No. 107

Pilot hole for tapered pipe thread tapping-2

Pipe Tap

【Consultation】

When processing a Rc (PT) internal taper thread with a taper pipe tap, I heard it would be easier to tap the taper of the pilot hole with the tap. Why is it easier? Also, is there a problem when tapering the pilot hole with the tap? Currently, I'm tapping into a straight hole with a PT 1-11, but I think that would like to try using a taper hole if processing is made easier.

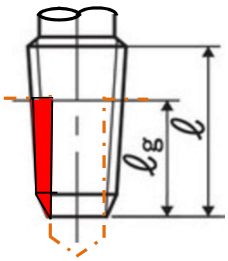
【Answer】

When processing a PT internal tapered thread with a taper pipe tap, a straight pilot hole is usually processed but if the pilot hole has a specified tapered shape, the volume of chips discharged will be reduced when cutting. I think some problems caused by chips can be solved this way. In addition, the total processing load amount on the tap is reduced when tapping into a tapered pilot hole, which leads to improvement in the tool life of the tap. If the pilot hole is tapered, the cutting chamfer section of the tap will not contact the pilot hole so, it will not be possible to tap unless it is done on a synchronized feed machine. Please refer to the following explanation below.

【Guide-1】

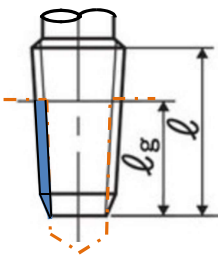
When processing a PT 1-11 internal taper thread and the pilot hole is tapered from straight with a long thread type taper pipe tap where lg = 32, the total processing amount of the tap decreases by “about 21%”.

1. Straight pilot hole shape:



Base pilot hole.
Drilled diameter: φ29
Machining depth (ℓg): 32 mm.
Total machining amount of tap about 2,800mm^3

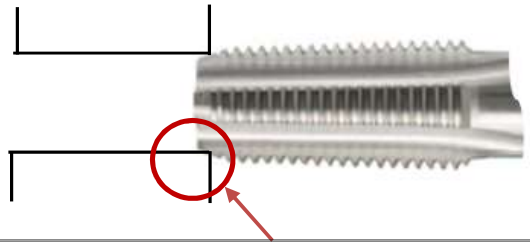
2. Taper pilot hole shape:



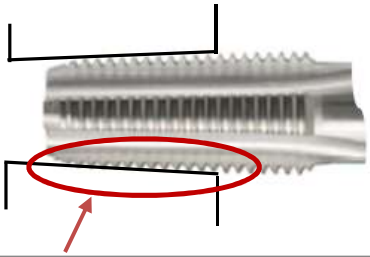
Pilot hole diameter:
φ29 Pilot hole.
Large end diameter: φ30.291 drill and reamer finish.
Machining depth (ℓg): 32 mm.
Total machining amount of tap approximately 2,200mm^3

【Guide-2】

When the pilot hole is straight, the PT taps chamfer starts the cut but when the pilot hole is tapered, the entire top of the full thread cuts into the taper pilot hole all at once.



When the pilot hole is straight, the thread cutting starts with the taps cutting chamfer section, so the thrust is applied correctly to the PT tap enabling tapping on non-synchronous machines such as radial drilling machines.



If the pilot hole is tapered, the tap starts cutting with it's entire outside diameter as it contacts the pilot hole. When contacting the pilot hole, the entire taper thread cuts into the workpiece at the same time. As a result, the taps thrust does not contact the cutting chamfer of the PT taps, so it can not be machined on asynchronous machines such as radial drilling machines. It will be necessary to process with a synchronous feed machine.