

IMPORTANT NOTES ON THREDFLOER PRE-TAP HOLE SIZES

DETERMINING DRILL SIZE

Thread forming taps require a larger pre-tap hole size than cutting taps because they do not produce a chip during tapping. The pre-tap hole size tolerance for smaller fine-pitch taps must be controlled more closely to prevent after-tap minor diameter problems.

Finding the correct drill size for a Thredfloer Tap may be a "Cut and Try" process. Not all drills are alike and therefore the pre-tap holes produced by different drills may be vastly different. What

matters is the actual pre-tap hole size, how consistently this hole size is maintained, and finally, the after-tap thread percentage or minor diameter. To get good results, you must know the actual hole size and not just the drill size! Thin wall parts may expand during tapping and produce oversize after-tap minor diameters. Diecast parts may contain porosity which may cause oversize holes due to shrinkage.

THREAD INSPECTION PROCEDURES

Pitch Diameter: The easy part is getting the "GO" and "NO-GO" thread gages, which check pitch diameter, to work correctly. As a rule of thumb, Thredfloer Taps should be two to three "H" or "D" numbers larger than cutting taps in order to gage correctly. Threads that are tight or loose after tapping can be rectified by increasing or decreasing tap pitch diameter ("H" or "D" number).

Minor Diameter: The most common problem is thread percentage. Unless otherwise specified, acceptance criteria are the minimum and maximum minor diameters for various thread sizes and classes of fit, as published by the ANSI Standards. These measurements are checked with cylindrical plug gages. It is important that these criteria be inspected during the initial "Testing" stage of drilling and tapping. Failure to check minor diameters may be very expensive.

It is often possible to fine tune the after-tap minor diameter by varying the tap pitch diameter. Changing a Thredfloer Tap by one "H" or "D" number is the same as changing the drill size by .0005 inches. For example, if the after tap minor diameter is too large, it may be reduced by using a larger tap pitch diameter, providing the no-go gage doesn't pass the part.

Example: A 1/4-20 Class 2B minor diameter should be .196/.207 inches. After tapping with an H5 tap, the part measured .205/.206", which is almost oversize. By switching to an H7 tap, you can reduce the after-tap minor diameter to .202/.203".

Suggested Procedure for Using a Thredfloer Tap

1. Test drill a part and measure the pre-tap hole size.
2. Test tap the part. Check pitch diameter with go and no-go gages. Check the thread percentage or minor diameter against the customer requirement.
3. Establish a maximum condition for the pre-tap hole size and monitor this frequently during the production tap run.

VISUAL THREAD INSPECTION

All formed threads have a cup or "U" in the crest due to the nature of the thread forming process. A properly sized hole should result in a thread percentage of 65-75%. Tapping with too small of a pre-tap hole size results in excessive tapping torque, tap wear, and possible tap breakage.

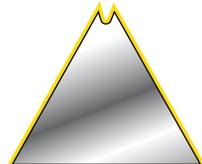
Always check your hole size after drilling. Do Not expect the drill will cut the size hole marked on the drill. Use a drill that will produce a 75% hole size where after-tap minor diameter gaging to 2B or 3B tolerances is required.

Correct Hole



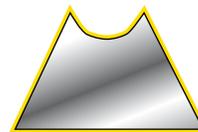
Pre-tap hole size is correct. Thread percentage is 65-75%, and the after-tap minor diameter is in specification.

Too Small



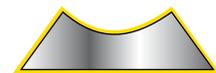
Resulting in a high thread percentage (90-100%) and an after-tap minor diameter which is too small.

Large



Suitable for some applications. Thread percentage is 55%. After-tap minor diameter is too large for 2B and 3B tolerances.

Too Large



Resulting in a low thread percentage (40%) and an after-tap minor diameter which is too big.