

## 【Consultation】



We are roll tapping a M6X1 thread in SS400 material. The minor diameter of the internal thread was created by the roll tap. The minor diameter seems to be different depending on the material being processed and the shape of the processed material. We have checked the Yamawa catalog for a guide to get the minor diameter information but the diameter seems to vary in different circumstances. Can you please tell me if there is a good way to find the optimum hole diameter?

## 【Answer】

You should machine the minor diameter of the thread based on the Roll Tap Drilled Hole Diameter as described in the Yamawa catalog. To determine the optimum lower limit diameter, measure the actual pilot hole diameter and the finished internal thread minor diameter. Calculation formulas and examples are described below, so please refer and try it.



## 【Explanation】

The optimum pilot hole diameter can be roughly calculated by the following formula.

$$\text{Optimum hole diameter} = \frac{\text{Optimum Hole Diameter} - \text{Current Minor diameter} - \text{Target Minor Diameter}}{2}$$

※ Try a simple calculation using "Photo M6X1" below as an example.

When the target finishing minor diameter is  $\phi 5.05$  with a 87% of height.

1. ① When the current hole diameter is  $\phi 5.61$  and you want to reach a  $\phi 5.17$  minor diameter, the Optimum hole diameter =  $5.61 - (5.17 - 5.05) \div 2 = 5.55$ .
2. ② When the current hole diameter is  $\phi 5.42$ , and you want to reach  $\phi 4.79$ , the Optimum hole diameter =  $5.42 - (4.79 - 5.05) \div 2 = 5.29$ .

※ Since B is the optimum pilot hole diameter, the minor diameter also matches the target value.



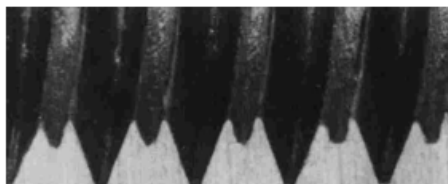
To check the minor diameter prior to roll tapping, please use the Check Pin Gauge CPC-S for a cutting tap.



**Comparative example (roll tap grade G7 M 6 X 1)**  
(6 H internal thread minor diameter:  
Max 5.153 mm to Min 4.917 mm)

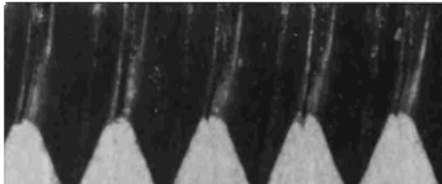
6 HPP-NO GO: 6H class bore NG plug gauge  
6 HPP-GO: 6H class minor diameter GO plug gauge

① Pilot hole diameter:  $\phi 5.61$   
processing internal thread.



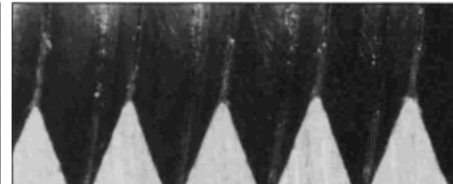
Minor diameter:  $\phi 5.17$  with a 77% thread height ratio 6 HPP - NG (near 6 H class inner diameter maximum) Pilot hole diameter is slightly larger than optimum pilot hole diameter. There is a lack of material movement.

② Pilot hole diameter:  $\phi 5.55$   
processing internal thread.



Minor diameter:  $\phi 5.05$  with a 87% thread height ratio: 87% material is deformed cleanly. 6 HPP - NoGo is OK - 6 HPP.

③ Pilot hole diameter:  $\phi 5.42$   
processing internal thread.



Minor diameter:  $\phi 4.79$  with a 112% thread height ratio: 6 HPP - NG (outside 6 H class bore size standard) Pilot hole diameter is smaller than optimum bore diameter. Excessive excitement.