92	22	4	3
M30×2	ISO2X	3113101201	B (5P)	150	27	-	77	22	4	3
M30×1.5	ISO2X	3113101202	B (5P)	150	27	-	77	22	4	3
M32×2	ISO2X	3113101207	B (5P)	150	27	-	77	22	4	3
M32×1.5	ISO2X	3113101208	B (5P)	150	27	-	77	22	4	3
M33×3.5	ISO2X	3113101211	B (5P)	180	46	-	92	25	4	3
M33×3	ISO2X	3113101212	B (5P)	180	46	-	92	25	4	3
M36×4	ISO2X	3113101225	B (5P)	200	52	-	102	28	4	3
M36×3	ISO2X	3113101226	B (5P)	200	52	-	102	28	4	3

Z-PRO Ultimate Machining Taps

Hybrid Value Spiral Pointed Taps for Zinc Plating HVPO ZP

HSS OX <2D 5

Product Features

- The standard line includes tap classes that are optimal for tapping internal screw threads before zinc plating.
- We developed 3 types of oversized taps in +100µm, +200µm, +300µm, which are in high market demand in certain applications.
- The specifications are based on HVPO (Hybrid Value Spiral Pointed Tap) and can be used with various workpiece materials and machines.
- Stable tapping without chipping is possible in both vertical and horizontal machining.

Applications

It is mainly used for tapping internal screw threads before plating to prevent rust and corrosion in applications such as road development, bridges, large structures, etc.
For internal screw thread tapping with a large plating thickness in zinc plating.

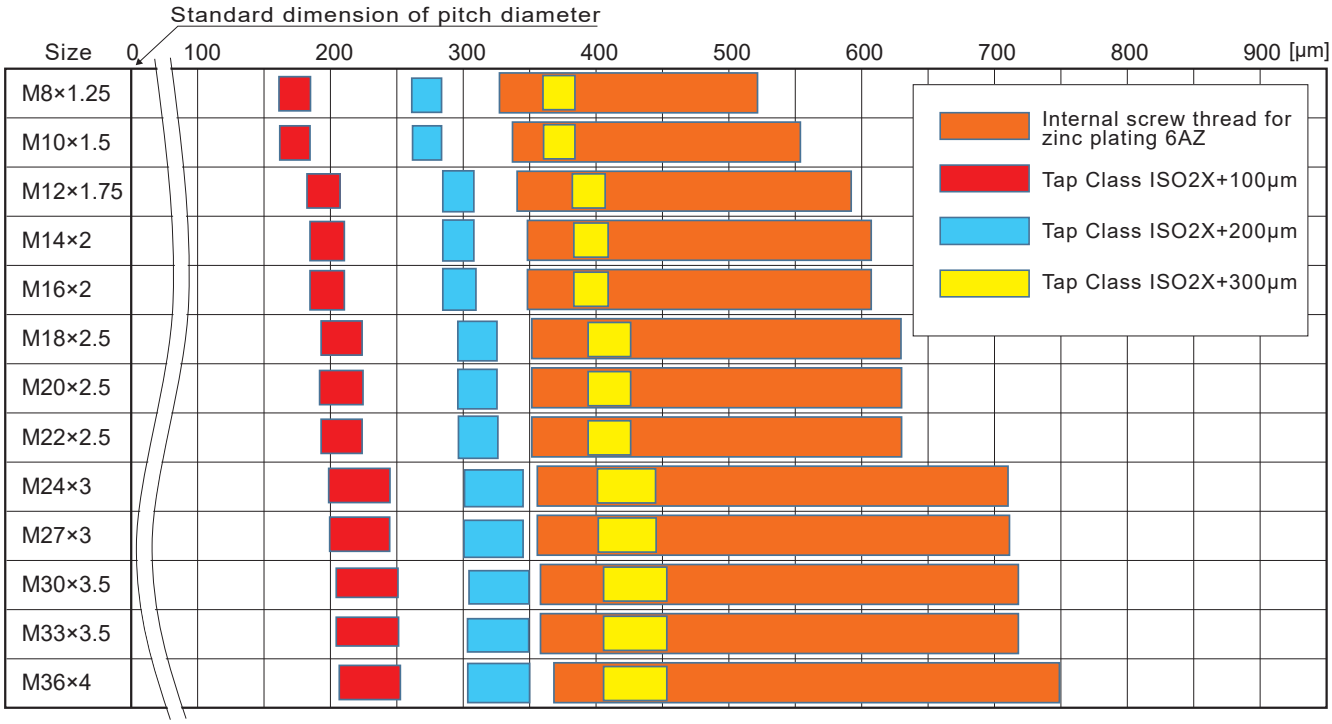


Workpiece materials and tapping speeds

Workpiece materials		Guideline for tapping speed(m/min)	
		M8~M16	M18~M36
Low Carbon Steels	~S20C/SS400	3~12	3~8
Medium Carbon Steels	S25C~S45C	3~12	3~8
High Carbon Steels	S45C~	3~12	3~8

Workpiece materials		Guideline for tapping speed(m/min)	
		M8~M16	M18~M36
Alloy Steels	SCM/SCr	3~12	3~8
Thermal Refined Steels	25~35HRC	3~10	3~8
Cast Steels	SC	3~12	3~8
Stainless Steels	SUS303/SUS304/SUS316	~5	~5

Pitch diameter tolerance range comparison table for tap and internal screw thread classes (for hot-dip galvanizing)



*M8×1.25 was calculated using the dimensional tolerance formula, which Is the basis for tolerance positions 6AZ specified in ISO-965-4

Explanation

- The graph above is a comparison between the allowable dimensional limits of the internal screw thread of tolerance class 6AZ as per ISO-965-4: ""The allowable dimensional limits of internal screw threads to be mated with hot-dip galvanized external screw thread with a tolerance position of h before plating"" and the class and pitch diameter of HVPO ZP.
- For example, if the nominal size is M10X1.5 and the tolerance class is 6AZ, you can use ISO2X+300µm(ISO2X+0.3mm).
- Because the plating thickness varies depending on the plating type and processing method, there are cases where the required internal screw thread diameter does not conform to the above standards. Therefore, HVPO ZP is offered as standard in ISO2X+100µm(0.1mm),ISO2X+200µm(0.2mm) and ISO2X+300µm (ISO2X+0.3mm) which are tolerances highly requested by the market.

Z-PRO Ultimate Machining Taps

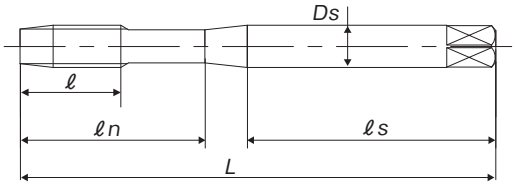
Hybrid Value Spiral Pointed Taps for Zinc Plating

HVPO ZP

HSS OX <2D 5

Dimensions and Sizes

TYPE:1



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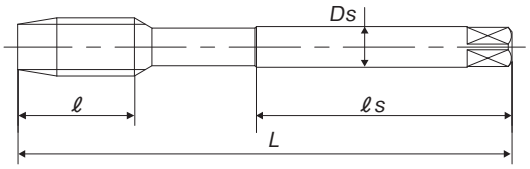


In addition to our Hybrid Value Spiral Pointed Taps for steels, we have added oversized taps that are ideal for threading before zinc plating. They can be used pre-plating for the internal screw threads of building materials such as those used in roads, railroads, public transportation facilities, and bridges.

Size	Class	Code	Chamfer	L (mm)	ℓ (mm)	ℓn (mm)	ℓs (mm)	Ds (mm)	No. of flutes	TYPE
Metric Threads										
M8×1.25	ISO2X+100	3122501064	B (5P)	90	19	35	47	8	3	1
	ISO2X+200	3122601064	B (5P)	90	19	35	47	8	3	1
	ISO2X+300	3122701064	B (5P)	90	19	35	47	8	3	1
M10×1.5	ISO2X+100	3122501078	B (5P)	100	23	39	52.5	10	3	1
	ISO2X+200	3122601078	B (5P)	100	23	39	52.5	10	3	1
	ISO2X+300	3122701078	B (5P)	100	23	39	52.5	10	3	1
M12×1.75	ISO2X+100	3122501088	B (5P)	110	26	-	56	9	3	2
	ISO2X+200	3122601088	B (5P)	110	26	-	56	9	3	2
	ISO2X+300	3122701088	B (5P)	110	26	-	56	9	3	2
M14×2	ISO2X+100	3122501100	B (5P)	110	26	-	56	11	3	2
	ISO2X+200	3122601100	B (5P)	110	26	-	56	11	3	2
	ISO2X+300	3122701100	B (5P)	110	26	-	56	11	3	2
M16×2	ISO2X+100	3122501114	B (5P)	110	26	-	56	12	3	2
	ISO2X+200	3122601114	B (5P)	110	26	-	56	12	3	2
	ISO2X+300	3122701114	B (5P)	110	26	-	56	12	3	2
M18×2.5	ISO2X+100	3122501128	B (5P)	125	33	-	64	14	3	2
	ISO2X+200	3122601128	B (5P)	125	33	-	64	14	3	2
	ISO2X+300	3122701128	B (5P)	125	33	-	64	14	3	2
M20×2.5	ISO2X+100	3122501141	B (5P)	140	33	-	71	16	3	2
	ISO2X+200	3122601141	B (5P)	140	33	-	71	16	3	2
	ISO2X+300	3122701141	B (5P)	140	33	-	71	16	3	2
M22×2.5	ISO2X+100	3122501156	B (5P)	140	33	-	71	18	3	2
	ISO2X+200	3122601156	B (5P)	140	33	-	71	18	3	2
	ISO2X+300	3122701156	B (5P)	140	33	-	71	18	3	2
M24×3	ISO2X+100	3122501167	B (5P)	160	37	-	82	18	3	2
	ISO2X+200	3122601167	B (5P)	160	37	-	82	18	3	2
	ISO2X+300	3122701167	B (5P)	160	37	-	82	18	3	2
M27×3	ISO2X+100	3122501186	B (5P)	160	37	-	82	20	4	2
	ISO2X+200	3122601186	B (5P)	160	37	-	82	20	4	2
	ISO2X+300	3122701186	B (5P)	160	37	-	82	20	4	2
M30×3.5	ISO2X+100	3122501199	B (5P)	180	44	-	92	22	4	2
	ISO2X+200	3122601199	B (5P)	180	44	-	92	22	4	2
	ISO2X+300	3122701199	B (5P)	180	44	-	92	22	4	2
M33×3.5	ISO2X+100	3122501211	B (5P)	180	46	-	92	25	4	2
	ISO2X+200	3122601211	B (5P)	180	46	-	92	25	4	2
	ISO2X+300	3122701211	B (5P)	180	46	-	92	25	4	2
M36×4	ISO2X+100	3122501225	B (5P)	200	52	-	102	28	4	2
	ISO2X+200	3122601225	B (5P)	200	52	-	102	28	4	2
	ISO2X+300	3122701225	B (5P)	200	52	-	102	28	4	2

Advice: "Guideline for bored hole size and workpiece materials"

[Bored Hole Size Guideline]

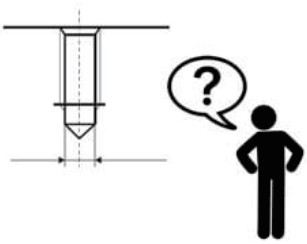
When threading before galvanizing, it is recommended to use a bored hole with a larger diameter by the plating thickness. Please refer to the attached materials and confirm final dimensions.

Unit: mm

Size	Oversized bored hole size for reference			Internal screw threads 6H Class minor diameter (min)
	Oversize + 100μm	Oversize + 200μm	Oversize + 300μm	
M8×1.25	6.95	7.05	7.15	6.647
M10×1.5	8.70	8.80	8.90	8.376
M12×1.75	10.5	10.6	10.7	10.106
M14×2	12.2	12.3	12.4	11.835
M16×2	14.2	14.3	14.4	13.835
M18×2.5	15.7	15.8	15.9	15.294
M20×2.5	17.7	17.8	17.9	17.294
M22×2.5	19.7	19.8	19.9	19.294
M24×3	21.2	21.3	21.4	20.752
M27×3	24.2	24.3	24.4	23.752
M30×3.5	26.7	26.8	26.9	26.211
M33×3.5	29.7	29.8	29.9	29.211
M36×4	32.2	32.3	32.4	31.670

YAMAWA's website contains a lot of valuable information!

Understanding by Manga!
YAMAWA's Tools



Bored Hole size / Bar diameter

NC Program

Safety Data Sheet (SDS)

Catalog · Flyer

YAMAWA Online EXPO NEJITEN

A convenient app that allows you to search anywhere on your smartphone! You can search for products, calculate speeds, and even check recommended drill hole diameters! Please download and use it.

Android

iPhone

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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YAMAWA group for Overseas

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