



Thread: Profile, types

Technically a thread is "a bevelled level equally wound around a cylinder".

This principle enables both a screw on/in as well as screw off function and thus forms the basic characteristic for "detachable" fastenings = screws and nuts.

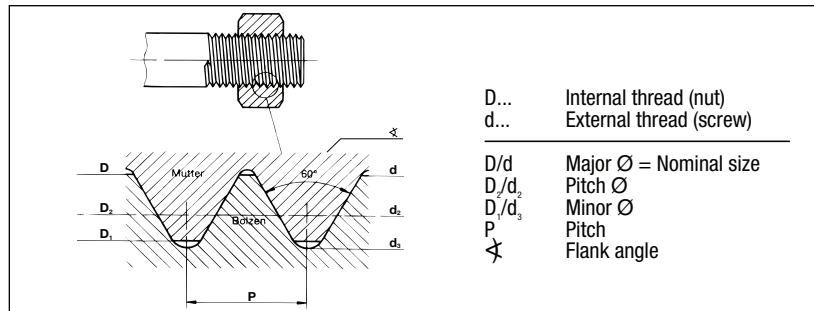
The geometric form and the standardised dimension and tolerance system make up the requirements for the coupling and exchangeability of the same kinds of thread profiles.

Thread profile, thread measuring points

The basic profile and the five measuring points of the thread are illustrated in picture A.

For external threads (screw) the dimension inspection is executed using ring gauges, flank micrometers and optical measuring devices, for internal threads (nuts), this is done using plug gauges.

Picture A:
Thread profile with 5 measuring points



Thread types

Table 1 shows an overview of the most common thread types for screws and nuts. The metric ISO thread has been valid since 1963 as a basis for global, uniform standardisation (ISO) for "Mechanical Fasteners".

Table 1: Overview of the most conventional thread types for mechanical fasteners (excerpt from DIN 202)

Code letter	Description	Version Usage	Designation Example	Flank angle	acc. to Standard
M	Metric ISO thread	Coarse thread right-hand	M 20 x 80	60°	ISO 724 (DIN 13-1)
M-LH		Coarse thread left-hand	M 20 x 80 LH		
M		Fine thread right-hand	M 20 x 2 x 80		
M-LH		Fine thread left-hand	M 20 x 2 x 80 LH		
M-SN 4	Metric ISO thread for transition fit	Interference fit thread sealing	M 20 Sn 4 x 80	55°	DIN 13-51
M-Sk 6		Interference fit thread non-sealing	M 20 Sk 6 x 80		
MFS			MFS 20 x 80		
M	Metric thread with large clearance	Screw threads with larger thread limit deviation nut tolerance 6H	DIN 2510 M 20 x 80		DIN 2510-2
EG-M	Metric ISO thread: helical coil threads for inserts	External thread dimensions for thread inserts with coarse and fine threading	EG M 20 / EG M 20 x 2		DIN 8140-2
M-taper	Metric external taper screw thread	for screw plugs and lubricating nipples	M 20 x 1.5 taper		DIN 158-1
G	Cylindrical Ww pipe threads where pressure-tight joints are not made on the threads	for pipes/pipe fastenings	G 3/4"	55°	ISO 228-1
R	Taper Ww piping thread where pressure-tight joints are not made on the threads	for external threads pipes / fittings/pipe screwed fastenings	R 3/4"		
Rp	Cylindrical Ww Pipe threads where pressure-tight joints are made on the thread	for internal thread pipes/ fittings/pipe screwed fastenings	Rp 3/4"		
Tr	Metric ISO trapezoidal thread (single-start and multi-start thread)	for general use	Tr 20 x 4	30°	ISO 2901-04
		Precision movement thread	acc. to specification		
Rd	Cylindrical round thread (single-start and multi-start thread)	for, e.g. flush pipe screwed fastenings	Rd 20 x 1/8		DIN 405-1.2
ST	Tapping screw thread		ST 4.2	60°	ISO 1478
-	Wooden screw thread		-		
UNC	USA: inch thread	Coarse thread	3/4-10 UNC	60°	ANSI B 1.1 B.S. 1580-1.2
UNF		Fine thread	3/4-16 UNF		
BSW	UK: inch thread	Coarse thread	3/4-10 BSW	55°	B.S. 84
BSF		Fine thread	3/4-12 BSF		

Thread manufacture

- Non-cutting production (= normal for large series production of screws)
 - thread rolling using profile barrels (M2-M30)
 - thread rolling using profile rolls ≥ M20
- Metal-cutting production
 - cutting using profile threading die
 - thread-chasing using profile clip
 - reeling using profile threading die
 - milling, grinding (for special movement threads)