Think threads with YAMAWA

HVSP

Z-PRO Hybrid Value Spiral Fluted Taps for steels.

▪ Hybrid Value Spiral Fluted Taps for steels ▪

HVSP

February 2023

ANSI

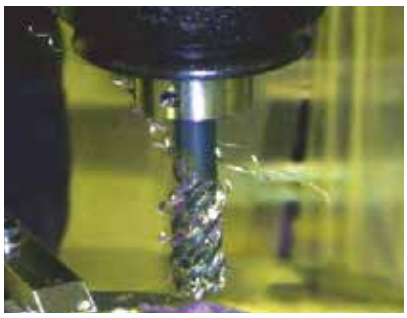
Z-PRO
HVSP

Z-PRO Hybrid Value Spiral Fluted taps for Steels

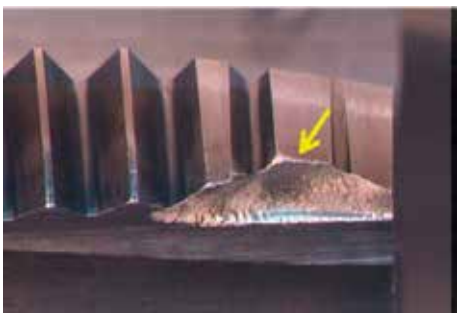
HSS OX 2.5

Soft structual steels such as 1018 and low carbon steels are widely used in larger size tapping.
Large size taps produce a chip that is very large and thick which causes them to be entangled with the spindle and results in the tap chipping.

Ejected chips by large size taps



Entangled chips



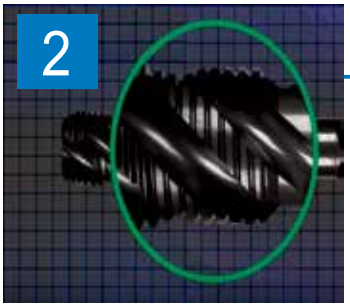
Chipping

HVSP enables stable tapping performance with excellent chip ejection.

Features that prevent chipping issues

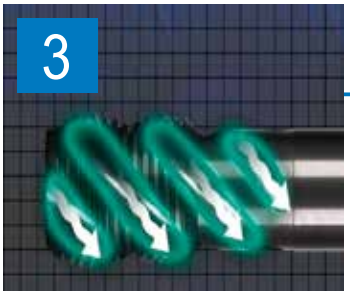
Advanced cutting edge

Specially designed geometry in the cutting edge prevents any chip incursion from the back side of the chamfered thread portion during the reversal of the tap.



BLF shape on full thread portion

The BLF shape improves the heel cut on the tap to produce excellent cutting performance which eliminates the flute chipping issues. This prevents the chips from clogging on the full threaded portion of the tap.



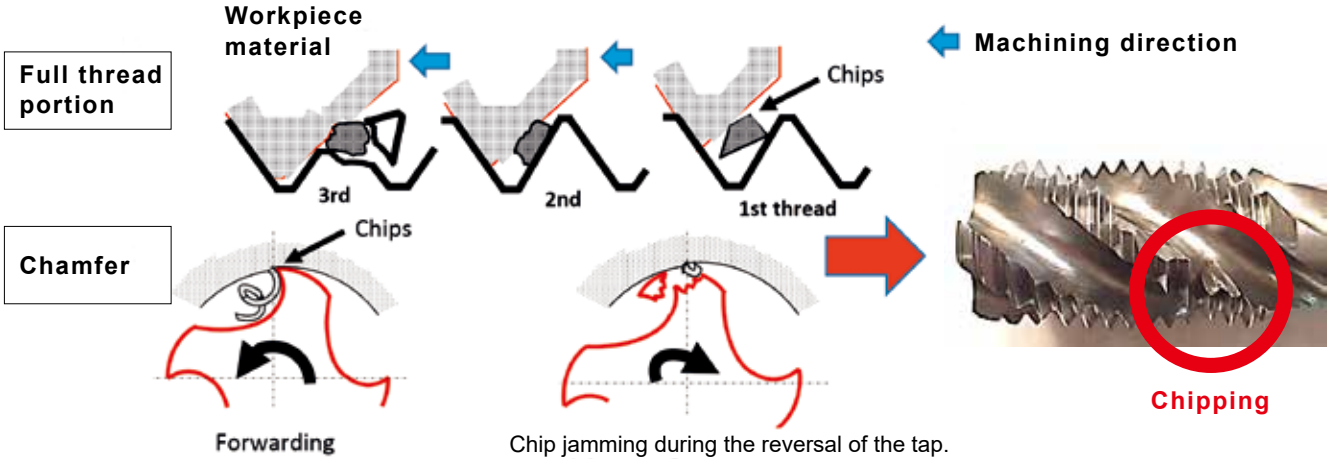
Unique flute design

Unique flute design for smooth chip ejection.

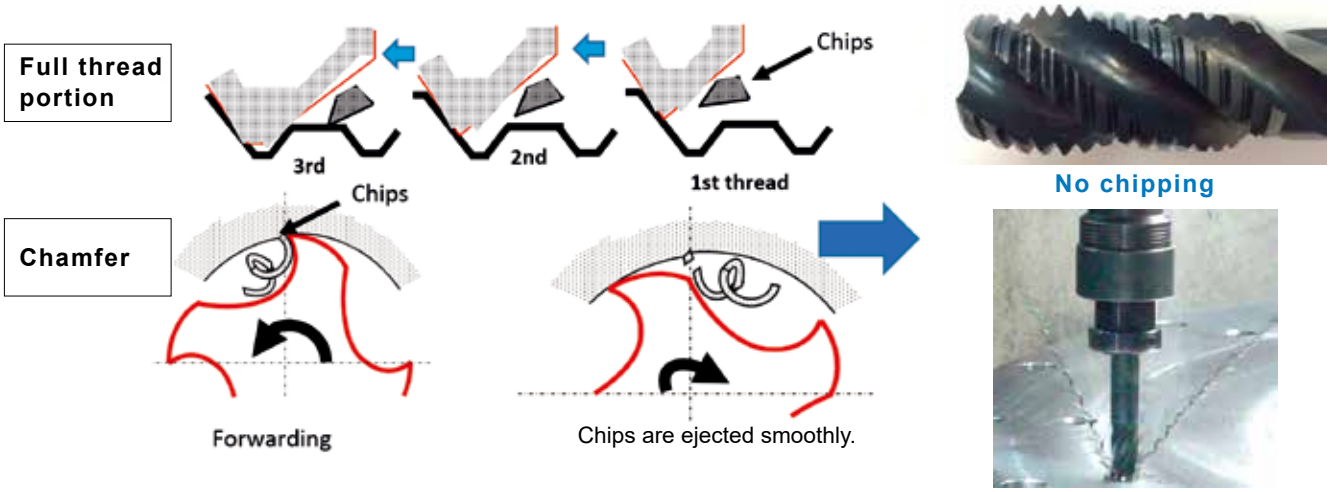
Prevention of chip jamming ensured by improved thread portion

The full threaded portion of the HVSP is specially designed to have the first 3 threads at full height and the balance of threads at the pitch diameter height. By adopting this unique design the "BLF", HVSP maximizes a smooth chip ejection.

<Tapping with a conventional tap> Chipping happens on the thread portion



<Tapping with HVSP> No chipping



Combination with straight oil

Large diameter taps are more effective with an oxidation treatment as this helps the oil to stay on the flutes while tapping.
Chip welding causes a galling affect on the tapped thread surface.
Using non-water soluble cutting oil adds lubricity to the tapping operation and helps with welding problems on the thread portion on the tap.

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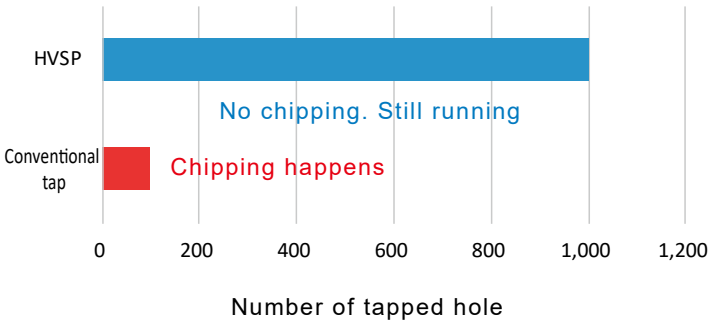
Recommended tapping condition

For both synchronous and asynchronous feed

Workpiece materials		Recommended tapping speed(sfm)		
		M3~M5	M6~M16	M18~M48、U1~U2
Low Carbon Steels	~1018/1020	10~30	10~40	10~25
Medium Carbon Steels	1025~1045	10~30	10~40	10~25
High Carbon Steels	1045~	10~30	10~40	10~25
Alloy Steels	SCM/SCr	10~30	10~40	10~25
Thermal Refined Steels	25~35HRC	10~30	10~40	10~25
Cast Steels	SC	10~30	10~40	10~25
Stainless Steels	303/304	~15	~15	~15

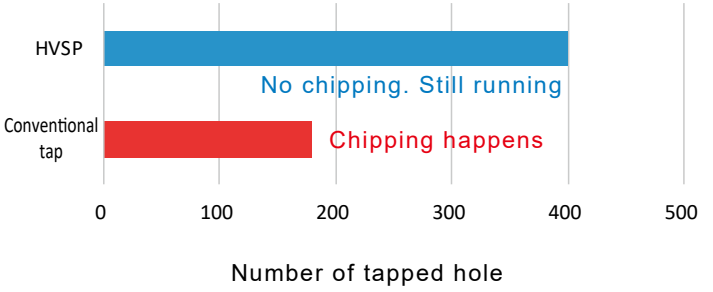
Tapping data

Case 1. Comparison with a conventional tap



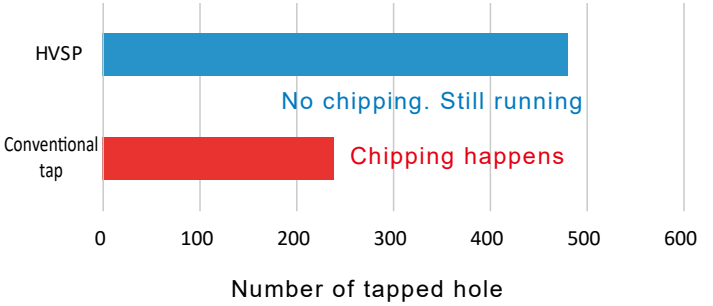
Item	HVSP M16X2
	Conventional tap M16X2
Workpiece material	1018
Tapping length	Blind hole 1.65inch
Direction	Holizontal
Bored hole dia. (mm)	0.56inch
Machine	Special machine (Non rigid)
Cutting speed (m/min)	25sfm
Lubrication	Straight oil

Case 2. Comparison with a conventional tap



Item	HVSP M30X3.5
	Conventional tap M30X3.5
Workpiece material	4120
Tapping length	Blind hole 2.36inch
Direction	Holizontal
Bored hole dia. (mm)	1.04inch
Machine	Machining Center (Non rigid)
Cutting speed (m/min)	15sfm
Lubrication	Straight oil

Case 3. Comparison with a conventional tap

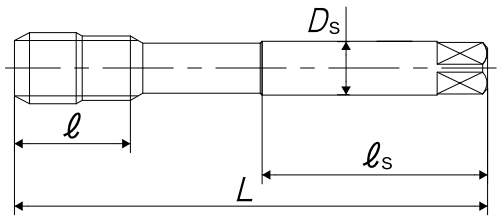


Item	HVSP M36X4
	Conventional tap M36X4
Workpiece material	1060
Tapping length	Blind hole 3.54inch
Direction	Vertical
Bored hole dia. (mm)	1.28inch
Machine	Drilling machine (Non rigid)
Cutting speed (m/min)	15sfm
Lubrication	Straight oil

Dimension and Sizes

<For Unified Threads>

[1-8UNC~
2-8UN]



Chamfer length:2.5P

Unit:inch

Size	Class	Product code	L (inch)	ℓ (inch)	ℓs (inch)	Ds (inch)	No. of flutes	Minor diameter of 2B internal threads		Recommended bored hole size
								Max.	Min.	
1-8UNC	2BX	SSU16XYEEXCJ	6.299	1.457	3.228	0.800	4	0.890	0.865	ø0.884
1-12UNF	2BX	SSU16SYEEXCJ	6.299	1.457	3.228	0.800	4	0.928	0.910	ø0.924
1 1/8-7UNC	2BX	SSU18YYEEXCJ	7.087	1.732	3.622	0.896	4	0.998	0.970	ø0.991
1 1/8-8UN	2BX	SSU18XYEEXCJ	7.087	1.732	3.622	0.896	4	1.015	0.990	ø1.009
1 1/8-12UNF	2BX	SSU18SYEEXCJ	7.087	1.732	3.622	0.896	4	1.053	1.035	ø1.049
1 1/4-7UNC	2BX	SSU20YYEEXCJ	7.087	1.929	3.622	1.021	4	1.123	1.095	ø1.116
1 1/4-8UN	2BX	SSU20XYEEXCJ	7.087	1.929	3.622	1.021	4	1.140	1.115	ø1.134
1 1/4-12UNF	2BX	SSU20SYEEXCJ	7.087	1.929	3.622	1.021	4	1.178	1.160	ø1.174
1 3/8-6UNC	2BX	SSU22ZYEEXCJ	7.874	2.165	4.016	1.108	4	1.225	1.195	ø1.218
1 3/8-8UN	2BX	SSU22XYEEXCJ	7.874	2.165	4.016	1.108	4	1.265	1.240	ø1.259
1 3/8-12UNF	2BX	SSU22SYEEXCJ	7.874	2.165	4.016	1.108	4	1.303	1.285	ø1.299
1 1/2-6UNC	2BX	SSU24ZYEEXCJ	7.874	2.323	4.016	1.233	4	1.350	1.320	ø1.343
1 1/2-8UN	2BX	SSU24XYEEXCJ	7.874	2.323	4.016	1.233	4	1.390	1.365	ø1.384
1 1/2-12UNF	2BX	SSU24SYEEXCJ	7.874	2.323	4.016	1.233	4	1.428	1.410	ø1.424
1 3/4-5UNC	2BX	SSU280YEEXCJ	8.661	2.559	4.409	1.430	4	1.567	1.533	ø1.559
1 3/4-8UN	2BX	SSU28XYEEXCJ	8.661	2.559	4.409	1.430	4	1.640	1.615	ø1.634
1 3/4-12UN	2BX	SSU28SYEEXCJ	8.661	2.559	4.409	1.430	4	1.678	1.660	ø1.674
2-4 1/2UNC	2BX	SSU329YEEXCJ	9.843	2.874	5.039	1.644	4	1.795	1.759	ø1.786
2-8UN	2BX	SSU32XYEEXCJ	9.843	2.874	5.039	1.644	4	1.890	1.865	ø1.884

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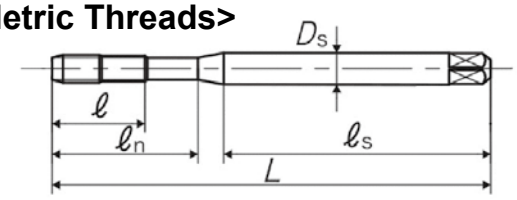
Dimension and Sizes

<For Metric Threads>

[Type:1]



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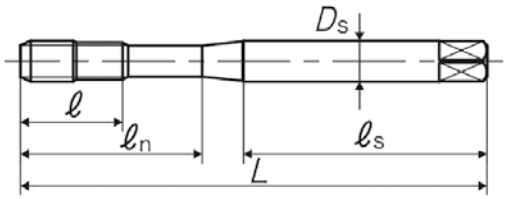

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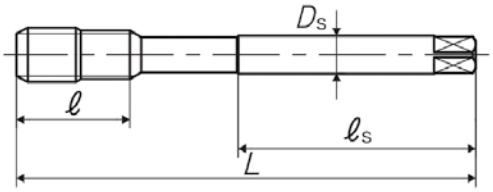

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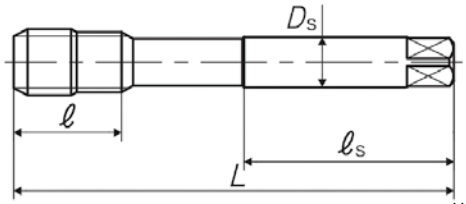

Chamfer length:2.5P

Unit:inch

Size	Class	Product code	L	ℓ	ℓn	ℓs	Ds	No. of flutes	TYPE	Recommended bored hole size
M3X0.5	D4	SS3.0G4EEXJ	2.205	0.433	0.736	1.358	0.141	3	1	ø0.1009
M3X0.35	D4	SS3.0D4EEXJ	2.205	0.256	0.736	1.358	0.141	3	1	ø0.1061
M4X0.7	D5	SS4.0I5EEXJ	2.480	0.512	0.815	1.535	0.168	3	1	ø0.1330
M4X0.5	D4	SS4.0G4EEXJ	2.480	0.354	0.815	1.535	0.168	3	1	ø0.1403
M5X0.8	D5	SS5.0K5EEXJ	2.756	0.551	0.984	1.654	0.194	3	1	ø0.1687
M5X0.5	D4	SS5.0G4EEXJ	2.756	0.354	0.984	1.654	0.194	3	1	ø0.1797
M6X1	D6	SS6.0M6EEXJ	3.150	0.591	1.181	1.713	0.255	3	1	ø0.2005
M6X0.75	D6	SS6.0J6EEXJ	3.150	0.591	1.181	1.713	0.255	3	1	ø0.2099
M6X0.5	D4	SS6.0G4EEXJ	3.150	0.354	1.181	1.713	0.255	3	1	ø0.2191
M8X1.25	D7	SS8.0N7EEXJ	3.543	0.748	1.378	1.831	0.318	3	2	ø0.2695
M8X1	D6	SS8.0M6EEXJ	3.543	0.748	1.378	1.831	0.318	3	2	ø0.2793
M10X1.5	D8	SS010O8EEXJ	3.937	0.906	1.535	2.126	0.381	3	2	ø0.3386
M10X1.25	D7	SS010N7EEXJ	3.937	0.906	1.535	2.126	0.381	3	2	ø0.3483
M10X1	D6	SS010M6EEXJ	3.937	0.906	1.535	2.126	0.381	3	2	ø0.3580
M12X1.75	D8	SS012P8EEXJ	4.331	1.024	-	2.205	0.367	3	3	ø0.4078
M12X1.5	D7	SS012O7EEXJ	4.331	1.024	-	2.205	0.367	3	3	ø0.4174
M12X1.25	D7	SS012N7EEXJ	4.331	1.024	-	2.205	0.367	3	3	ø0.4270
M14X2	D9	SS014Q9EEXJ	4.331	1.024	-	2.205	0.429	3	3	ø0.4770
M14X1.5	D8	SS014O8EEXJ	4.331	1.024	-	2.205	0.429	3	3	ø0.4961
M16X2	D9	SS016Q9EEXJ	4.331	1.024	-	2.205	0.480	3	3	ø0.5558
M16X1.5	D8	SS016O8EEXJ	4.331	1.024	-	2.205	0.480	3	3	ø0.5748
M18X2.5	D9	SS018R9EEXJ	4.921	1.299	-	2.520	0.542	4	3	ø0.6154
M18X1.5	D8	SS018O8EEXJ	4.921	0.945	-	2.520	0.542	4	3	ø0.6536
M20X2.5	D9	SS020R9EEXJ	5.512	1.299	-	2.795	0.652	4	3	ø0.6942
M20X1.5	D8	SS020O8EEXJ	5.512	0.945	-	2.795	0.652	4	3	ø0.7323
M22X2.5	D9	SS022R9EEXJ	5.512	1.299	-	2.795	0.697	4	3	ø0.7729
M22X1.5	D8	SS022O8EEXJ	5.512	0.945	-	2.795	0.697	4	3	ø0.8111
M24X3	D9	SS024S9EEXJ	6.299	1.457	-	3.228	0.760	4	4	ø0.8318
M24X1.5	D8	SS024O8EEXJ	6.299	1.063	-	3.228	0.760	4	4	ø0.8898
M27X3	D10	SS027SOEEXJ	7.087	1.732	-	3.622	0.896	4	4	ø0.9499
M27X1.5	D8	SS027O8EEXJ	7.087	1.063	-	3.622	0.896	4	4	ø1.0079
M30X3.5	D10	SS030TOEEXJ	7.087	1.732	-	3.622	1.021	4	4	ø1.0485
M30X3	D10	SS030SOEEXJ	7.087	1.732	-	3.622	1.021	4	4	ø1.0669
M30X1.5	D8	SS030O8EEXJ	7.087	1.063	-	3.622	1.021	4	4	ø1.1260
M33X3.5	D10	SS033TOEEXJ	7.087	1.732	-	3.622	1.108	4	4	ø1.1666
M33X3	D10	SS033SOEEXJ	7.087	1.732	-	3.622	1.108	4	4	ø1.1850
M36X4	D10	SS036UOEEXJ	7.874	2.047	-	4.016	1.233	4	4	ø1.2646
M36X3	D10	SS036SOEEXJ	7.874	2.047	-	4.016	1.233	4	4	ø1.3042
M39X4	D10	SS039UOEEXJ	7.874	2.047	-	4.016	1.305	4	4	ø1.3827
M39X3	D10	SS039SOEEXJ	7.874	2.047	-	4.016	1.305	4	4	ø1.4223
M42X4.5	D10	SS042VOEEXJ	7.874	2.047	-	4.016	1.430	4	4	ø1.4816
M42X3	D10	SS042SOEEXJ	7.874	2.047	-	4.016	1.430	4	4	ø1.5394
M48X5	D11	SS048W-EEXJ	9.843	2.559	-	5.039	1.644	4	4	ø1.6976
M48X3	D10	SS048SOEEXJ	9.843	2.559	-	5.039	1.644	4	4	ø1.7767

ISO 9001
JQA-QMA14664

ISO 14001
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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