

# HVSP ZP

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We developed  
a Spiral Fluted Tap  
ideal for tapping  
internal screw threads  
before zinc plating!



*Ultimate Machining Taps*

JIS



**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 +0.1mm, +0.2mm, +0.3mm, 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 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.



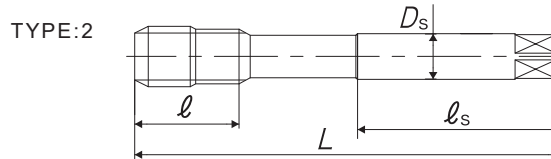
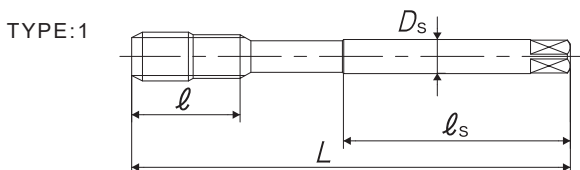
**Compatible with a wide range of work materials**

Applicable workpiece materials/Tapping speed (m/min)

Workpiece material	Size	Guideline for tapping speed
Low Carbon Steels ~S20C/SS400	M8~M16	3~12
	M18~24	3~8
Medium Carbon Steels S25C~S45C	M8~M16	3~12
	M18~24	3~8
High Carbon Steels S45C~	M8~M16	3~12
	M18~24	3~8

Workpiece material	Size	Guideline for tapping speed
Alloy Steels SCM/SCr	M8~M16	3~12
	M18~24	3~8
Thermal Refined Steels 25~35HRC	M8~M16	~5
	M18~24	~5
Stainless Steels SUS303/SUS304/SUS316	M8~M16	~5
	M18~24	~5
Cast Steels SC	M8~M16	3~12
	M18~24	3~8

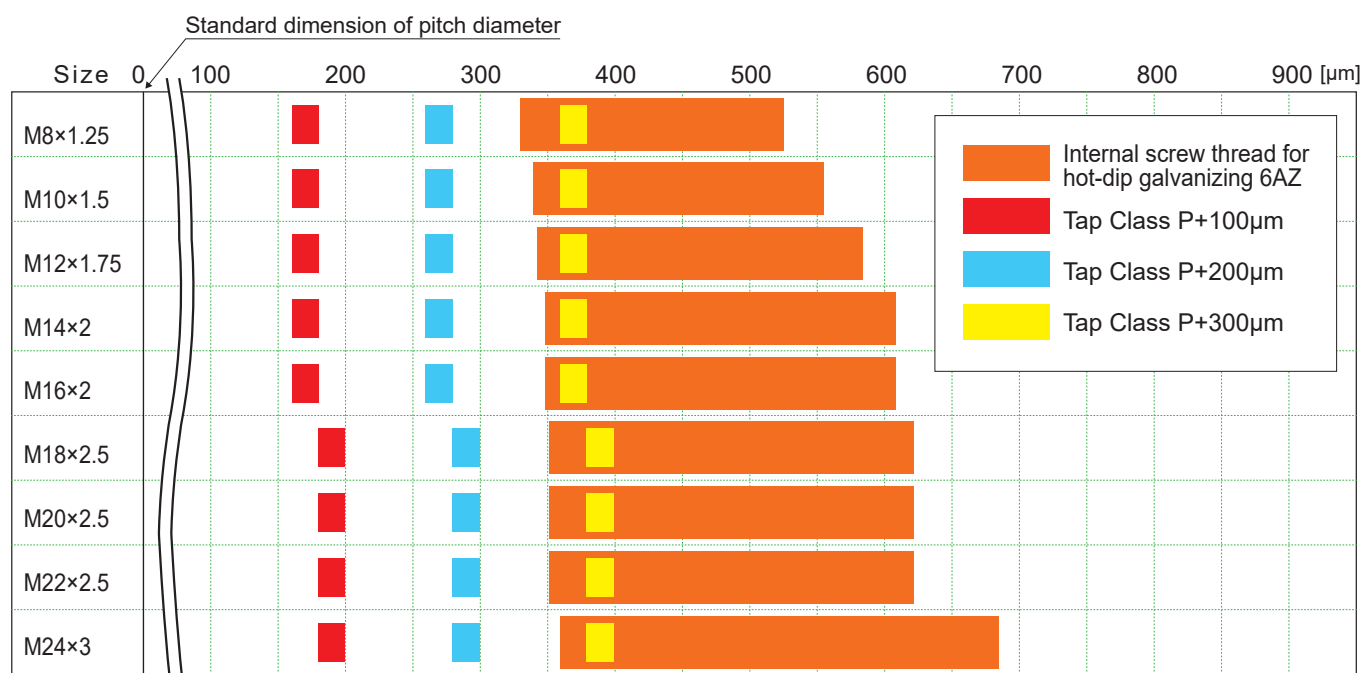
**Dimensions and sizes**



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 screw threads of building materials such as those used in roads, railroads, public transportation facilities, and bridges.

Size	Tap class	Code	Chamfer	L (mm)	l (mm)	ℓn (mm)	ls (mm)	Ds (mm)	No. of flutes	TYPE	Bored Hole Size (For Reference)	MSRP (JPY)
M8×1.25	P4+0.1	1112201064	2.5P	90	19	-	46	6.2	3	1	6.9	2,960
	P4+0.2	1112301064	2.5P	90	19	-	46	6.2	3	1	6.95	2,960
	P4+0.3	1112401064	2.5P	90	19	-	46	6.2	3	1	7	2,960
M10×1.5	P4+0.1	1112201078	2.5P	100	23	-	51	7	3	1	8.66	3,870
	P4+0.2	1112301078	2.5P	100	23	-	51	7	3	1	8.7	3,870
	P4+0.3	1112401078	2.5P	100	23	-	51	7	3	1	8.75	3,870
M12×1.75	P4+0.1	1112201088	2.5P	110	26	-	56	8.5	3	1	10.5	5,200
	P4+0.2	1112301088	2.5P	110	26	-	56	8.5	3	1	10.5	5,200
	P4+0.3	1112401088	2.5P	110	26	-	56	8.5	3	1	10.6	5,200
M14×2	P4+0.1	1112201100	2.5P	110	26	-	56	10.5	3	1	12.2	7,120
	P4+0.2	1112301100	2.5P	110	26	-	56	10.5	3	1	12.2	7,120
	P4+0.3	1112401100	2.5P	110	26	-	56	10.5	3	1	12.3	7,120
M16×2	P4+0.1	1112201114	2.5P	110	26	-	56	12.5	3	1	14.2	9,490
	P4+0.2	1112301114	2.5P	110	26	-	56	12.5	3	1	14.2	9,490
	P4+0.3	1112401114	2.5P	110	26	-	56	12.5	3	1	14.3	9,490
M18×2.5	P5+0.1	1112201128	2.5P	125	33	-	64	14	4	1	15.7	12,700
	P5+0.2	1112301128	2.5P	125	33	-	64	14	4	1	15.7	12,700
	P5+0.3	1112401128	2.5P	125	33	-	64	14	4	1	15.8	12,700
M20×2.5	P5+0.1	1112201141	2.5P	140	33	-	71	15	4	2	17.7	17,300
	P5+0.2	1112301141	2.5P	140	33	-	71	15	4	2	17.7	17,300
	P5+0.3	1112401141	2.5P	140	33	-	71	15	4	2	17.8	17,300
M22×2.5	P5+0.1	1112201156	2.5P	140	33	-	71	17	4	2	19.7	21,900
	P5+0.2	1112301156	2.5P	140	33	-	71	17	4	2	19.7	21,900
	P5+0.3	1112401156	2.5P	140	33	-	71	17	4	2	19.8	21,900
M24×3	P5+0.1	1112201167	2.5P	160	37	-	82	19	4	2	21.2	27,300
	P5+0.2	1112301167	2.5P	160	37	-	82	19	4	2	21.2	27,300
	P5+0.3	1112401167	2.5P	160	37	-	82	19	4	2	21.3	27,300

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



\*M8x1.25 was calculated using the dimensional tolerance formula, which is the basis for tolerance positions 6AZ and 6AX specified in JIS B0209-5.

### "Explanation"

- The graph above is a comparison between the allowable dimensional limits of the internal screw thread of tolerance class 6AZ per JIS B 0209-5."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 tap.
- For example, if the nominal size is M10x1.5 and the tolerance class is 6AZ, you can use P4+300µm (P4+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 has P class +100 µm (+0.1 mm), P class +200 µm (+0.2 mm), P class +300 µm (+0.3 mm), which are highly requested by the market, as standard.

### "For reference"

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 (from JIS B 0209-5)

Tolerance limits for internal screw threads of tolerance class 6AZ

Unit: mm

Size	Major diameter <sup>(1)</sup>		Pitch diameter <sup>(1)</sup>		Minor diameter <sup>(3)</sup>		Thread engagement length	
	Min <sup>(2)</sup>	Max	Min	Max	Min	Max	More than	Less than
M10	10.330	9.536	9.356	9.006	8.706		5	15
M12	12.335	11.398	11.198	10.776	10.441		6	18
M14	14.340	13.253	13.041	12.550	12.175		8	24
M16	16.340	15.253	15.041	14.550	14.175		8	24
M18	18.350	16.950	16.726	16.094	15.644		10	30
M20	20.250	18.950	18.726	18.094	17.644		10	30
M22	22.350	20.950	20.726	20.094	19.644		10	30
M24	24.360	22.676	22.411	21.612	21.112		12	36

Note 1: Dimensions apply to internal screw threads tapped to oversize after hot dip galvanizing.

Note 2: Cylindrical diameter tangent to the bottom of the internal screw thread root.

Note 3: Dimensions apply to internal screw threads before galvanizing or after zinc plating is removed.



## Advice "Selection of "oversized tap" according to plating thickness"


- First, it is necessary to confirm the film thickness of the plating to be applied. When the internal screw thread is plated, the thread diameter becomes smaller. It is necessary to increase the thread diameter in anticipation of that amount.
- Basically, the pitch diameter is reduced by 4 times the thickness of the plating. For example, if the plating thickness is 50 μm, 50 μm x 4 = 200 μm. Therefore, the tap should be +200μm (+0.2mm) oversized.
- However, the thickness of the plating varies depending on the type and method, so it is not easy to select the optimum oversized tap. Therefore, it is recommended to select taps while actually performing trial machining.
- For more information, please refer to the "Bag Full of Wisdom when you are in Trouble" series below.

Excerpt from "Bag Full of Wisdom when you are in Trouble" posted on YAMAWA's website


No.052 Plating thickness and oversized tap  
<https://www.yamawa.com/Portals/0/resource/en/tips/pdf/tips-052.pdf>



No.025 Hot dip zincing and the class of tap to select  
<https://www.yamawa.com/Portals/0/resource/en/tips/pdf/tips-025.pdf>



Bag Full of Wisdom when you are in Trouble




## Advice "Guideline for bored hole size and workpiece materials/tapping speed"

### 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	Normal bored hole size	Oversized bored hole size for reference			Internal screw threads 6H Class minor diameter (min)
		Oversized +0.1mm	Oversized +0.2mm	Oversized +0.3mm	
M8×1.25	6.85	6.95	7.05	7.15	6.647
M10×1.5	8.60	8.70	8.80	8.90	8.376
M12×1.75	10.4	10.5	10.6	10.7	10.106
M14×2	12.1	12.2	12.3	12.4	11.835
M16×2	14.1	14.2	14.3	14.4	13.835
M18×2.5	15.6	15.7	15.8	15.9	15.294
M20×2.5	17.6	17.7	17.8	17.9	17.294
M22×2.5	19.6	19.7	19.8	19.9	19.294
M24×3	21.1	21.2	21.3	21.4	20.752

### 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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