

No. 141

# Tapping for stainless steels by YAMAWA HVSP

## 【Consulation】



We purchased the new HVSP P3 M3X0.5 from Yamawa after looking at the tool shop's website. When I actually try to process SCM material and S50C, I can process them very well. However, when machining stainless steel under similar conditions, the tool sometimes breaks. What could be the cause? Size: M3X0.5 Thread length: 6mm Machining conditions: MC, fixed holder, Vc = 8 m/min, water-soluble cutting fluid diluted 20 times

## 【Answer】

HVSP is also not a universal product that fits all machining conditions. There are machining conditions that suit the material to be machined, so please pay attention to the tapping speed and test again.



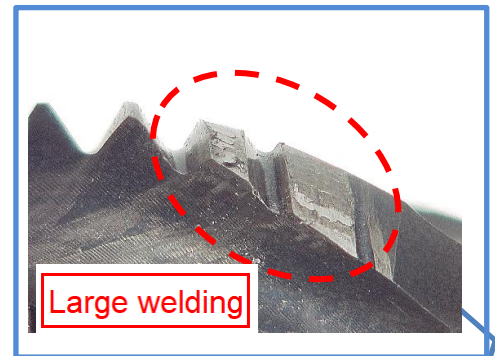
**【Description】** HVSP requires adjustment of tapping speed depending on the material to be processed. Reference processing conditions are as follows.

## 【Reference tapping speed】

Workpiece material	Recommended tapping speed (m/min)		
	M3~M5	M6~M16	M18~M48、U1~2
Low carbon steels ~S20C/SS400	3~9	3~12	3~8
Medium carbon steels S25C~S45C	3~9	3~12	3~8
High carbon steels S45C~	3~9	3~12	3~8
Alloy steels SCM/SCr	3~9	3~12	3~8
Stainless steels SUS303/304	~5	~5	~5

**【Test condition】** Tests were conducted at actual out-of-area tapping speeds.

Product	HVSP P3 M3X0.5	
Workpiece material	SUS304	
Cutting speed	Vc=5m/min (within recommendation)	Vc=8m/min (out of recommendation)
Threading length	6mm(2D), Blind hole	
Bored hole dia.	2.5mm	
Machine	Brother SPEEDIO S500X2	
Feed / Holder	Synchronized / Fixed	
Lubrication	Water soluble oil(FX-30, Dilution ratio 20 times) Outside coolant	
No. of tapped holes	More than 10 holes produced	Breakage after 2 holes produced



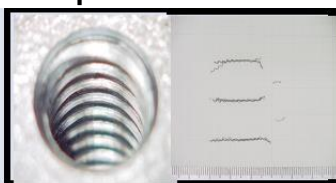
The area surrounded by the red dotted line shows welding on the clearance surface of the tap (inside the red dotted line). The springback of the work material is also thought to be a factor.

With metals with low thermal conductivity, such as stainless steel, cutting heat tends to rise when machining speed is increased. Also, the high affinity with HSSE taps causes welding to occur! It is thought that the welding that occurs on the relief surface of the tap increases the machining load on the tap and leads to breakage! Therefore, when machining stainless steel, it is necessary to pay attention to the difference in machining speed from other materials to be machined.

## 【Advice】



HVSP performs excellent at low-speed processing♪



[Internal thread · Chip shape]

Tapping peed: 5m/min

For machining with water-soluble cutting fluids, we recommend VUSP/VUPO♪

