

Think threads with  
**YAMAWA**

# Z-PRO

Z-PRO Ultimate Machining Taps.

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Ultimate Machining Taps

For North American market



**Product Features**



Coated Spiral Pointed Taps

**VUPO**



**Features**

- Longer Life—Improved tool life from using a high grade of powder high speed steel with a special coating!
  - Flute Shape—Improved chip evacuation and cutting resistance from a unique flute shape to produce excellent internal threads!
  - Longer overall Length...Allows a longer projected length out of the holder for better application of tapping fluid.
- The Z-PRO VUPO is designed for use with water-soluble tapping fluid where there is a good coolant supply.

**Recommended tapping range**

Recommended for high performance machining centers with water soluble tapping fluid.



Lubricant	Hole Shape	Tapping Range	Hand Tapping		Drilling Machine		Low Speed		Middle Speed		High Speed	
Water Soluble	Products									<b>VUSP</b> <b>VUSP 1.5P</b> <b>VUSP CH</b> <b>VUPO</b>		
Water Insoluble	Products	IHT	ISP		SP		ZELX SS SP ZELX NI SP ZELX TI SP					
			IPO		PO		ZELX SS PO ZELX NI PO ZELX TI LHSP					

**Tapping Conditions**



Workpiece Material	Tapping Speed(sfm)
Low Carbon Steels	30~100
Medium Carbon Steels / High Carbon Steels	30~100
Alloy Steels	30~100
Stainless Steels	15~50

Workpiece Material	Tapping Speed(sfm)
Tools Steels	15~50
Ductile Cast Irons	30~115
Wrought Aluminum	30~115
Aluminum Alloy Castings	30~115

\*For smaller diameters, slightly reduce tapping speed.

## Tapping Conditions M10×1.5

Workpiece Material	1050
Tapping Length	0.8inch
Tapping Speed	70sfm
Machinery	Vertical Machining center
Tapping Fluid	Water-soluble tapping fluid

	Conventional tap	VUPO
Wear After 560 Threads		

## Tapping Conditions 1/4-20UNC

Size	1/4-20UNC
Workpiece Material	1050 steel
Tapping Speed	70sfm
Feed	Synchronous
Bored Hole Size	Φ0.205inch
Tapping Length	0.47inch(2D, through hole)
Tapping Machine	Vertical Machining Center BT30
Tapping Fluid	Water-soluble tapping fluid FX-30 5%
Number of processed holes	100

The unique flute shape produces excellent internal threads and the longer overall length allows a longer projected length out of the holder for better application of tapping fluid.

**Excellent internal thread surface finish**




You will have an excellent internal thread surface finish even with using water-soluble cutting fluid.

**Cutting edges**




Cutting edges after tapping 100 holes.

**Ejected chips**

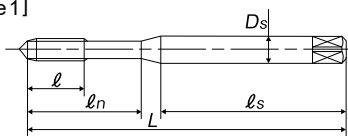


**Ejected chips**

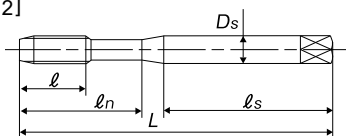


## Coated Spiral Pointed Taps VUPO

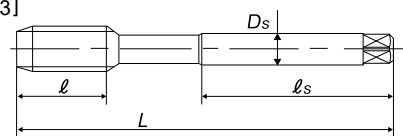
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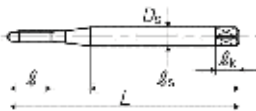


For unified threads

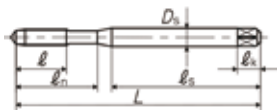
Size	Class	EDP	Chamfer	$L$ (inch)	$l$ (inch)	$l_n$ (inch)	$l_s$ (inch)	$D_s$ (inch)	No. of flutes	Type
5-40UNC	GH2	392703	5P	2.205	0.433	0.736	1.339	0.141	2	1
5-44UNF	GH2	392792	5P	2.205	0.433	0.736	1.339	0.141	2	1
6-32UNC	GH3	392704	5P	2.205	0.433	0.748	1.339	0.141	2	1
6-40UNF	GH2	392784	5P	2.205	0.433	0.748	1.339	0.141	2	1
8-32UNC	GH3	392706	5P	2.48	0.512	0.827	1.535	0.168	2	1
8-36UNF	GH2	392786	5P	2.48	0.512	0.827	1.535	0.168	2	1
10-24UNC	GH3	392709	5P	2.756	0.551	0.945	1.654	0.194	2	1
10-32UNF	GH3	392710	5P	2.756	0.551	0.945	1.654	0.194	2	1
12-24UNC	GH3	392788	5P	3.15	0.591	0.984	1.953	0.22	2	1
12-28UNF	GH3	392789	5P	3.15	0.591	0.984	1.953	0.22	2	1
1/4-20UNC	GH5	392744	5P	3.15	0.591	1.181	1.713	0.255	3	1
1/4-28UNF	GH4	392731	5P	3.15	0.591	1.181	1.713	0.255	3	1
5/16-18UNC	GH5	392745	5P	3.543	0.748	1.378	1.831	0.318	3	2
5/16-24UNF	GH4	392732	5P	3.543	0.748	1.378	1.831	0.318	3	2
3/8-16UNC	GH5	392747	5P	3.937	0.906	1.535	2.028	0.381	3	2
3/8-24UNF	GH4	392733	5P	3.937	0.906	1.535	2.028	0.381	3	2
7/16-14UNC	GH5	392749	5P	3.937	0.906	-	2.008	0.323	3	3
7/16-20UNF	GH5	392750	5P	3.937	0.906	-	2.008	0.323	3	3
1/2-13UNC	GH5	392751	5P	4.331	1.024	-	2.205	0.367	3	3
1/2-20UNF	GH5	392752	5P	4.331	1.024	-	2.205	0.367	3	3
9/16-12UNC	GH5	392753	5P	4.331	1.024	-	2.205	0.429	3	3
9/16-18UNF	GH5	392754	5P	4.331	1.024	-	2.205	0.429	3	3
5/8-11UNC	GH5	392755	5P	4.331	1.024	-	2.205	0.48	3	3
5/8-18UNF	GH5	392756	5P	4.331	1.024	-	2.205	0.48	3	3
3/4-10UNC	GH5	392757	5P	4.921	1.299	-	2.52	0.59	3	3
3/4-16UNF	GH5	392758	5P	4.921	1.299	-	2.52	0.59	3	3
7/8-9UNC	GH6	392795	5P	5.512	1.299	-	2.795	0.697	3	3
7/8-14UNF	GH6	392799	5P	5.512	1.299	-	2.795	0.697	3	3



[Type1]



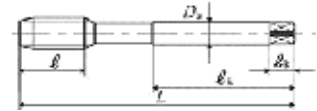
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[Type3]



[Type4]



For metric threads

Size	Class	EDP	Chamfer	L (inch)	ℓ (inch)	ℓn (inch)	ℓs (inch)	Ds (inch)	No. of flutes	Type
M2 X 0.4	D4	392645	5P	1.772	0.314	-	1.161	0.141	2	1
M2.2 X 0.45	D4	392646	5P	1.772	0.314	-	1.161	0.141	2	1
M2.3 X 0.4	D4	392647	5P	1.772	0.314	-	1.161	0.141	2	1
M2.5 X 0.45	D4	392648	5P	2.205	0.354	0.693	1.28	0.141	2	2
M2.6 X 0.45	D4	392649	5P	2.205	0.354	0.709	1.28	0.141	2	2
M3 X 0.5	D4	392615	5P	2.205	0.433	0.736	1.339	0.141	3	2
M3 X 0.35	D4	392644	5P	2.205	0.256	0.736	1.339	0.141	3	2
M4 X 0.7	D5	392617	5P	2.48	0.512	0.815	1.535	0.168	3	2
M4 X 0.5	D4	392643	5P	2.48	0.354	0.815	1.535	0.168	3	2
M5 X 0.8	D5	392619	5P	2.756	0.551	0.984	1.654	0.194	3	2
M5 X 0.5	D4	392642	5P	2.756	0.354	0.984	1.654	0.194	3	2
M6 X 1	D6	392620	5P	3.15	0.591	1.181	1.713	0.255	3	2
M6 X 0.75	D6	392641	5P	3.15	0.591	1.181	1.713	0.255	3	2
M6 X 0.5	D4	392635	5P	3.15	0.354	1.181	1.713	0.255	3	2
M8 X 1.25	D7	392623	5P	3.543	0.748	1.378	1.831	0.318	3	3
M8 X 1	D6	392622	5P	3.543	0.748	1.378	1.831	0.318	3	3
M10 X 1.5	D8	392625	5P	3.937	0.906	1.535	2.126	0.381	3	3
M10 X 1.25	D7	392624	5P	3.937	0.906	1.535	2.126	0.381	3	3
M10 X 1	D6	392601	5P	3.937	0.906	1.535	2.126	0.381	3	3
M12 X 1.75	D8	392627	5P	4.331	1.024	-	2.205	0.367	3	4
M12 X 1.5	D8	392650	5P	4.331	1.024	-	2.205	0.367	3	4
M12 X 1.25	D7	392626	5P	4.331	1.024	-	2.205	0.367	3	4
M14 X 2	D9	392629	5P	4.331	1.024	-	2.205	0.429	3	4
M14 X 1.5	D8	392628	5P	4.331	1.024	-	2.205	0.429	3	4
M16 X 2	D9	392631	5P	4.331	1.024	-	2.205	0.48	3	4
M16 X 1.5	D8	392630	5P	4.331	1.024	-	2.205	0.48	3	4
M18 X 2.5	D9	392633	5P	4.921	1.299	-	2.52	0.542	3	4
M18 X 1.5	D8	392632	5P	4.921	0.945	-	2.52	0.542	3	4
M20 X 2.5	D9	392636	5P	5.512	1.299	-	2.795	0.652	3	4
M20 X 1.5	D8	392637	5P	5.512	0.945	-	2.795	0.652	3	4
M22 X 2.5	D9	392638	5P	5.512	1.299	-	2.795	0.697	3	4
M22 X 1.5	D8	392639	5P	5.512	0.945	-	2.795	0.697	3	4
M24 X 3	D10	392640	5P	6.299	1.457	-	3.228	0.76	3	4
M24 X 1.5	D8	392651	5P	6.299	1.063	-	3.228	0.76	3	4

## Processing data

VUPO

Z-PRO

Coated Spiral Pointed Taps



Ideal for machining with water-soluble tapping fluid !

A durable spiral pointed tap that can be machined on a wide range of work materials.

VUPO Size	Material symbol (Hardness)	Hole size (mm)	Tapping length (mm)(*)	Tapping condition				Tool life (Holes)	Tapping result
				Machine	Tapping speed (m/min)	Feed	Tapping fluid		
M3 X 0.5	SCM440 (39HRC)	2.5	6 (2D)	NC Lathe	5.6	Fully synchronous	Water soluble	1,260	Improved the surface finish of internal threads
M3 X 0.5	S45C (25HRC)	2.5	9 (3D)	Machining center	10	Fully synchronous	Water soluble	500	Excellent
M4 X 0.7	SUS304	3.3	10 (2.5D)	Machining center	10	Fully synchronous	Water soluble	825	Excellent
M4 X 0.7	A5052	3.4	12 (3D)	Machining center	12	Fully synchronous	Water soluble	1,500	Excellent
M6 X 1	S33C	5.1	9 (1.5D)	Machining center	20	Fully synchronous	Water soluble	4,500	Excellent
M8 X 1.25	SUS304	6.8	20 (2.5D)	Machining center	20	Non synchronous	Water soluble	5,700	Excellent
M10 X 1.5	S45C	8.5	25 (2.5D)	Machining center	7.5	Fully synchronous	Water soluble	3,600	Improved the surface finish of internal threads
M12 X 1.75	SCM415	10.3	24 (2D)	Machining center	15	Fully synchronous	Water soluble (20 to 1 dilution)	1,000	Eliminates chipping on cutting edge
M12 X 1.75	SCM440 (30HRC)	10.4	30 (2.5)	NC Lathe	11	Fully synchronous	Water soluble	650	Eliminates chipping on cutting edge
M12 X 1.25	S45C	10.2	36 (3D)	Machining center	30	Non synchronous	Water soluble	1,100	Excellent
M12 X 1.25	S43C	10.8	24 (2D)	Machining center	15	Fully synchronous	Water soluble (20 to 1 dilution)	1,500	Eliminates chipping on cutting edge

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



JQA-QMA14664



JQA-EM3465

**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.

For inquiries, please contact below :



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