Technical Information

Toolholder Pockets

Premier toolholders are manufactured with a 1.5° helix angle built into the insert pocket, making it suitable for the majority of threading applications. Most toolholders are supplied with a neutral anvil, which if necessary can be changed to suit the helix angle of the thread being machined. External toolholders also have a 10° relief angle which gives natural clearance to the threading insert flank angles, whilst internal toolholders have a 15° relief angle to provide additional radial clearance.

Thread Forms

GTi indexable threading inserts are precision ground to ensure correct thread form when used in the correct toolholder, and are generally produced with a wear allowance. As external threading insert forms are different to their internal counterparts, using external inserts in internal toolholders, and vice versa, will result in thread form errors. Therefore, always use external inserts in external toolholders, and internal inserts in internal toolholders.

Flank Angle Clearance

When a GTi indexable threading insert is mounted in a toolholder, due to the relief angle in the pocket, the thread form will have natural clearance on the flank angles. These clearance angles can be calculated using the following formula:

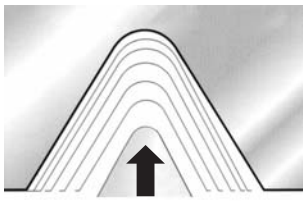
$$\mathbf{Tan\ \omega = (Tan\ \alpha\ x\ Tan\ \phi)}$$

where α = thread form angle from form centre line and ϕ = tool pocket relief angle. Popular thread form flank angle clearances are given in the table below.

Thread Form		ISO, UN, NPT, 60° partial profile	Whitworth, BSPT, 55° partial profile	Trapezoidal, Acme, Stub Acme	American buttress (45°/7°)	Sagengewinde (DIN 513) (30°/3°)
External toolholders	Leading edge clearance	5.8°	5.2°	2.6°	10°	5.8°
	Trailing edge clearance				1.2°	0.5°
Internal toolholders	Leading edge clearance	8.8°	7.9°	3.9°	15°	8.8°
	Trailing edge clearance				1.8°	0.8°

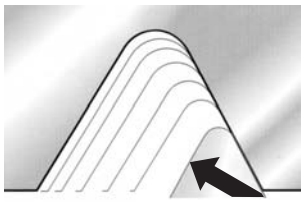
It may be prudent with assymetric thread forms such as buttresses, to utilise negative anvils to increase the trailing edge clearance angle.

Threading in-feed methods



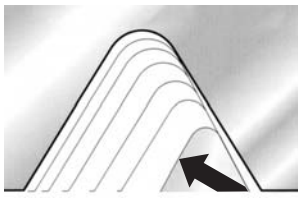
Radial In-feed

The most popular method of threading with material removed simultaneously from both sides of the insert form giving even insert wear. Can lead to vibration on larger thread forms.



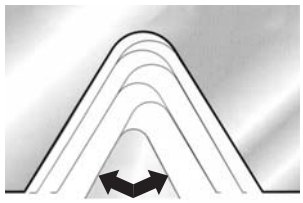
Flank In-feed

Generally used to produce less vibration, with easier swarf production and better heat dissipation. Can lead to dull finish on the non-cutting flank. Not recommended on work hardening materials.



Modified Flank In-feed

Generally used to produce less wear on the trailing cutting edge and a better surface finish. Not recommended on work hardening materials.



Alternating Flank In-feed

Generally used to produce even insert wear and longer insert life. Not recommended on work hardening materials