

Technical Tip #140 – Using the Correct Number of Passes When Threading

Using the correct number of passes will prevent premature insert failure.

When more passes than recommended are used, tool life will decrease.

If too few passes are used, the insert could chip and suffer failure.

The pitch of thread dictates the numbers of passes (see chart below). Using the correct number of passes will provide better tool life and good thread quality.

Recommendation for Threading Infeed Passes

TPI	48-32	28-24	20-16	14-12	11.5-9	8-6	5-4	3-2
metric pitch (mm)	0,50-0,75	0,80-1,0	1,25-1,5	1,75-2,0	2,5-3,0	3,5-4,0	4,5-6,0	8,0
Thread Type	recommended number of passes							
common V-thread forms ISO, UN, UNJ, NPT, Whitworth, BSPT, API Rotary Shoulder	4-5	5-6	6-8	8-10	9-12	12-15	14-16	15-25
Acme, Trapez, Round, API Round	-	-	5-6	7-8	10-11	12-13	13-15	18-20
Stub Acme, API Buttress	-	-	5	5-6	7-8	8-10	10-12	14-16
American Buttress	-	-	7-8	9-10	11-12	13-15	17-19	22-24

Maintain minimum .002 inch (0,05 mm) Infeed on last passes to avoid workhardening and excessive abrasion of the threading tool, for more detailed recommendations, see technical data on our website at www.kennametal.com

Constant Volume Infeed Values for Threading Operations

In most applications, use of CNC canned cycles produce only marginally successful results. This is the case as these programs do not satisfy the .002 inch (0,05 mm) minimum depth of cut specification recommended.

Example:

Infeed per pass formula: accumulated depth = initial doc x $\sqrt{\#}$ pass
For example, an 8-pitch external thread has a depth of .0789 inch. Twenty-five percent of .0789 = approximately .0197 inch (This is the infeed /doc for the first pass.)

$$.0197 \times \sqrt{2} = .0278$$

$$.0278 - .0197 = .0082 \text{ (This is the infeed/doc for the second pass.)}$$

$$.0197 \times \sqrt{3} = .0341$$

$$.0341 - .0278 = .0063 \text{ (This is the infeed/doc for the third pass.)}$$

$$.0197 \times \sqrt{4} = .0394$$

$$.0394 - .0341 = .0053 \text{ (This is the infeed/doc for the fourth pass.)}$$