

【Consultation】



We are processing a Rc (PT) 1/4-19 Taper Internal Thread that has a thread length of 8.7mm. We are using a helical cutter 080153 X 19R. The pilot hole is straight and needs to be tapered. I have heard a tapered hole will improve the tool life of a Rc helical cutter. How can I machine the pilot hole into a taper?

【Answer】

First, machine the straight pilot hole to a $\phi 10.9$ diameter.

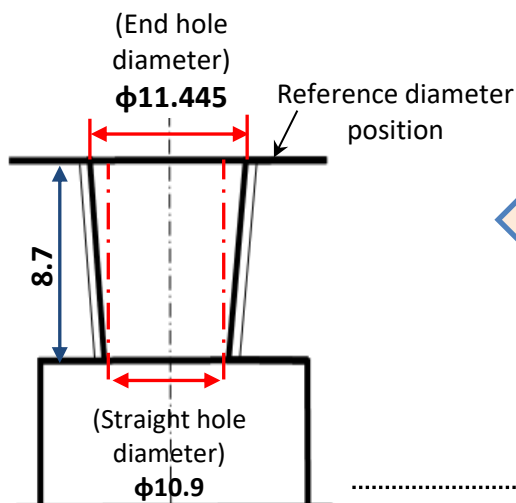
Next, use a 1/16 taper drill or tapered reamer in the straight pilot hole so that the hole diameter on the large end face does not exceed $\phi 11.445$. If your Rc it is not a through hole, there are cases where a commercially available 1/16 taper drill or taper reamer cannot be used, as the drill or reamer must exit the hole. In that case, we recommend the use of a taper end mill with a 2° inclination angle.



Note: The inside reference diameter value of the Rc (PT) 1/4-19 is $\phi 11.445$.

【Description】

Rc (PT) 1/4-19 Taper Hole Shape



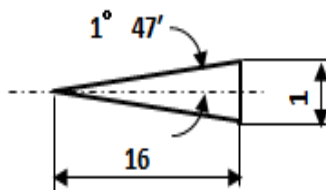
Straight hole diameter and tapered end diameter of the pilot hole

Unit mm

SIZE	Straight hole diameter (reference)	End diameter of tapered hole (Reference)
Rc 1/8-28	8.2	8.566
Rc 1/4-19	10.9	11.445
Rc 3/8-19	14.4	14.950
Rc 1/2-14	17.9	18.631
Rc 3/4-14	23.3	24.117
Rc 1 - 11	29.3	30.291
Rc 1 1/4-11	37.9	38.952
Rc 1 1/2-11	43.8	44.845
Rc 2 - 11	55.4	56.656

【Advice】

- There may be cases where only Rc 1/4-19 or PT1/4-19 is the description on the drawing. The JIS standard includes the effective minimum screw length specification, see the table on the right. If there is no specification on the drawing, it may be advantageous to shorten the tapping length to correspond with the minimum length specification.
- The taper of the threads for pipe is a "1/16" taper. Converted to a slope angle, it becomes " $1^\circ 47'$ " per side. The difference in diameters between the secondary hole processing of the pilot hole using a 2° inclination angle end mill and the taper of the regular pipe pilot hole of $1^\circ 47'$ is less than 0.2 mm when the processing length is 25 mm.



Effective thread length of pipe taper screw (Rc)

Unit mm

SIZE	Effective thread length (minimum)	
	If there is an incomplete thread	If there is no incomplete thread
Rc 1/8-28	6.2	4.4
Rc 1/4-19	9.4	6.7
Rc 3/8-19	9.7	7.0
Rc 1/2-14	12.7	9.1
Rc 3/4-14	14.1	10.2
Rc 1 - 11	16.2	11.6
Rc 1 1/4-11	18.5	13.4
Rc 1 1/2-11	18.5	13.4
Rc 2 - 11	22.8	16.9