

No.004

Solve tap breakage problems by using Roll Taps

Roll taps

【Question】

We are doing tapping, mostly M2.6x0.45 and smaller, but are concerned about tap breakage problems. Is there any way to improve the situation ?

【Answer】

Why don't you try tapping without producing chips with roll taps? There is a big chance to greatly reduce the breakage problem.

This time I would like to explain an example where the tap's breakage problems were greatly reduced by changing the cutting tap into a roll tap. Before, the customer had many tap breakage issues while tapping smaller size threads in stainless steel material with cutting taps.

【Improvement】

【Tapping condition when Yamawa had received the complaint.】

Tap : SP P1 M2X0.4
 Work material : SUS304
 Hole diameter : $\phi 1.6$
 Feed : Full rigid
 Holder : Fixing
 Tapping speed : 3.2m/min(500min⁻¹)
 Tapping fluid : Water soluble oil (X20)



Condition of tap breakage



【Used roll tap after improvement and tapping with the roll tap】

Tap : HP+RZ G4 M2X0.4
 Work material : SUS304
 Hole diameter : $\phi 1.81$
 Feed : Full rigid
 Holder : Fixing
 Tapping speed : 10m/min(1600min⁻¹)
 Tapping fluid : Water soluble oil



Condition of good internal threads

Cutting threads with a Spiral fluted tap had chip clogging problems and broken the tap. On the other hand, with no chips produced by the roll tap it has been creating clean internal threads, hasn't it ?

【Advice】

Spiral fluted taps (SP) cut internal threads while ejecting chips back out of the bore. This can cause breakage problems due to clogged chips shown in Drawing -1.

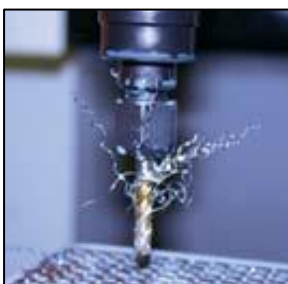
Since roll taps produce internal threads through material deformation and create no chips, they do not have a problem caused by chips.

As you can see by comparing Drawing-2 with Drawing-4, the roll tap has a large core diameter and has higher strength than the cutting tap has.

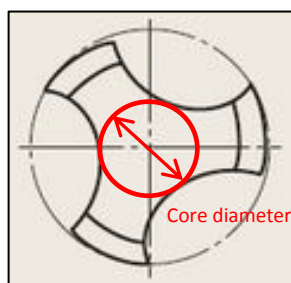
This is the reason why roll taps don't have problems even by increasing the tapping speed by 3 times higher, isn't it?

Yes, I think you should use roll taps as much as possible in smaller size tappings.

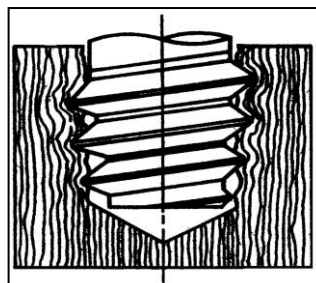
Drawing-1
Chip clogging in a spiral fluted tap



Drawing-2
Flute's cross section and core diameter of the cutting tap



Drawing-3
Tapping with the roll tap



Drawing-4
Flute's cross section and core diameter of the roll tap

