

Think threads with
YAMAWA

Z-PRO

Ultimate Machining Taps

For North American market

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.



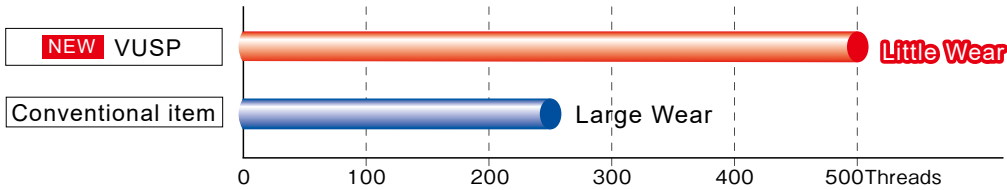
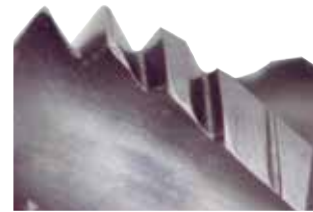
Lubricant	Hole Shape	Tapping Range	Hand Tapping		Drilling Machine		Low Speed		Middle Speed		High Speed			
			 VUSP VUSP 1.5P VUSP CH VUPO											
Water Soluble		Products												
			Water Insoluble		Products	IHT	ISP	SP	ZELX SS SP ZELX NI SP ZELX TI SP					
IPO	PO	ZELX SS PO ZELX NI PO ZELX TI LHSP												

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

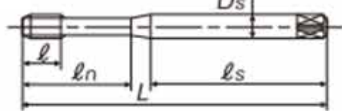
Workpiece Material	Tapping Speed(sfm)
Low Carbon Steels	30~70
Medium Carbon Steels / High Carbon Steels	30~100
Alloy Steels	30~70
Stainless Steels	10~30

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

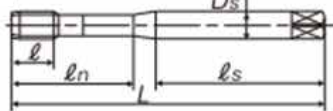
*For smaller diameters, slightly reduce tapping speed.

VUSP

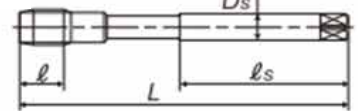
[Type1]



[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	0.197	0.736	1.339	0.141	3	1
M3 X 0.35	D4	394644	2.5P	2.205	0.197	0.736	1.339	0.141	3	1
M4 X 0.7	D5	394617	2.5P	2.48	0.276	0.815	1.535	0.168	3	1
M4 X 0.5	D4	394643	2.5P	2.48	0.197	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	0.709	-	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

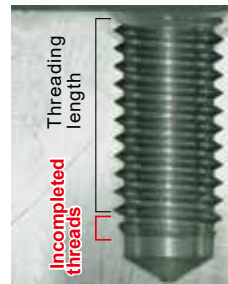
Workpiece Material	Tapping Speed(sfm)
Tools Steels	15~30
Ductile Cast Irons	15~50
Wrought Aluminum	15~70
Aluminum Alloy Castings	15~70

*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



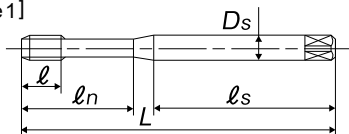
VUSP 1.5P
Internal thread surface



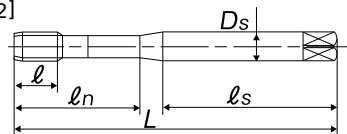
VUSP (chamfer 2.5P)
Internal thread surface

Shape and Dimensions

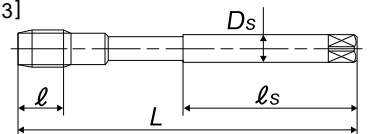
[Type1]



[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

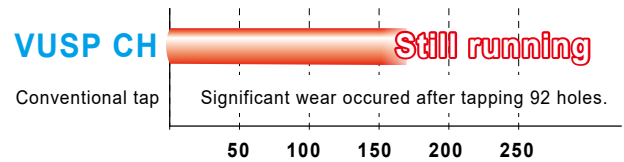


At discharge pressure of 6MPa

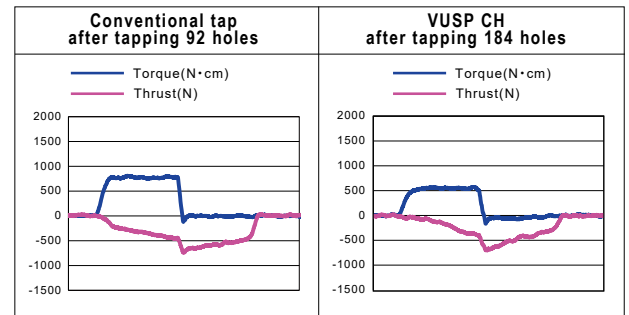


Tapping Data

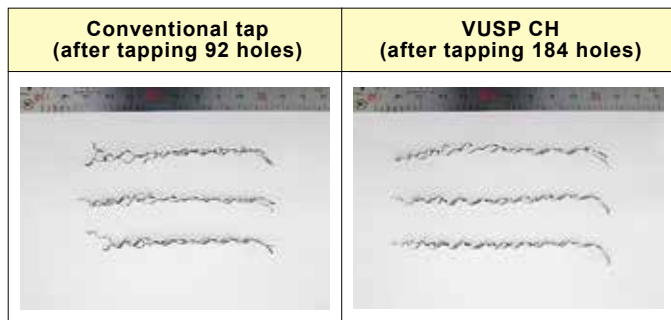
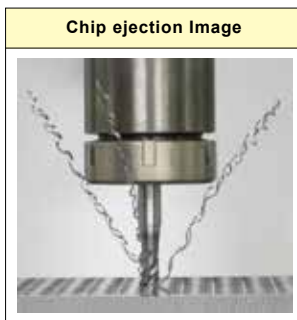
Comparison between Conventional tap and VUSP CH in size 5/16-18UNC. VUSP CH, the coolant through tap offers excellent performance with internal lubrication.



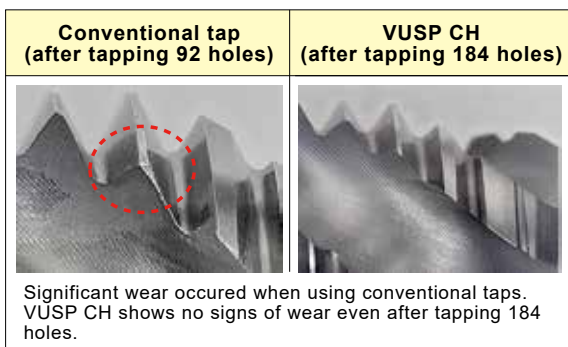
Size	5/16-18UNC
Workpiece Material	4140
Tapping Speed	50sfm
Feed	Synchronous
Bored Hole Size	Φ0.260inch
Tapping Length	0.8inch(2D, blind hole)
Tapping Machine	Vertical Machining Center BT30
Tapping Fluid	Water-soluble tapping fluid FX-30 5%



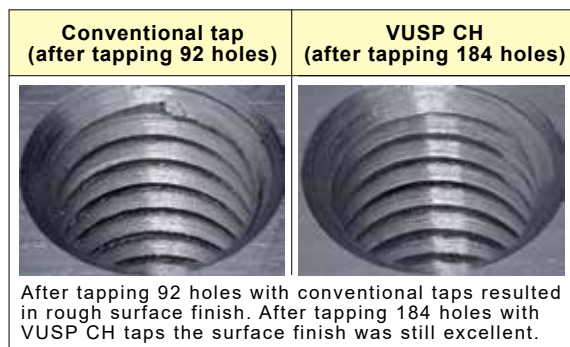
Ejected chips



Comparison of the cutting edges



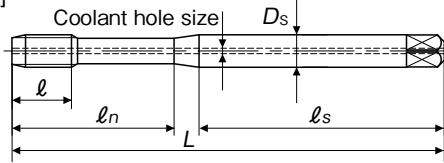
Comparison of the internal thread surface finish



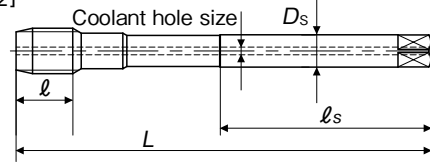
Tapping Data

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

[Type1]



[Type2]



For unified threads

Size	Class	EDP	Chamfer	L (inch)	l (inch)	l _n (inch)	l _s (inch)	D _s (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

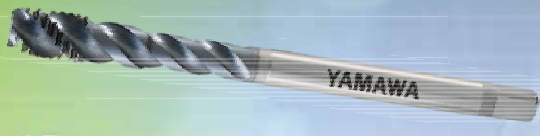
Workpiece Material	Tapping Speed(sfm)
Low Carbon Steels	30~70
Medium Carbon Steels / High Carbon Steels	30~100
Alloy Steels	30~70
Stainless Steels	10~30

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 :



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