Think threads with YAMAWA

No.062

The coolant filtration and discharge pressure

Cutting tap

【Consultation】

I plan to purchase a CNC machining center in the near future and use taps with coolant holes. Is there anything I should be aware of when using taps with coolant holes?

【Answer】

The basic precautions are the same as when using normal taps, but in order to fully achieve the performance of taps with coolant holes, it is important to configure the processing environment of the machine to be used. Among the issues to look for are the filtration filter and the coolant discharge pressure. For details, please refer to the explanation below.

【Description】

The coolant filtration filter:

- When using a tap with coolant holes, always maintain a high degree of filtration of the coolant to insure the removal of any dust or chips. Please check whether the mesh of the filter built into the CNC machine is appropriate.
- When sludge or fine chips are stuck in the coolant holes of the tap, the holes become clogged and the coolant volume exhaust will become poor.

The amount of coolant supply decreases when the tap's coolant holes are blocked and in the worst case a tap breakage problem may develop.

1. The filtration of the coolant needs to be "20 μm to 50 μm" when using a tap with coolant holes.
2. The filtration of the coolant is determined by the accuracy of the filters installed in the coolant tank. In addition, regular maintenance of the coolant filters becomes an important issue to prevent the flow rate and discharge pressure from decreasing.

- We propose you confirm the filter accuracy and the periodic replacement frequency of the planned purchased CNC machine in advance.

* When the filtration level exceeds "100 μm", there is a possibility of clogging problems of the tap's coolant holes. We propose a specific timely interval changing of the coolant filters to maintain the filtration accurarcy.

<Discharge pressure of coolant:>

- Please verify if the coolant pump can supply enough coolant to the cutting edge chamfer of the tap or if the coolant pressure is needed to forcibly discharge the chips. It may be necessary to add more coolant pressure based on the tapping conditions.
- We think the higher coolant discharge pressure is more effective. Please keep in mind, the general pressure resistance limit of a standard tapping holder is around "6.5 MPa ~ 7 MPa".
- Normally, the coolant discharge pressure of a CNC machine is selected as an optional setting at the time of purchase. In general, around 1.5 MPa is the basic machine coolant pump specification for a standard CNC machine and around 3 MPa for a high coolant pressure specification. Around 7 MPa is considered a super high coolant pressure specification.

1. The coolant discharge pressure when using a tap with coolant holes is commonly around "1.5MPa ~ 3MPa".
2. In case problems are caused from the discharging of the chips, we will suggest an examination of the coolant discharge pressure and an examination of flute torsion specification of the HT, SP, PO or inverse SP taps being used.