

**【Consultation】**



Can you give me some advise for machining a Rc (PT) 1/4-19 tapered internal thread with a threading length of 8.7 mm? I am machining with a carbide helical cutter 080153 X 19 R. I got good results using a tapered pilot hole. Could you tell me the reason for recommending the taper hole when processing a Rc (PT) 1/4-19 R? I would like to put this in my processing manual.

**【Answer】**

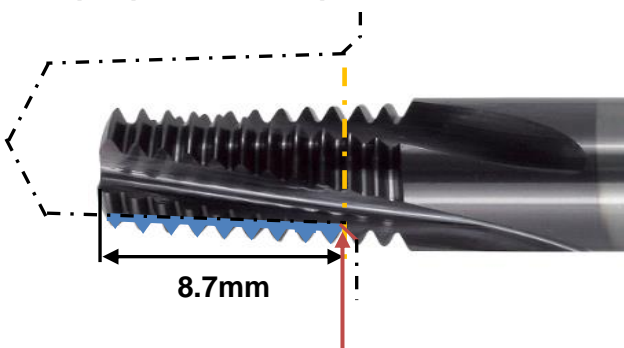
When processing a Rc 1/4-19 taper thread with a taper pipe taps you gradually start cutting the thread with the cutting chamfer end of the tap at the smallest diameter. The tap continues cutting the complete taper thread until the tap reaches the tapered reference diameter position where the diameter becomes the largest.

When using a helical cutter #080153X19R, it is possible but not recommended to process a tapered thread with a straight pilot hole. However, the cutter processes all the threads from the bottom of the thread to the inlet of the hole where the tapered diameter becomes largest in a single rotation around the diameter of the threaded hole . If you use a tapered helical cutter in a straight hole, the extra cutting load may chip the cutter, please see below.



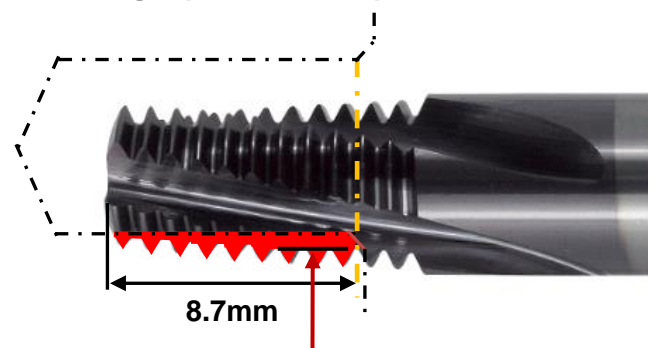
**【Description】**

**1. Taper pilot hole shape:**



**Difference between thread height and pilot holes of helical cutter: about 0 mm**

**2. Straight pilot hole shape**



**Difference between thread height and pilot hole of helical cutter: about 0.27 mm**

1. The above images compare the amount of material removed by the helical cutter when the shape of the pilot hole is straight or tapered.
2. If the pilot hole is tapered as in figure 1, the thread height of the tapered helical cutter is uniformly processed from the bottom of the pilot hole to the inlet of the internal thread. The blue portion is the image of the metal removal amount. An unreasonable amount of load is not added.
3. However, when the pilot hole is straight as shown in figure 2, an excessive load is applied to the tapered helical cutters threads. The thread height of the tapered helical cutter takes a larger amount of material at the inlet than at the bottom of the pilot hole. The red portion is the image of the metal removal amount. It is more likely to cause chattering or chipping of the cutting edge.

In processing a taper thread with a taper helical cutter, the ease of processing and the absence of problems will greatly change depending on how the bore diameter is finished. If you understand the reason, you will want to check the results and adjust the notations in your operating manual.

