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Technical product documentation (TPD) — Relief grooves — Types and dimensioning

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ISO 18388

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Technical product documentation (TPD) — Relief grooves — Types and dimensioning

Documentation technique de produits (DPT) — Rainures en relief — Types et dimensionnement

Reference number
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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 10, *Technical product documentation*, Subcommittee SC 6, *Mechanical engineering documentation*.

INTERNATIONAL STANDARD ISO 18388:2016(E)

Technical product documentation (TPD) — Relief grooves — Types and dimensioning

1 Scope

This International Standard specifies a series of relief grooves for shafts and holes, intended for general use in mechanical engineering.

It also intends to avoid unnecessary multiplicity of tools by a restricted selection of groove-types and dimensional versions.

NOTE The shape and the dimensions of the relief grooves type G and H correspond with the "Indexable hard material inserts" according to ISO 6987.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 128-22, *Technical drawings — General principles of presentation — Part 22: Basic conventions and applications for leader lines and reference lines*

ISO 128-24, *Technical drawings — General principles of presentation — Part 24: Lines on mechanical engineering drawings*

3 Terms and definitions

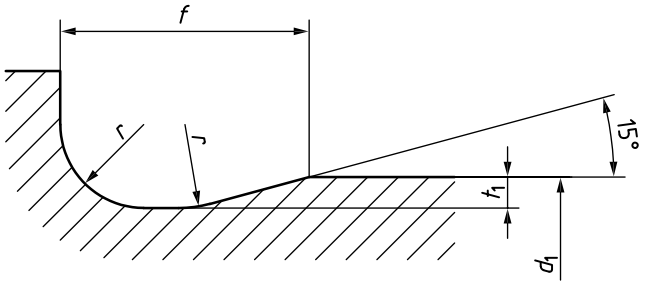
For the purposes of this document, the following terms and definitions apply.

3.1
relief groove
clearance groove of specified form and dimensions created by removing material at an inner corner of a rotationally symmetric workpiece and which is necessary for subsequent machining and assembly with mating parts

4 Dimensions

4.1 Relief groove type E

The relief groove type E, see Figure 1, shall be applied to workpieces where the planar surface is not subjected to high fatigue loads and where the cylindrical surface will be subsequently machined if necessary. They are also suitable where mating parts have a relatively large counterbore or will not be in contact with the planar surface.



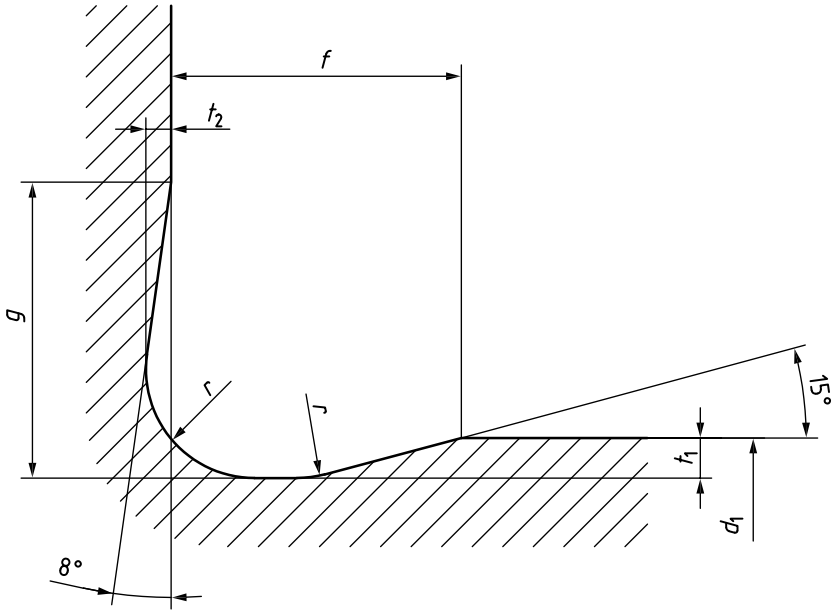
Key

d_1 workpiece diameter
f width of relief grooves
r radius of relief grooves
t_1 depth of recess

Figure 1 — Relief groove for cylindrical surfaces intended for subsequent machining

4.2 Relief groove type F

The relief groove type F, see Figure 2, shall be applied to workpieces with surfaces that are perpendicular to each other and are intended for subsequent machining.



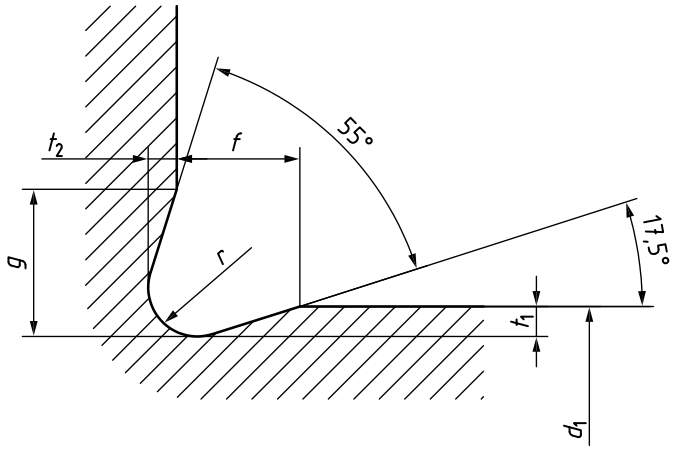
Key

d_1 workpiece diameter
f, g width of relief grooves
r radius of relief grooves
t_1, t_2 depth of recess

Figure 2 — Relief groove for cylindrical and planar surfaces intended for subsequent machining

4.3 Relief groove type G

The relief groove type G, see Figure 3, shall be applied to workpieces which are not subjected to high fatigue loads and where a small included angle is required.



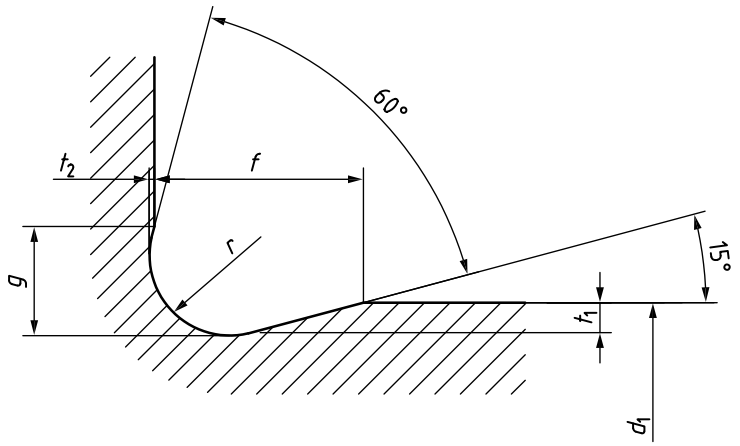
Key

d_1 workpiece diameter
f, g width of relief grooves
r radius of relief grooves
t_1, t_2 depth of recess

Figure 3 — Relief groove with smaller included angle

4.4 Relief groove type H

The relief groove type H, see Figure 4, shall be applied to workpieces with surfaces that are perpendicular to each other and are intended for subsequent machining (but with a greater included angle).



Key

d_1 workpiece diameter
f, g width of relief grooves
r radius of relief grooves
t_1, t_2 depth of recess

Figure 4 — Relief groove with greater included angle

5 Dimensions of the relief grooves

5.1 Relief grooves

The dimensional values of the relief grooves shall be used for holes and shafts, see Table 1.

Table 1 — Dimensions of the relief grooves

Dimensions in millimetres

Type	r[a]		t_1	t_2	f	g	Corresponding diameter d_1[b] for workpieces	
	Series 1	Series 2					subjected to normal loads[c]	subjected to higher alternating loads
E		R0,2	0,1	—	1	—	Over Ø 1,6 up to Ø 3	—
	R0,4		0,2	—	2	—	Over Ø 3 up to Ø 18	—
		R0,6	0,2	—	2	—	Over Ø 10 up to Ø 18	—
		R0,6	0,3	—	2,5	—	Over Ø 18 up to Ø 80	—
	R0,8		0,3	—	2,5	—	Over Ø 18 up to Ø 80	—
		R1	0,2	—	2,5	—	—	Over Ø 18 up to Ø 50
		R1	0,4	—	4	—	Over Ø 80	—
	R1,2		0,2	—	2,5	—	—	Over Ø 18 up to Ø 50
	R1,2		0,4	—	4	—	Over Ø 80	—
	R1,6		0,3	—	4	—	—	Over Ø 50 up to Ø 80
	R2,5		0,4	—	5	—	—	Over Ø 80 up to Ø 125
	R4		0,5	—	7	—	—	Over Ø 125
F		R0,2	0,1	0,1	1	(0,9)	Over Ø 1,6 up to Ø 3	—
	R0,4		0,2	0,1	2	(1,1)	Over Ø 3 up to Ø 18	—
		R0,6	0,2	0,1	2	(1,4)	Over Ø 10 up to Ø 18	—
		R0,6	0,3	0,2	2,5	(2,1)	Over Ø 18 up to Ø 80	—
	R0,8		0,3	0,2	2,5	(2,3)	Over Ø 18 up to Ø 80	—
		R1	0,2	0,1	2,5	(1,8)		Over Ø 18 up to Ø 50
		R1	0,4	0,3	4	(3,2)	Over Ø 80	—
	R1,2		0,2	0,1	2,5	(2)	—	Over Ø 18 up to Ø 50
	R1,2		0,4	0,3	4	(3,4)	Over Ø 80	—
	R1,6		0,3	0,2	4	(3,1)	—	Over Ø 50 up to Ø 80
	R2,5		0,4	0,3	5	(4,8)	—	Over Ø 80 up to Ø 125
	R4		0,5	0,3	7	(6,4)	—	Over Ø 125
G	R0,4		0,2	0,2	(0,9)	(1,1)	Over Ø 3 up to Ø 18	—
H	R0,8		0,3	0,05	(2,0)	(1,1)	Over Ø 18 up to Ø 80	—
	R1,2		0,3	0,05	(2,4)	(1,5)	—	Over Ø 18 up to Ø 50

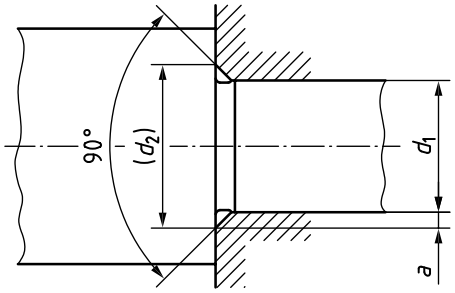
[a] Relief grooves radii of the series 1 have to be preferred.

[b] Does not apply to parts with a short shoulder and thin-walled parts. When a workpiece has different diameters, it may be expedient for manufacturing reasons to use several relief grooves having the same form and size.

[c] Type G applies only to workpieces which are not subjected to high fatigue loads.

5.2 Countersink at the counterpart

The countersink at the counterpart by dimensions *a*, see Figure 5 and Table 2.



Key

a dimension of the countersunk

d_1 nominal size of the workpiece

d_2 $=d_1 + 2a$

Figure 5 — Countersink at the counterpart

Table 2 — Dimension *a*

Dimensions in millimetres

Relief grooves size	Minimum dimension *a* for			
$r \times t_1$	Type E	Type F	Type G	Type H
0,2 × 0,1	0,2	0	—	—
0,4 × 0,2	0,3	0	0	—
0,6 × 0,2	0,5	0,15	—	—
0,6 × 0,3	0,4	0	—	—
0,8 × 0,3	0,6	0,05	—	0,35
1,0 × 0,2	0,9	0,45	—	—
1,0 × 0,4	0,7	0	—	—
1,2 × 0,2	1,1	0,6	—	—
1,2 × 0,3	—	—	—	0,65
1,2 × 0,4	0,9	0,1	—	—
1,6 × 0,3	1,4	0,6	—	—
2,5 × 0,4	2,2	1,0	—	—
4,0 × 0,5	3,6	2,1	—	—

6 Designation

The designation of relief grooves shall include the following elements:

— the term “Relief groove”;

— the number of this International Standard, i.e., ISO 18388;

— a hyphen;

— designation of the form by the relevant letter;

— the relief grooves size (radius *r* and depth t_1 separated by “×”).

EXAMPLE Designation of a type E relief groove, radius r = 0,8 mm, depth t_1 = 0,3 mm:

Relief groove ISO 18388 – E 0,8×0,3

7 Presentation on the drawing

7.1 General

Relief grooves can be shown in two presentation methods on technical drawings. The first method is to show the relief groove in a conventional representation and show how to present full details (see Figure 6 and Figure 7). The second method is the simplified representation of relief grooves shown in technical drawings. This method shall preferably be drawn by using a continuous wide line, type 01.2 as in ISO 128-24. Designations shall be given in conjunction with a leader line and reference line as in ISO 128-22 (see Figures 8 and Figure 9).

7.2 Conventional representation

Dimensions in millimetres

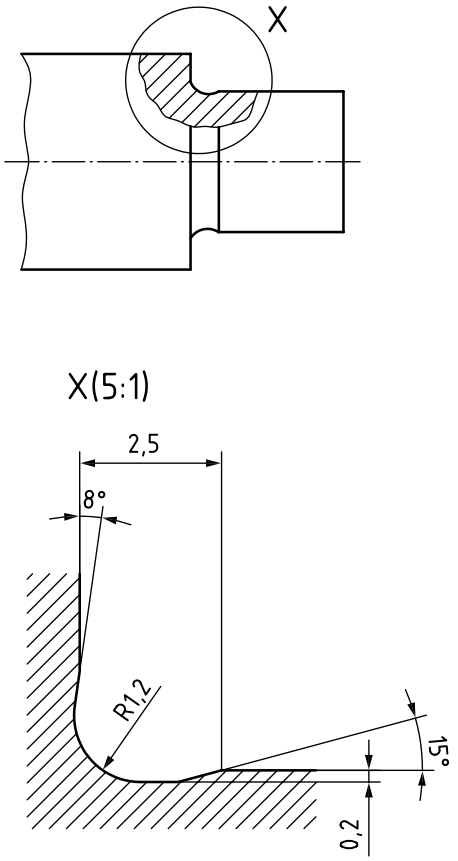


Figure 6 — Detailed representation of relief grooves F 1,2×0,2

Dimensions in millimetres

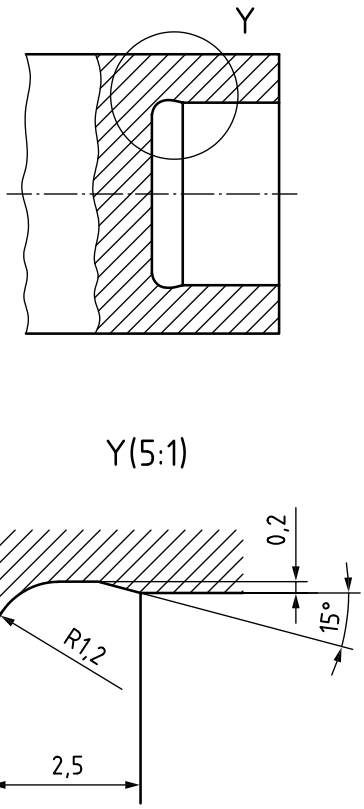


Figure 7 — Detailed representation of relief grooves E 1,2×0,2

7.3 Simplified representation

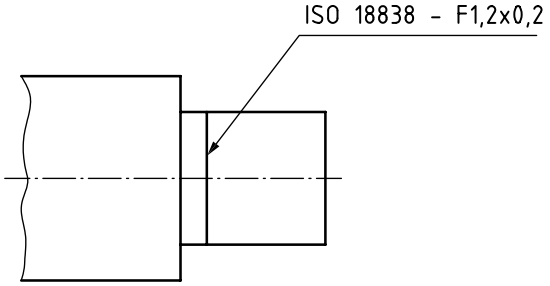


Figure 8 — Simplified representation of relief grooves Relief groove ISO 18388 – F 1,2×0,2

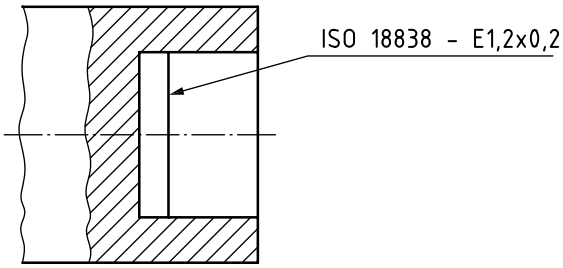


Figure 9 — Simplified representation of relief grooves Relief groove ISO 18388 – E 1,2×0,2

Bibliography

[1] ISO 6987, *Indexable hard material inserts with rounded corners, with partly cylindrical fixing hole — Dimensions*

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