

Pitch, lead and feed geometry

Two checks, two meanings: thread spacing is not the same as programmed feed speed.

01 RECORD THE THREAD IDENTITY WITHOUT GUESSING

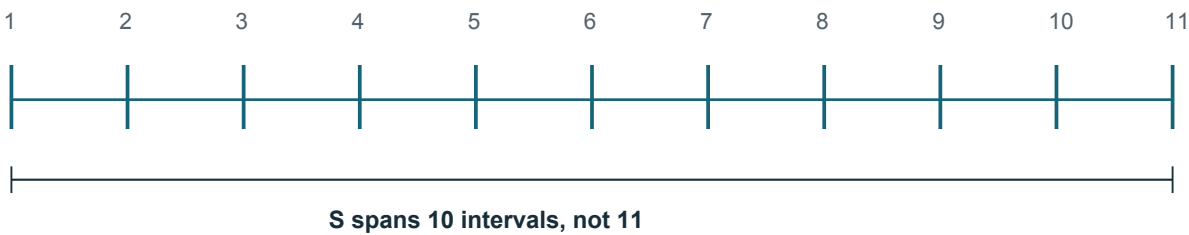
Drawing / designation / thread form

Hand + starts s + evidence source

Known pitch p (mm) or TPI

Measured span S (mm)

Number of intervals N



Axial crest-position schematic; not a thread profile or scale drawing.

Three relationships

Pitch p (mm) = $25.4 / \text{TPI}$ | $\text{TPI} = 25.4 / p$

Lead $l = s \times p$ | average measured pitch = S / N

Lead is axial advance per screw revolution [1]. Count gaps between equivalent crests, not the number of crests.

02 HYPOTHETICAL IDENTIFICATION CROSS-CHECK

Eleven equivalent crests span 15.00 mm: $N = 10$, so $p = 15.00/10 = \mathbf{1.500 \text{ mm}}$. $\text{TPI} = 25.4/1.5 = \mathbf{16.9333}$. This does not turn the thread into a standard 17 TPI thread. With two confirmed starts, lead is **3.000 mm/rev**.

Your $p = S/N$ or $25.4/\text{TPI}$

Your lead = $s \times p$

☐ Equivalent crests, clear axial measurement direction and interval count confirmed.

☐ Thread form, nominal diameter, handedness and fit still checked against the drawing.

Boundary

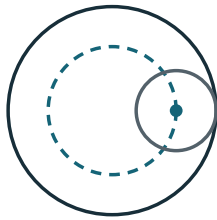
Pitch conversion does not identify a thread standard, tolerance class, tap-drill size or mating compatibility. Do not infer the start count from TPI alone.

Check the feed convention first

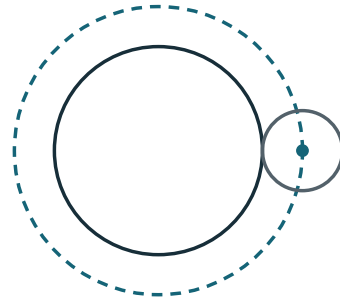
A planar circular-path correction is not a full helical toolpath or a ready-to-run F-word.

03 CHOOSE THE CORRECT INPUT CONVENTION

- ☐ Input Fedge is an uncorrected linear/peripheral feed in mm/min or in/min.
- ☐ If CAM already gives tool-center feed, stop: do not apply this correction again.



Internal: center path $D - d$



External: center path $D + d$

Solid circle: work diameter D . Dashed circle: center path. Small circle: cutter d .

Circular centerline relationships [2]

Internal: $F_{\text{center}} = F_{\text{edge}} \times (D - d)/D$ with $D > d > 0$

External: $F_{\text{center}} = F_{\text{edge}} \times (D + d)/D$ with $D > 0, d > 0$

Use matching length units. Obtain the applicable work and effective cutter diameters from the actual tool/CAM documentation, not a guessed thread label.

04 HYPOTHETICAL SAME-INPUT COMPARISON

Let $D = 30$ mm, $d = 8$ mm and $F_{\text{edge}} = 300$ mm/min. Internal ratio $22/30$ gives **220 mm/min**; external ratio $38/30$ gives **380 mm/min**. These are alternative planar geometries, not two feeds to add together.

Your D / d and effective-diameter source

Fedge / units / CAM field meaning

Ratio and resulting F_{center}

Post/control convention verified by

For a helix, axial travel per full orbit follows the thread lead: p for one start, $s \times p$ for multiple starts. This sheet does not calculate the 3D feed vector, lead-in/out, profile compensation, passes, runout or limits. Verify the supplier's strategy and the posted toolpath before machining.

[Online: Thread pitch calculator](#)

[Online: Thread milling calculator](#)

[1] Thomson - Difference between pitch and lead

[2] Harvey Performance - Circular Interpolation: Machining Circular Tool Paths