

No.128

Proposal for using an Incremental (Serial) Tap

Cutting Tap

【Consultation】



"Hand tap M30 x 3.5" is being processed with a drilling machine, but the machine inevitably stops along the way. Even I use Plug taps and Bottoming taps, the processing stops. I suspect that the machine's horsepower is low. Is there a safe way to proceed?

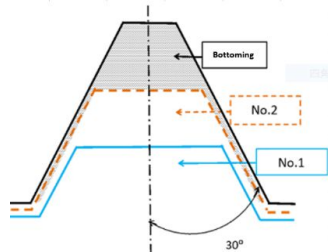
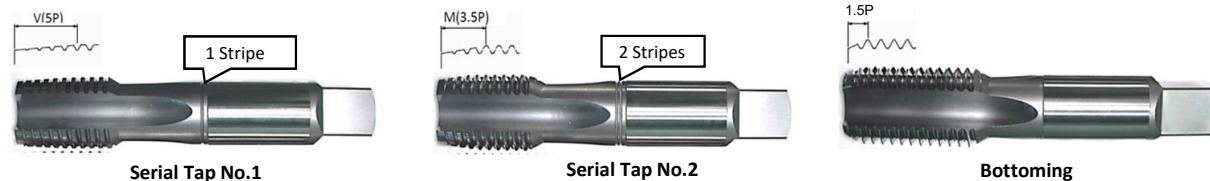
【Answer】

The cause of machine stoppage is that the mechanical power is small. As a countermeasure, there is a method of processing with a "serial tap". The basic approach with serial tap is to divide the screw threads into three sections and process it three times. However, even with the combination of the serial tap and a standard tap, the machining torque may still be low, making it a potential solution.



【Explanation】

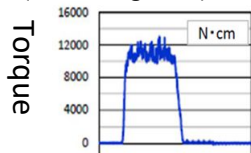
Thread shape and chamfer length of each taps



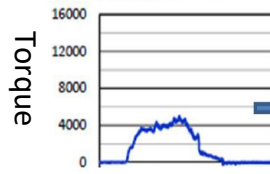
As shown in the photo above, the serial tap is similar in shape to a standard hand tap, but the height of the screw thread's crest increases in three steps, as illustrated in the left diagram.

The torque curve shown below compares the machining torque when cutting SS400 material with an M30x3.5 thread at a cutting speed of 6 m/min. As you can see, the machining torque of the serial tap is less than half that of the standard Hand tap.

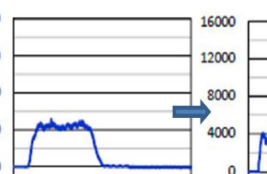
Machining torque for standard HT (Bottoming: 1.5P)



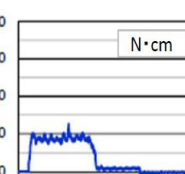
- Machining torque for Serial Hand Tap (three-piece set)
- Serial Hand Tap No. 1 (Chamfer V : 5P)



- Serial Hand Tap No. 2 (Chamfer M : 3.5P)



- Bottoming (Chamfer: 1.5P)



< Methods for aligning the cutting edges of taps >

When using serial tap No. 2 or a bottoming tap, attach the tap to the machine. Lightly apply the chamfer of the tap to the internal thread by hand to initiate alignment. Align the cutting edges of the tap with the thread and manually adjust the direction of the thread. Turn the tap and machine it until it stops turning. Then proceed with the machining process.

