

Think threads with  
**YAMAWA**

# Z-PRO

Z-PRO Ultimate Machining Taps. The evolution of high performance tapping.

# Z-PRO

*Ultimate Machining Taps*

*For North American market*













**VUSP VUPO MHYZ**

## Recommended tapping range

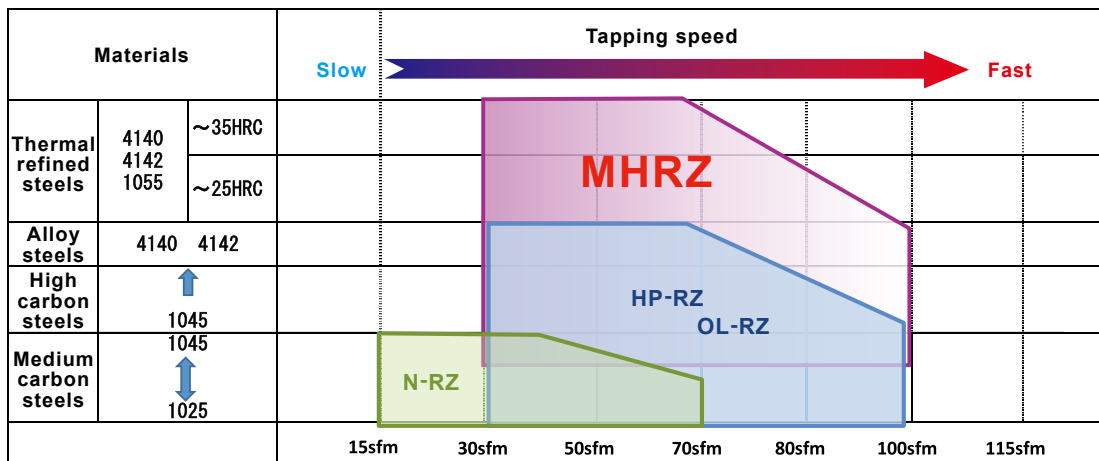
# VUSP, VUSP 1.5P, VUSP CH, VUPO

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							

## MHRZ

- We realized a reduction of tapping torque by introducing our original specifications and design.
- Made from excellent wear-resistant material and special coating techniques have dramatically improved the durability of the tool.
- Consistent tapping on thermal refined materials with hardness up to 35HRC is achieved.
- Water-soluble tapping fluid is recommended when using MHRZ roll taps.



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**VUSP**

**Z-PRO Ultimate Machining Taps.**



**Product Features**



Coated Spiral Fluted Taps **VUSP**

HSS-P Coating

Coated Spiral Fluted Taps 1.5P **VUSP 1.5P**

HSS-P Coating

Coated Spiral Fluted Taps with Coolant Through Hole **VUSP CH**

HSS-P Coating



**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!
- Total Length—Utilizing a longer overall length to avoid the chips interfering with the holder!  
The Z-PRO VUSP 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.



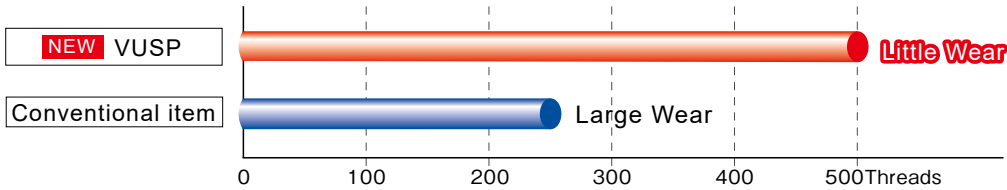
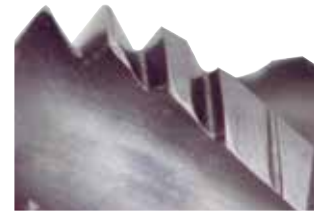
Lubricant	Hole Shape	Tapping Range	Hand Tapping		Drilling Machine		Low Speed		Middle Speed		High Speed		
Water Soluble		Products										<b>VUSP</b> <b>VUSP 1.5P</b> <b>VUSP CH</b> <b>VUPO</b>	
Water Insoluble		Products	IHT	ISP		SP		ZELX SS SP ZELX NI SP ZELX TI SP					
				IPO		PO		ZELX SS PO ZELX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

**Tapping Data**

**Tapping Conditions M3×0.5**

Workpiece Material	1050
Tapping Length	0.18inch
Tapping Speed	70sfm
Machinery	Vertical Machining center
Tapping Fluid	Water-soluble tapping fluid

Enlarged Photo after tapped 250 holes by VUSP



**VUSP 1/4-20UNC**

**[Tapping Conditions]**

Item Name	VUSP 1/4-20UNC GH3
Workpiece Material	1018 steel
Tapping Speed	50sfm
Feed	Synchronous
Bored Hole Length	Φ0.2inch
Tapping Length	0.28inch (1.1D, blind hole)
Machine	Vertical Machining Center BT30
Tapping Fluid	Water-soluble tapping fluid FX-30 5%
Number Of Processed Holes	100

The unique blade shape and longer overall length solved the problem of chips getting caught in the holder and allows for good lubrication flow to the cutting edges of the tap.

**Excellent internal thread surface finish**

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

**Chamfer part**

Chamfer part after tapping 100 holes.

**Tapping Conditions**

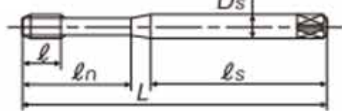
Workpiece Material	Tapping Speed(sfm)
Low Carbon Steels	30~70
Medium Carbon Steels / High Carbon Steels	30~100
Alloy Steels	30~70
Stainless Steels	10~30

Workpiece Material	Tapping Speed(sfm)
Tools Steels	15~30
Ductile Cast Irons	30~100
Wrought Aluminum	30~100
Aluminum Alloy Castings	30~115

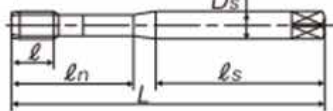
\*For smaller diameters, slightly reduce tapping speed.

**VUSP**

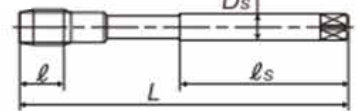
[Type1]



[Type2]



[Type3]



For unified threads

Size	Class	EDP	Chamfer	L (inch)	ℓ (inch)	ℓn (inch)	ℓs (inch)	Ds (inch)	No. of flutes	Type
5-40UNC	GH2	394703	2.5P	2.205	0.197	0.736	1.339	0.141	2	1
5-44UNF	GH2	394792	2.5P	2.205	0.197	0.736	1.339	0.141	2	1
6-32UNC	GH2	394604	2.5P	2.205	0.276	0.748	1.339	0.141	2	1
6-40UNF	GH2	394784	2.5P	2.205	0.276	0.748	1.339	0.141	2	1
8-32UNC	GH3	394707	2.5P	2.48	0.276	0.827	1.535	0.168	2	1
8-36UNF	GH3	394787	2.5P	2.48	0.276	0.827	1.535	0.168	2	1
10-24UNC	GH3	394709	2.5P	2.756	0.354	0.945	1.654	0.194	2	1
10-32UNF	GH3	394710	2.5P	2.756	0.354	0.945	1.654	0.194	2	1
12-24UNC	GH3	394788	2.5P	3.15	0.354	0.984	1.953	0.22	2	1
12-28UNF	GH3	394789	2.5P	3.15	0.354	0.984	1.953	0.22	2	1
1/4-20UNC	GH3	394713	2.5P	3.15	0.433	1.181	1.713	0.255	2	1
1/4-20UNC	GH5	394744	2.5P	3.15	0.433	1.181	1.713	0.255	2	1
1/4-28UNF	GH3	394714	2.5P	3.15	0.433	1.181	1.713	0.255	2	1
1/4-28UNF	GH5	394764	2.5P	3.15	0.433	1.181	1.713	0.255	2	1
5/16-18UNC	GH5	394745	2.5P	3.543	0.472	1.378	1.831	0.318	3	2
3/8-16UNC	GH5	394747	2.5P	3.937	0.512	1.535	2.028	0.381	3	2
7/16-14UNC	GH5	394749	2.5P	3.937	0.512	-	2.008	0.323	3	3
1/2-13UNC	GH5	394751	2.5P	4.331	0.591	-	2.205	0.367	3	3
9/16-12UNC	GH5	394780	2.5P	4.331	0.709	-	2.205	0.429	3	3
5/8-11UNC	GH5	394755	2.5P	4.331	0.709	-	2.205	0.48	3	3

For metric threads

Size	Class	EDP	Chamfer	L (inch)	ℓ (inch)	ℓn (inch)	ℓs (inch)	Ds (inch)	No. of flutes	Type
M3 X 0.5	D4	394615	2.5P	2.205	0.196	0.736	1.339	0.141	3	1
M3 X 0.35	D4	394644	2.5P	2.205	0.196	0.736	1.339	0.141	3	1
M4 X 0.7	D5	394617	2.5P	2.48	0.275	0.815	1.535	0.168	3	1
M4 X 0.5	D4	394643	2.5P	2.48	0.196	0.815	1.535	0.168	3	1
M5 X 0.8	D5	394619	2.5P	2.756	0.354	0.984	1.654	0.194	3	1
M5 X 0.5	D4	394642	2.5P	2.756	0.236	0.984	1.654	0.194	3	1
M6 X 1	D6	394620	2.5P	3.15	0.433	1.181	1.713	0.255	3	1
M6 X 0.75	D6	394735	2.5P	3.15	0.315	1.181	1.713	0.255	3	1
M6 X 0.5	D4	394641	2.5P	3.15	0.315	1.181	1.713	0.255	3	1
M8 X 1.25	D7	394623	2.5P	3.543	0.472	1.378	1.831	0.318	3	2
M8 X 1	D6	394622	2.5P	3.543	0.472	1.378	1.831	0.318	3	2
M10 X 1.5	D8	394625	2.5P	3.937	0.512	1.535	2.126	0.381	3	2
M10 X 1.25	D6	394624	2.5P	3.937	0.512	1.535	2.126	0.381	3	2
M10 X 1	D6	394601	2.5P	3.937	0.512	1.535	2.126	0.381	3	2
M12 X 1.75	D8	394627	2.5P	4.331	0.591	-	2.205	0.367	3	3
M12 X 1.5	D7	394626	2.5P	4.331	0.591	-	2.205	0.367	3	3
M12 X 1.25	D7	394636	2.5P	4.331	0.591	-	2.205	0.367	3	3
M14 X 2	D9	394629	2.5P	4.331	0.709	-	2.205	0.429	3	3
M14 X 1.5	D8	394628	2.5P	4.331	0.551	-	2.205	0.429	3	3
M16 X 2	D9	394630	2.5P	4.331	0.709	-	2.205	0.48	3	3
M16 X 1.5	D8	394631	2.5P	4.331	0.551	-	2.205	0.48	3	3
M18 X 2.5	D9	394633	2.5P	4.921	0.787	-	2.52	0.542	4	3
M18 X 1.5	D8	394632	2.5P	4.921	0.551	-	2.52	0.542	3	3
M20 X 2.5	D9	394634	2.5P	5.512	0.787	-	2.795	0.652	4	3
M20 X 1.5	D8	394635	2.5P	5.512	0.551	-	2.795	0.652	3	3
M22 X 2.5	D9	394640	2.5P	5.512	0.787	-	2.795	0.697	4	3
M22 X 1.5	D8	394637	2.5P	5.512	0.551	-	2.795	0.697	3	3
M24 X 3	D10	394638	2.5P	6.299	0.984	-	3.228	0.76	4	3
M24 X 1.5	D8	394639	2.5P	6.299	0.984	-	3.228	0.76	3	3

### Features

- The chamfer length is 1.5 pitches, making it ideal for machining blind holes where there is little room between the bored hole depth and the full thread length.
- Durability is improved by premium powder HSS and special coating.
- Chip ejection efficiency is improved and cutting resistance is reduced by the unique cutting edge shape, achieving a good internal thread and long tool life.
- Proper tool projection length is secured, preventing chips from interfering with the holder.
- This is most suitable for tapping with water-soluble tapping fluid.

### Tapping Conditions

Workpiece Material	Tapping Speed(sfm)
Low Carbon Steels	15~50
Medium Carbon Steels / High Carbon Steels	15~50
Alloy Steels	15~50
Stainless Steels	10~30

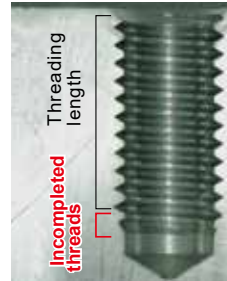
Workpiece Material	Tapping Speed(sfm)
Tools Steels	15~30
Ductile Cast Irons	15~50
Wrought Aluminum	15~70
Aluminum Alloy Castings	15~70

\*For smaller diameters, slightly reduce tapping speed.

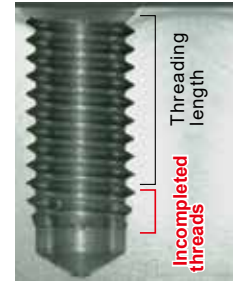
### Tapping Data

#### Tapping condition [M6]

Workpiece Material	Carbon Steel(1050)
Tapping Speed	50sfm
Machine	Machining center, vertical type
Tapping Fluid	Water-soluble tapping fluid
Tapping Length	0.51inch, blind hole



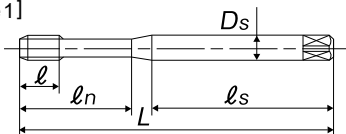
VUSP 1.5P  
Internal thread surface



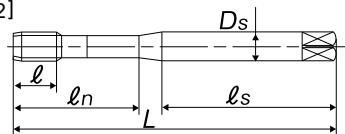
VUSP (chamfer 2.5P)  
Internal thread surface

### Shape and Dimensions

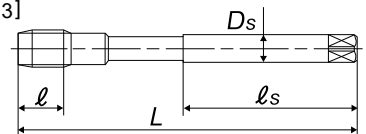
[Type1]



[Type2]



[Type3]



For metric threads

Size	Class	EDP	Chamfer	L (inch)	l (inch)	ln (inch)	ls (inch)	Ds (inch)	No. of flutes	Type
M3 X 0.5	D4	394015	1.5P	2.205	0.197	0.736	1.339	0.141	3	1
M3 X 0.35	D4	394016	1.5P	2.205	0.197	0.736	1.339	0.141	3	1
M4 X 0.7	D5	394017	1.5P	2.48	0.276	0.815	1.535	0.168	3	1
M4 X 0.5	D4	394018	1.5P	2.48	0.197	0.815	1.535	0.168	3	1
M5 X 0.8	D5	394019	1.5P	2.756	0.354	0.984	1.654	0.194	3	1
M5 X 0.5	D4	394021	1.5P	2.756	0.236	0.984	1.654	0.194	3	1
M6 X 1	D6	394020	1.5P	3.15	0.433	1.181	1.713	0.255	3	1
M6 X 0.75	D6	394035	1.5P	3.15	0.315	1.181	1.713	0.255	3	1
M6 X 0.5	D4	394036	1.5P	3.15	0.315	1.181	1.713	0.255	3	1
M8 X 1.25	D7	394023	1.5P	3.543	0.472	1.378	1.831	0.318	3	2
M8 X 1	D6	394022	1.5P	3.543	0.472	1.378	1.831	0.318	3	2
M10 X 1.5	D8	394025	1.5P	3.937	0.512	1.535	2.126	0.381	3	2
M10 X 1.25	D6	394024	1.5P	3.937	0.512	1.535	2.126	0.381	3	2
M10 X 1	D6	394037	1.5P	3.937	0.512	1.535	2.126	0.381	3	2
M12 X 1.75	D8	394027	1.5P	4.331	0.591	-	2.205	0.367	3	3
M12 X 1.5	D7	394038	1.5P	4.331	0.591	-	2.205	0.367	3	3
M12 X 1.25	D7	394026	1.5P	4.331	0.591	-	2.205	0.367	3	3
M14 X 2	D9	394029	1.5P	4.331	0.709	-	2.205	0.429	3	3
M14 X 1.5	D8	394039	1.5P	4.331	0.551	-	2.205	0.429	3	3
M16 X 2	D9	394031	1.5P	4.331	0.709	-	2.205	0.48	3	3
M16X1.5	D8	394030	1.5P	4.331	0.551	-	2.205	0.48	3	3

**Features**

- Improved durability with high-grade powdered HSS and special coating.
  - The unique shape of the cutting edge improves chip evacuation and reduces cutting resistance, resulting in good threading and tool life.
  - Proper tool protrusion is ensured and interference of chips with holder can be avoided.
  - Suitable for water-soluble tapping fluid processing.
  - The cool-hole diameter is optimized for internal lubrication system, and tapping fluid is sufficiently supplied to tap biting area to improve cooling, welding and wear resistance, and to obtain a good surface finish.
- In addition, chips are discharged smoothly, allowing for continuous machining.

**Situation during tapping**



At discharge pressure of 1.5 MPa



At discharge pressure of 3MPa

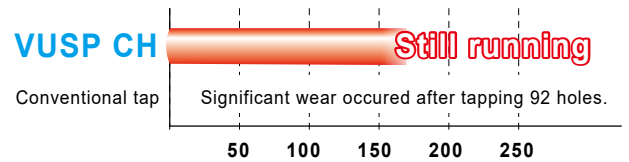


At discharge pressure of 6MPa

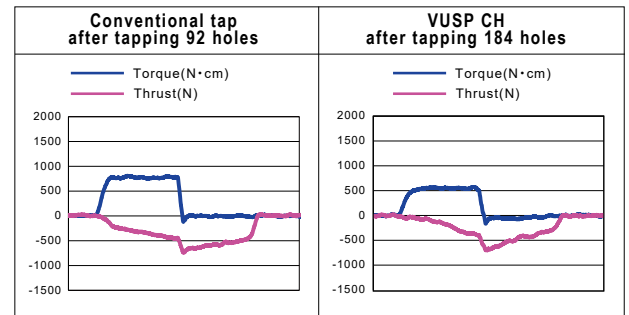


**Tapping Data**

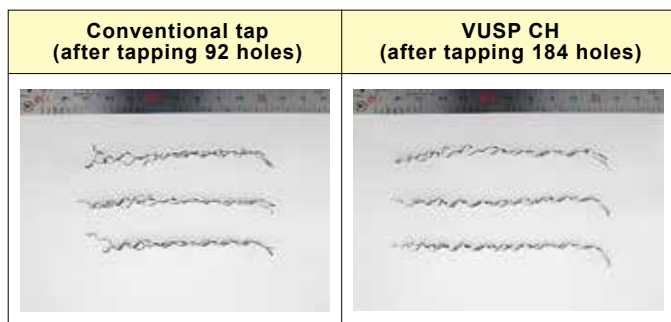
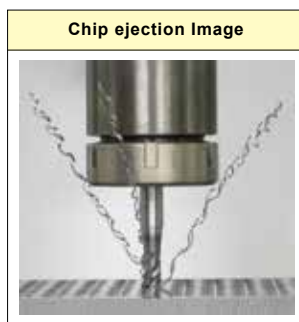
Comparison between Conventional tap and VUSP CH in size 5/16-18UNC. VUSP CH, the coolant through tap offers excellent performance with internal lubrication.



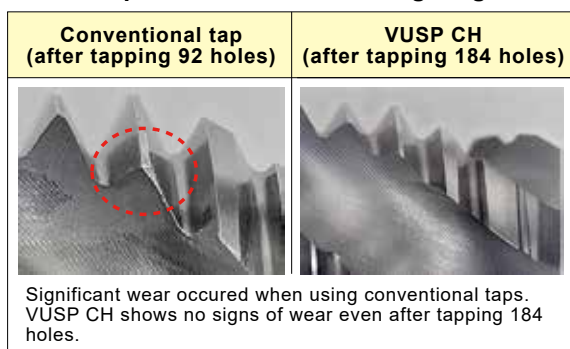
Size	5/16-18UNC
Workpiece Material	4140
Tapping Speed	50sfm
Feed	Synchronous
Bored Hole Size	Φ0.260inch
Tapping Length	0.8inch(2D, blind hole)
Tapping Machine	Vertical Machining Center BT30
Tapping Fluid	Water-soluble tapping fluid FX-30 5%



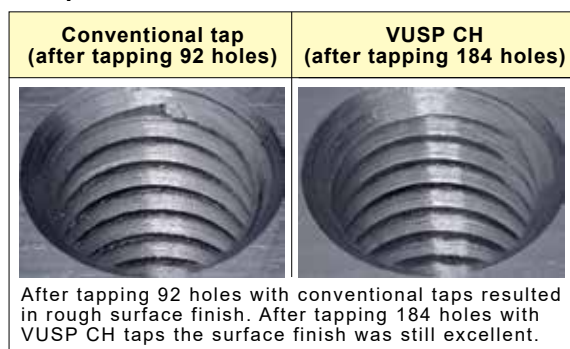
**Ejected chips**



**Comparison of the cutting edges**



**Comparison of the internal thread surface finish**

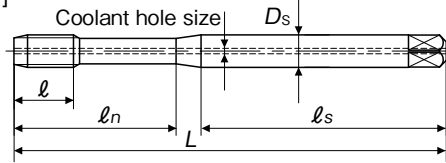




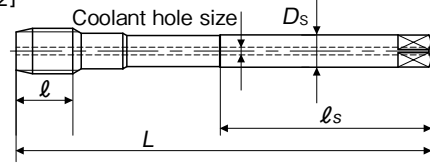
## Tapping Data

Coated Spiral Fluted Taps with Coolant Through Hole **VUSP CH**

[Type1]



[Type2]



For unified threads

Size	Class	EDP	Chamfer	L (inch)	l (inch)	ln (inch)	ls (inch)	Ds (inch)	No. of flutes	Type
5/16-18UNC	GH5	394845	2.5P	3.543	0.472	1.378	1.831	0.318	3	1
3/8-16UNC	GH5	394847	2.5P	3.937	0.512	1.535	2.028	0.381	3	1
1/2-13UNC	GH5	394851	2.5P	4.331	0.591	-	2.205	0.367	3	2

## Tapping Conditions

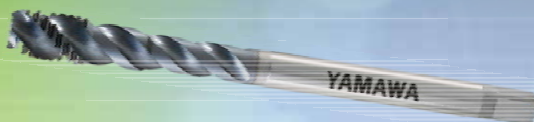
Workpiece Material	Tapping Speed(sfm)
Low Carbon Steels	30~70
Medium Carbon Steels / High Carbon Steels	30~100
Alloy Steels	30~70
Stainless Steels	10~30

Workpiece Material	Tapping Speed(sfm)
Tools Steels	15~30
Ductile Cast Irons	30~70
Wrought Aluminum	30~70
Aluminum Alloy Castings	30~70

\*For smaller diameters, slightly reduce tapping speed.

## Processing data

# VUSP

**Z-PRO**  
 Coated Spiral Fluted Taps


Ideal for machining with water-soluble tapping fluid !

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

VUSP Size	Material symbol (Hardness)	Hole size (mm)	Tapping condition					Tapping fluid	Tool life (Holes)	Tapping result
			Tapping length (mm)(*)	Machine	Tapping speed (m/min)	Feed				
M4 X 0.7	SKD11 (25HRC)	3.3	8 (2D)	Machining center	10	Fully synchronous	Water soluble	500	Excellent	
M5 X 0.8	SCM435	4.2	15 (3D)	NC Lathe	4	Gear	Water soluble (20 to 1 dilution)	1,400	Eliminates breakage due to chip entanglement.	
M8 X 1.25	FCD750	6.8	20 (2.5D)	Machining center	20	Fully synchronous	Water soluble (20 to 1 dilution)	1,500	Eliminates chipping on cutting edge.	
M8 X 1.25	SUS304	6.75	16 (2D)	Machining center	15	Fully synchronous	Water soluble (10 to 1 dilution)	1,390	Eliminates chipping on cutting edge.	
M8 X 1.25	SS400	6.8	16 (2D)	Machining center	30	Fully synchronous	Water soluble	1,500	Excellent	
M8 X 1.25	S50C	6.8	16 (2D)	Machining center	15	Fully synchronous	Water soluble (20 to 1 dilution)	900	Excellent	
M10 X 1.5	SS400	8.5	15 (1.5D)	Machining center	10	Fully synchronous	Water soluble (10 to 1 dilution)	1,500	Excellent	
M12 X 1.75	SS400	10.4	24 (2D)	Machining center	12	Fully synchronous	Water soluble	2,800	Eliminates breakage due to chip entanglement.	
M12 X 1.75	PVC (Thermoplastic resin)	10.3	18 (1.5D)	Machining center	19	Fully synchronous	Water soluble	5,000	Excellent	
M12 X 1.75	SCM415	10.3	24 (2D)	NC Lathe	7	Fully synchronous	Water soluble	800	Excellent	
M12 X 1.75	S35C	10.3	18 (1.5D)	Machining center	30	Fully synchronous	Water soluble	350	Eliminates chipping on cutting edge of full threaded portion	
M12 X 1.25	S45C	10.8	24 (2D)	Drilling machine	5.6	Non synchronous	Oil (Spray)	1,100	Excellent	
M14 X 2	SCM435 (35HRC)	12.1	21 (1.5D)	Machining center	10	Fully synchronous	Water soluble	150	Eliminates breakage due to chip entanglement.	
M16 X 1.5	S45C	14.5	32 (2D)	Machining center	20	Fully synchronous	Water soluble	1,900	Excellent	

※ (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 :

# YMW TAPS USA

1507 E. McFadden Ave. Santa Ana, CA 92705  
 Customer Service 855-YMW-USA1 855-969-8721  
 Ph:714-782-0960 Fx:714-380-6324

[www.ymw tapsusa.com](http://www.ymw tapsusa.com)



Think threads with  
**YAMAWA**

# Z-PRO

Z-PRO Ultimate Machining Taps.

# Z-PRO

*Ultimate Machining Taps*

*For North American market*



**Product Features**



Coated Spiral Pointed Taps

**VUPO**

**HSS-P**

**Coating**



**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										
Water Insoluble						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.

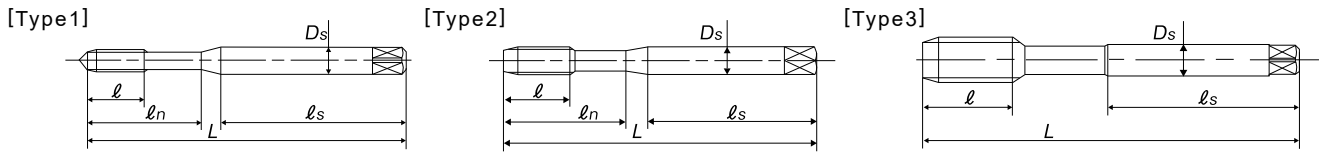
**Ejected chips**



**Ejected chips**



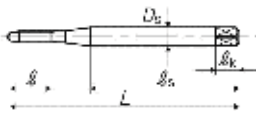
**Coated Spiral Pointed Taps VUPO**



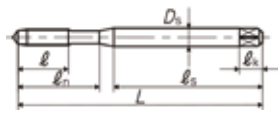
For unified threads

Size	Class	EDP	Chamfer	L (inch)	l (inch)	ln (inch)	ls (inch)	Ds (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]



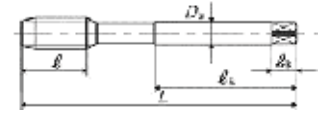
[Type2]



[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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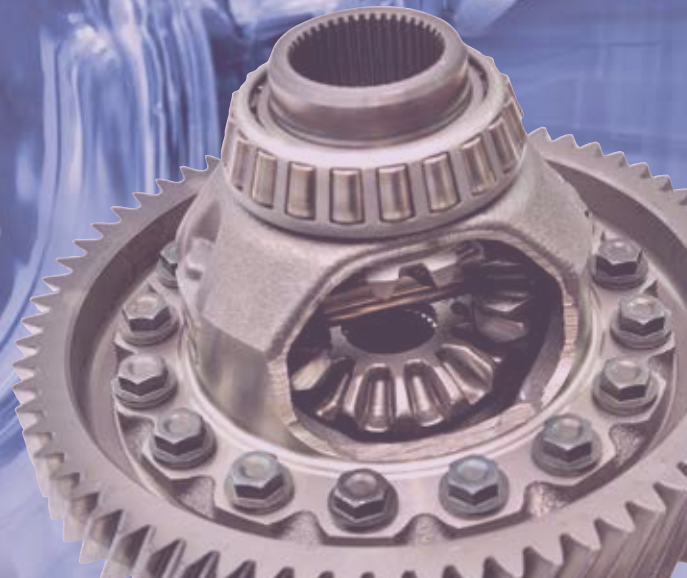
Think threads with  
**YAMAWA**

# WHERZ

Z-PRO Ultimate Machining Taps.  
YAMAWA can solve your tapping problem on medium hard carbon and alloy steels.

# Z-PRO

*Ultimate Machining Taps*  
*For North American market*



Product Features



Roll Taps for Carbon Steels of Medium Hardness

MHRZ

HSS-Co

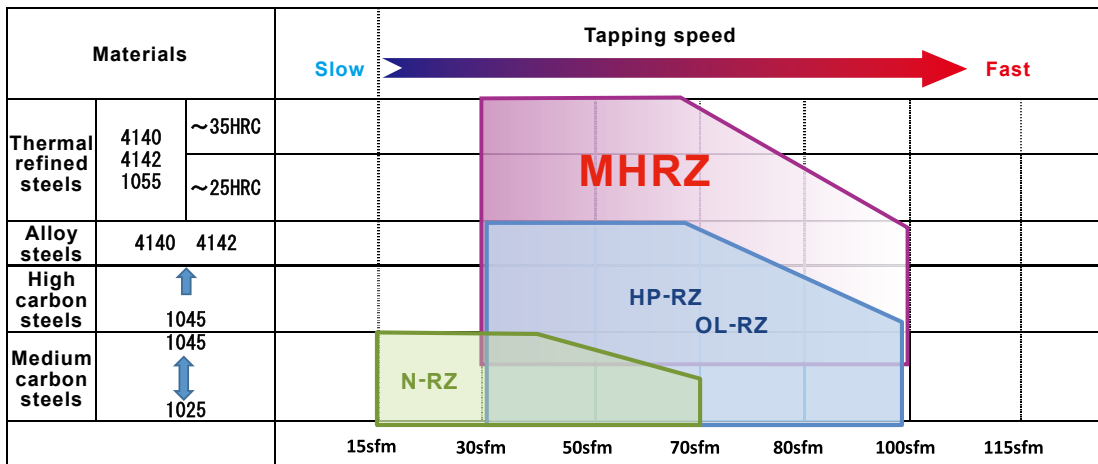
Coating

2~4

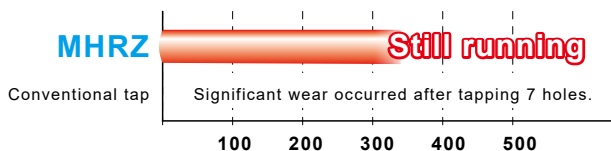


Features

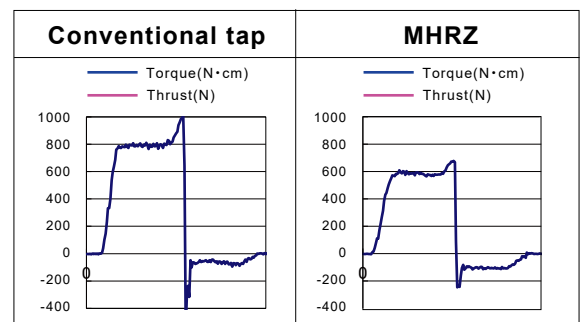
- We realized a reduction of tapping torque by introducing our original specifications and design.
- Made from excellent wear-resistant material and special coating techniques have dramatically improved the durability of the tool.
- Consistent tapping on thermal refined materials with hardness up to 35HRC is achieved.
- Water-soluble tapping fluid is recommended when using MHRZ roll taps.



Tapping Data / Comparison of tapping torque



Size	1/4-20UNC
Workpiece Material	4140
Material hardness	34HRC
Tapping Speed	70sfm
Bored Hole Size	Φ0.23inch
Tapping Length	2D(0.5inch)
Tapping Speed	70sfm
Tapping Fluid	Water-soluble tapping fluid Emersion x 20
Tapping Machine	FANUC α -T10C



Our MHRZ taps have made it possible to tap 4140 material with hardness of 35HRC. This material was considered difficult to be processed with roll form taps because of the high tapping torque.

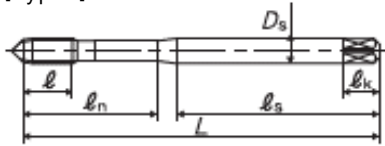
Comparison of the surface edges

Conventional tap (after tapping 7 holes)	MHRZ (after tapping 364 holes)
Significant wear occurred when using conventional taps. MHRZ shows no signs of wear even after tapping 364 holes.	

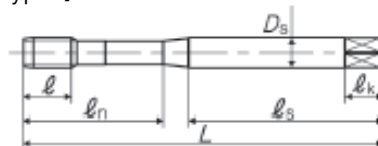
Comparison of the internal thread surface finish

Conventional tap (after tapping 3 holes)	MHRZ (after tapping 364 holes)
After tapping only 3 holes with conventional taps resulted in rough surface finish. After tapping 364 holes with MHRZ taps the surface finish was still excellent.	

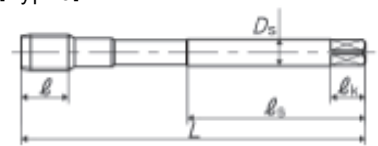
[Type1]



[Type2]



[Type3]



For unified threads

Size	Class	EDP	Chamfer	L (inch)	l (inch)	ln (inch)	ls (inch)	Ds (inch)	Lobe	Type
10-24UNC	H6	387117	4P	2.756	0.354	0.945	1.654	0.194	5	1
10-24UNC	H6	387817	2P	2.756	0.354	0.945	1.654	0.194	5	1
10-32UNF	H6	387121	4P	2.756	0.354	0.945	1.654	0.194	5	1
10-32UNF	H6	387821	2P	2.756	0.354	0.945	1.654	0.194	5	1
1/4-20UNC	H7	387125	4P	3.15	0.433	1.181	1.713	0.255	5	1
1/4-20UNC	H7	387873	2P	3.15	0.433	1.181	1.713	0.255	5	1
1/4-28UNF	H6	387129	4P	3.15	0.433	1.181	1.713	0.255	5	1
1/4-28UNF	H6	387829	2P	3.15	0.433	1.181	1.713	0.255	5	1
5/16-18UNC	H8	387133	4P	3.543	0.472	1.378	1.831	0.318	6	2
5/16-18UNC	H8	387834	2P	3.543	0.472	1.378	1.831	0.318	6	2
5/16-24UNF	H7	387137	4P	3.543	0.472	1.378	1.831	0.318	6	2
5/16-24UNF	H7	387837	2P	3.543	0.472	1.378	1.831	0.318	6	2
3/8-16UNC	H8	387141	4P	3.937	0.512	1.535	2.028	0.381	8	2
3/8-16UNC	H8	387842	2P	3.937	0.512	1.535	2.028	0.381	8	2
3/8-24UNF	H7	387145	4P	3.937	0.512	1.535	2.028	0.381	8	2
3/8-24UNF	H7	387845	2P	3.937	0.512	1.535	2.028	0.381	8	2
7/16-14UNC	H9	387149	4P	3.937	0.512	-	2.008	0.323	8	3
7/16-14UNC	H9	387850	2P	3.937	0.512	-	2.008	0.323	8	3
7/16-20UNF	H8	387153	4P	3.937	0.512	-	2.008	0.323	8	3
7/16-20UNF	H8	387853	2P	3.937	0.512	-	2.008	0.323	8	3
1/2-13UNC	H9	387157	4P	4.331	0.591	-	2.205	0.367	8	3
1/2-13UNC	H9	387858	2P	4.331	0.591	-	2.205	0.367	8	3
1/2-20UNF	H8	387161	4P	4.331	0.591	-	2.205	0.367	8	3
1/2-20UNF	H8	387861	2P	4.331	0.591	-	2.205	0.367	8	3
9/16-12UNC	H10	387158	4P	4.331	0.709	-	2.205	0.429	8	3
9/16-12UNC	H10	387862	2P	4.331	0.709	-	2.205	0.429	8	3
9/16-18UNF	H9	387159	4P	4.331	0.709	-	2.205	0.429	8	3
9/16-18UNF	H9	387863	2P	4.331	0.709	-	2.205	0.429	8	3

The external centers are removed on 1/4" and smaller diameters with 2P chamfer.

Processing data

**MHRZ**

Roll taps for Medium Hardness Carbon Steel



YAMAWA can solve your tapping problem on medium hard carbon and alloy steels.

MHRZ		Tapping condition						Tool life	Tapping result
Size	Material symbol (Hardness)	Hole size (mm)	Tapping length (mm)(*)	Machine	Tapping speed (m/min)	Feed	Tapping fluid	(Holes)	
M6 X 1	SUS316	5.6	9 (1.5D)	CNC	28	Fully synchronous	Oil	10,000	Excellent
M6 X 1	S55CNN	5.55	15 (2.5D)	Machining center	26	Fully synchronous	Water soluble	6,000	Eliminates breakage
M6 X 1	SCM420H	5.55	6 (1D)	Machining center	20	Fully synchronous	Water soluble	2,000	Improved the surface finish of internal threads
M6 X 1	SCM435 (30HRC)	5.55	6 (1D)	Machining center	10	Fully synchronous	Oil	4,800	Excellent
M8 X 1.25	Aluminum alloy casting	7.5	16 (2D)	Machining center	30	Fully synchronous	Water soluble	16,000	Excellent
M10 X 1.5	20Cr (30HRC)	9.4	35 (3.5D)	Machining center	10	Fully synchronous	Oil	860	Eliminates chipping on cutting edge

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



**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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