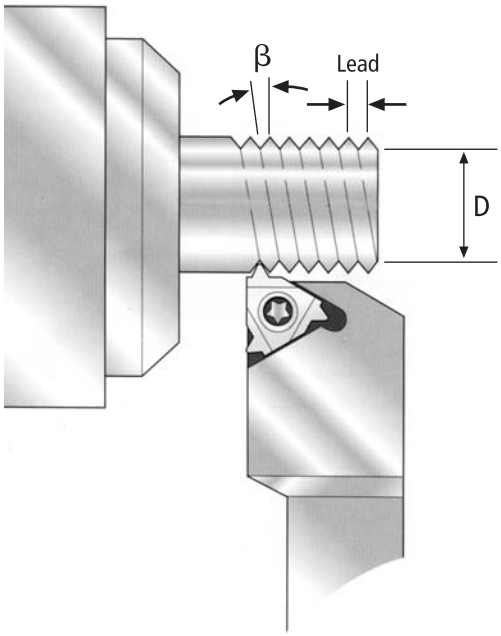
# Helix angle calculation




To calculate helix angle β for a given thread

$$\text{Tan } \beta = \frac{\text{Lead}}{\pi \text{ x D}}$$

(for single start threads, lead equals pitch)
(for multi-start threads, lead equals pitch x no of starts)

Although effective thread diameter is the preferred diameter to use in helix calculations, the actual thread diameter is generally used as it is easier to obtain and gives a close approximation

| Insert size | | Tool type | Positive Anvils | | | | | Negative Anvils | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Thread Helix Angle | | | | | Thread Helix Angle | |
| | | | 0º - 1º | STANDARD 1º-2º | 2º-3º | 3º-4º | 4º-5º | 0º-1º | 1º-2º |
| 16 | 3/8” | EX RH/ IN LH | AE16+0.5 | AE16 | AE16+2.5 | AE16+3.5 | AE16+4.5 | AE16.0.5 | AE16-1.5 |
| | | IN RH / EX LH | AI16+0.5 | AI16 | AI16+2.5 | AI16+3.5 | AI16+4.5 | AI16-0.5 | AI16-1.5 |
| 22 | 1/2” | EX RH / IN LH | AE22+0.5 | AE22 | AE22+2.5 | AE22+3.5 | AE22+4.5 | AE22-0.5 | AE22-1.5 |
| | | IN RH / EX LH | AI22+0.5 | AI22 | AI22+2.5 | AI22+3.5 | A122+4.5 | AI22-0.5 | AI22-1.5 |
| 22U | 1/2”U | EX RH / IN LH | AE22U+0.5 | AE22U | AE22U+2.5 | AE22U+3.5 | AE22U+4.5 | AE22U-0.5 | AE22U-1.5 |
| | | IN RH / EX LH | AI22U+0.5 | AI22U | AI22U+2.5 | AI22U+3.5 | A122U+4.5 | AI22U-0.5 | AI22U-1.5 |
| 27 | 5/8” | EX RH / IN LH | AE27+0.5 | AE27 | AE27+2.5 | AE27+3.5 | AE27+4.5 | AE27-0.5 | AE27-1.5 |
| | | IN RH / EX LH | AI27+0.5 | AI27 | AI27+2.5 | AI27+3.5 | AI27+4.5 | AI27-0.5 | AI27-1.5 |
| 27U | 5/8”U | EX RH / IN LH | AE27U+0.5 | AE27 | AE27U+2.5 | AE27U+3.5 | AE27U+4.5 | AE27U-0.5 | AE27U-1.5 |
| | | IN RH / EX LH | AI27U+0.5 | AI27 | AI27U+2.5 | AI27U+3.5 | AI27U+4.5 | AI27U-0.5 | AI27U-1.5 |

Premier toolholder pockets are manufactured with a 1.5º helix angle, and on toolholders that utilise an anvil, this helix angle can be changed to suit the thread by changing the anvil accordingly. The following table gives details of the positive anvils required to alter the helix angle of the thread. Negative anvils are only used to alter the helix angle of right hand tools when machining left hand threads, and left hand tools when machining right hand threads.