No.052

Plating thickness and oversized tap

Cutting tap

【Question】

I have a question about applying a plating after cutting an internal thread with metric tap. For example, when applying a 10 µm thick plating on a flat surface, the plating thickness needs to be 10 µm. When applying a plating on an internal thread, how much larger does the tap need to be over a standard tap size to create a 10 µm plating thickness?

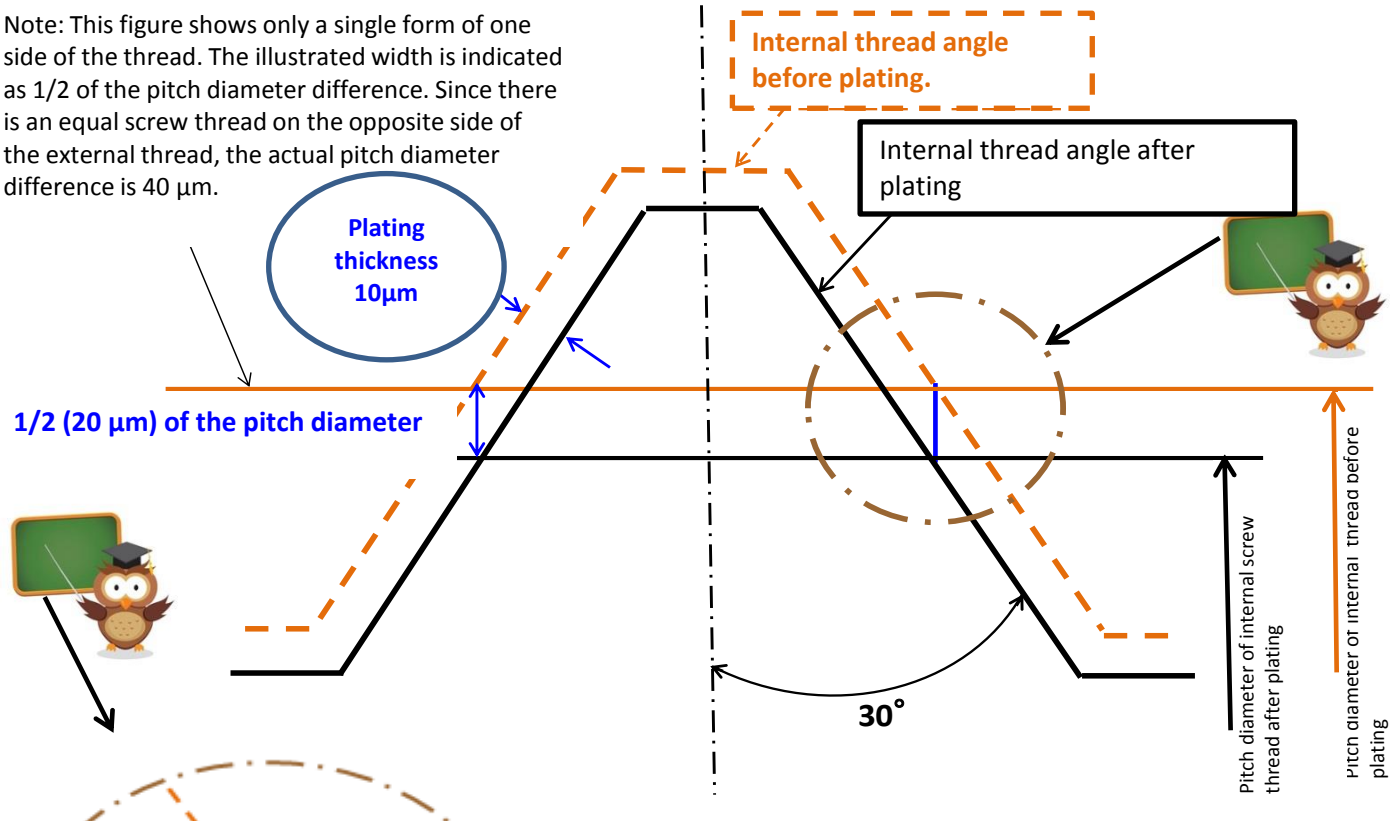
【Answer】

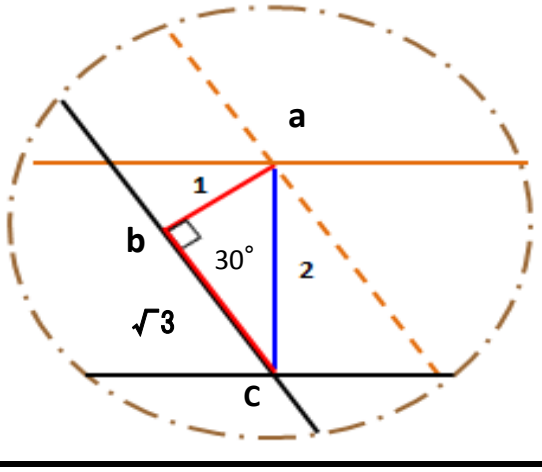
Basically, when a plating is applied to an internal thread, the pitch diameter of the internal thread will be reduced by four times the plating thickness. In this example, it would be 10 µm × 4 = 40 µm, so it is recommended to use an oversized tap with a standard tap limit accuracy of + 40 µm.

Sometimes this can be difficult to understand, so please refer to the relationship between a plating thickness and an internal thread pitch diameter shown below.

【Explanation】

Note: This figure shows only a single form of one side of the thread. The illustrated width is indicated as 1/2 of the pitch diameter difference. Since there is an equal screw thread on the opposite side of the external thread, the actual pitch diameter difference is 40 µm.





The half angle of a metric thread is 30 °. The triangle: a b c becomes a right triangle of 1, 2, and √ 3 as shown in Figure A. Therefore, when the plating thickness of: ab is 10 µm, the value measured in the pitch diameter direction is 10 µm × 2 or 20 µm. Also, since this value 20 µm is a value of one side of the external screw thread there is a total value of 40 µm thickness produced by the calculation 20 µm × 2 sides because there is a screw thread on the opposite side.