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ISO metric trapezoidal screw threads
Gauging of external and internal threads
Gauge dimensions and design features

DIN 103 Part 9

Metrisches ISO-Trapezgewinde; Lehren für Bolzen- und Muttergewinde, Lehrenmaße und Baumerkmale

Supersedes August 1973 edition.

In keeping with current practice in standards published by the International Organization for Standardization (ISO), a comma has been used throughout as the decimal marker.

This standard gives specifications necessary for manufacturing gauges for ISO metric trapezoidal screw threads.

General specifications relating to the gauging system, nomenclature, gauging of workpieces and handling of gauges have not been separately standardized for gauges for trapezoidal screw threads; for these, DIN 13 Part 16 and Part 18 shall be applied as appropriate.

This standard specifies only the required gauge dimensions and design features. The manufacturing tolerances have been increased in comparison with those specified in DIN 13 Part 17 by about 45 % in order to compensate for the effect of the steeper flanks of the ISO metric trapezoidal thread.

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1 Thread profiles

1.1 Profiles with complete flanks

The following gauges shall have a profile as shown in figure 1:
Go check plug for new solid Go screw ring gauge;
Go check plug for new solid Not Go screw ring gauge;
Go screw plug gauge;
setting plug for Go screw calliper gauge;
Not Go check plug for new solid Not Go screw ring gauge;
setting plug for Not Go screw calliper gauge;
wear check plug for solid or adjustable Not Go screw ring gauge.

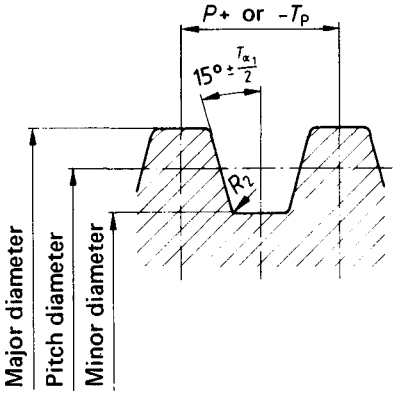
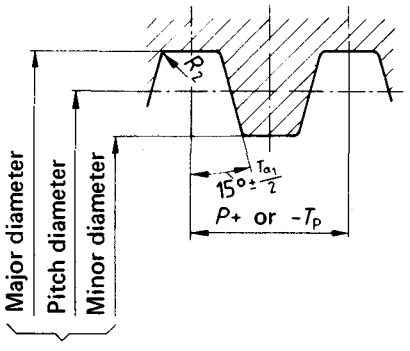


Figure 1. Profile with complete flanks

The following gauges shall have a profile as shown in figure 2:
solid Go screw ring gauge;
anvils of Go screw calliper gauge.



These diameters do not exist on anvils of Go screw calliper gauges.

Figure 2. Profile with complete flanks

Table 1. **Values of $R_{2\,max}$** (in mm)

Pitch P [1]	R_2 max.	Pitch P	R_2 max.
1,5	0,15	14	1
2	0,25	16	1
3	0,25	18	1
4	0,25	20	1
5	0,25	22	1
6	0,5	24	1
7	0,5	28	1
8	0,5	32	1
9	0,5	36	1
10	0,5	40	1
12	0,5	44	1

[1] P = pitch of single start trapezoidal thread.

The form of the root is at the manufacturer's discretion. The maximum size of the minor diameter and $R_{2\,max}$ shall not be exceeded.

1.2 Profiles with truncated flanks

The following gauges shall have a profile as shown in figure 3:

Not Go check plug for new solid Go screw ring gauge;

wear check plug for solid Go screw ring gauge;

Not Go screw plug gauge.

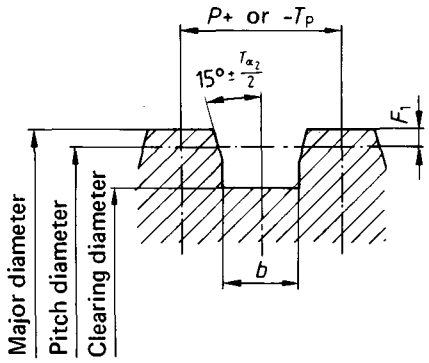
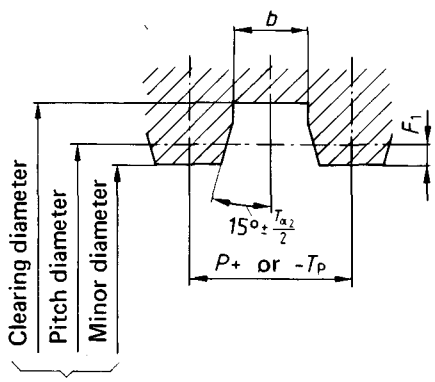


Figure 3. Profile with truncated flanks

The following gauges shall have a profile as shown in figure 4:

solid Not Go screw ring gauge;

anvils of Not Go screw calliper gauge.



These diameters do not exist on anvils of Not Go screw calliper gauges.

Figure 4. Profile with truncated flanks

Gauges with truncated flanks have a clearance groove b, the form of which is left to the discretion of the manufacturer. For the symmetry tolerance s of the clearance groove, see table 2.

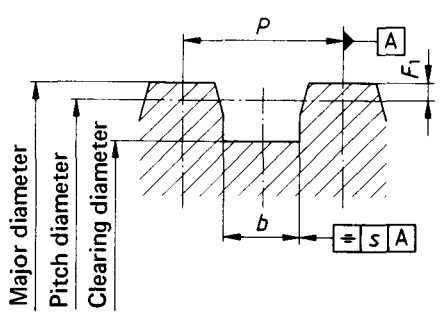


Figure 5. Symmetry tolerance s of the clearance groove b

Table 2. **Values of b and F_1 for profiles with truncated flanks** (in mm, see figures 3 and 4)

Pitch P [1]	$F_1 = 0{,}1\,P$	b		s
		Nominal size	Limit deviations	
1,5	0,15	0,6	± 0,04	0,04
2	0,2	0,85	± 0,05	0,05
3	0,3	1,25	± 0,08	0,08
4	0,4	1,7	± 0,1	
5	0,5	2,2	± 0,1	0,1
6	0,6	2,65	± 0,1	
7	0,7	3,1	± 0,1	
8	0,8	3,6	± 0,1	0,1
9	0,9	4,05	± 0,1	
10	1	4,5	± 0,1	0,1
12	1,2	5,4	± 0,1	0,1
14	1,4	6,35	± 0,15	0,15
16	1,6	7,25	± 0,15	
18	1,8	8,2	± 0,15	0,15
20	2	9,15	± 0,15	
22	2,2	10,1	± 0,15	
24	2,4	11,05	± 0,15	0,15
28	2,8	12,9	± 0,15	
32	3,2	14,9	± 0,2	
36	3,6	16,85	± 0,2	0,2
40	4	18,7	± 0,2	
44	4,4	20,6	± 0,2	0,2

1) P = pitch of single start trapezoidal thread.

The limit deviations for b may be exceeded if the real displacement is less than the symmetry tolerance s, by twice the amount of the difference between the symmetry tolerance s and the real displacement.

2 Tolerance zones

2.1 Tolerance zones for pitch diameter (see figures 6 and 7)

Symbol	Quantity
T_{D2}, T_{d2}	Tolerance on the pitch diameter of the workpiece thread
T_R	Tolerance on the pitch diameter of the Go screw ring gauge and the Not Go screw ring gauge
T_{CP}	Tolerance on the pitch diameter of (Go and Not Go) check plugs, wear check plugs and setting plugs
T_{PL}	Tolerance on the pitch diameter of Go and Not Go screw plug gauges
W_{GO}	Average amount available for permissible wear on the Go screw plug gauge and Go screw ring gauge
W_{NG}	Average amount available for permissible wear on the Not Go screw plug gauge and the Not Go screw ring gauge
Z_R	Distance of the centre of the tolerance zone of tolerance T_R of the Go screw ring gauge from the upper limit of the workpiece
m	Distance between the centres of the tolerance zones of tolerance T_R of the screw ring gauge and T_{CP} of the Go check plug
Z_{PL}	Distance of the centre of the tolerance zone of tolerance T_{PL} of the Go screw plug gauge from the lower limit of the workpiece thread

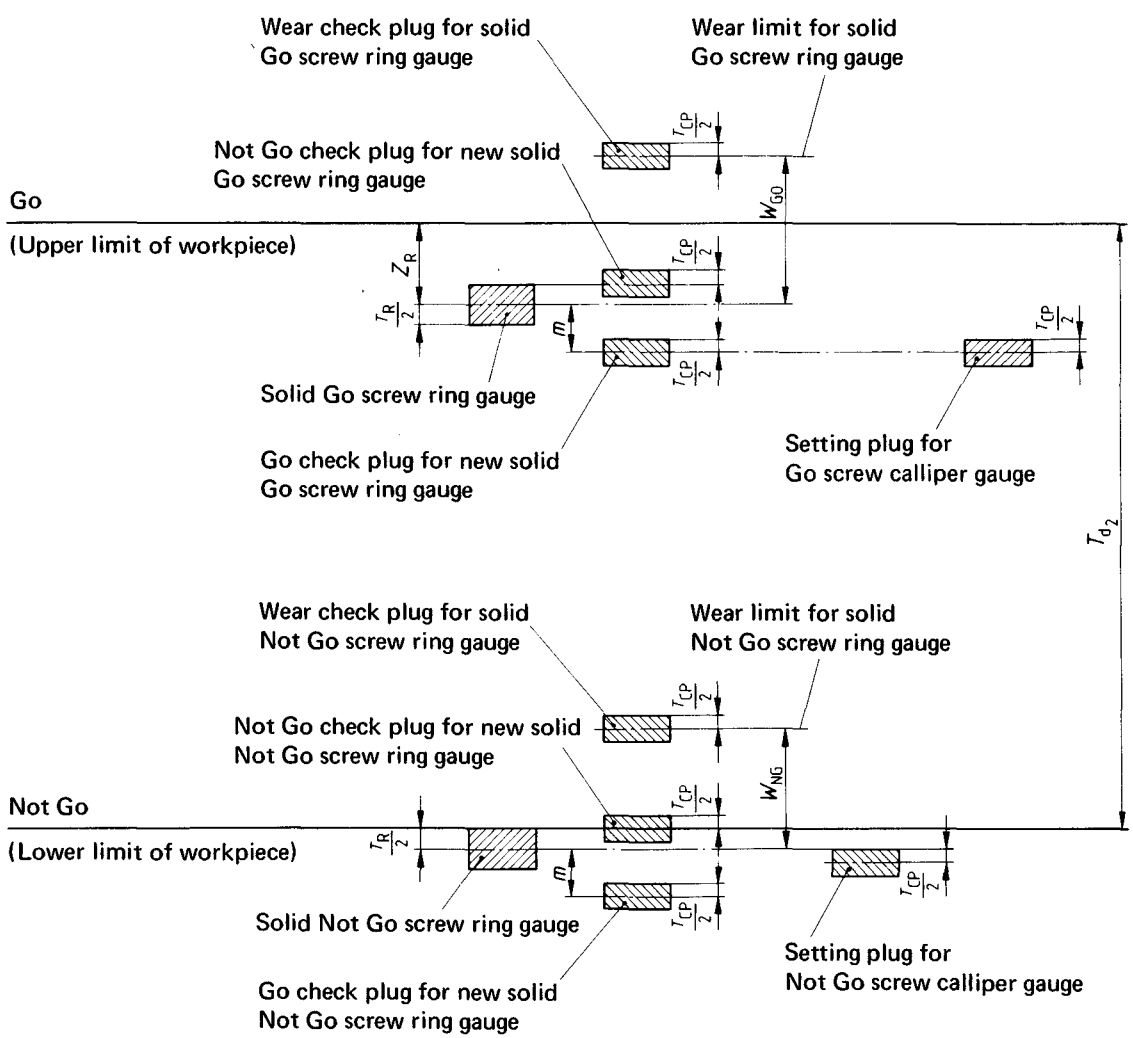


Figure 6. Tolerance zones for the pitch diameter of gauges for checking external threads