

DIN 509**DIN**

ICS 01.100.20; 25.020

Supersedes
DIN 509:1998-06**Technical drawings –
Undercuts –
Types and dimensions**Technische Zeichnungen –
Freistiche –
Formen, Maße

Document comprises 11 pages

Translation by DIN-Sprachendienst.

In case of doubt, the German-language original should be consulted as the authoritative text.



Foreword

This standard has been prepared by the *Normenausschuss Technische Grundlagen* (NATG) (Fundamental Technical Standards Committee), Section 6 “Technical Product Documentation”, Technical Committee NA 152-06-05-AA “Technical Drawing”, with the cooperation of experts from the *Normenausschuss Maschinenbau* (NAM) and *Normenausschuss Werkzeuge und Spannzeuge* (FWS) (Mechanical Engineering, and Tools and Clamping Devices Standards Committees, respectively).

Amendments

This standard differs from DIN 509:1998-06 as follows:

- a) The title now includes the introductory element “Technical drawings”.
- b) The machining allowance symbol “z” has been replaced by the symbols “z₁” and “z₂”.
- c) In Figure 4 the machining allowances indicated are now the same size.
- d) In Figure 5 the dimensions “g” and “f” have been deleted.
- e) In Figure 6 the symbol for counterbore “a/2” has been changed to “a”.
- f) Figures 7, 8, 9 and 10 are in a different order.
- g) In clause 9, example 2 has been corrected to read “Undercut E 1,2 × 0,2”.
- h) In Figures 9 and 10 (formerly 7 and 8), Details “X” and “Y”, the tolerance “± 0,1” has been added to “R1,2”.
- i) In Figures 9 and 10 (formerly 7 and 8) the roughness data have been deleted.
- j) Table 1 has been rearranged.
- k) In Table 1 the values for radii are now preceded by an “R”.
- l) In Table 1 the value for dimension “f” for type G undercuts has been corrected to “0,9”.
- m) In Table 1 the value for dimension “f” for Undercut H 1,2 × 0,3 has been corrected to “2,4”.
- n) In Table 1 the value for dimension “t₂” for Undercut F 4 × 0,5 is now included.
- o) In Table 1 the value for dimension “g” for Undercut G 0,4 × 0,2 has been corrected to “1,1”.
- p) In Table 2 dimensions “e₁” and “e₂” are now included in one column for type H undercuts, as they are equally long.
- q) Table 2 has been rearranged.
- r) In Table 3 the values for dimension “a” have been divided in half and re-calculated.
- s) In clause 5 surface roughness specifications have been brought in line with DIN EN ISO 1302.
- t) In clause 6 the second example now includes the designation “MRR” (“material removal required”) in accordance with DIN EN ISO 1302.

- u) Clause 9 now makes reference to the preferred type of line for drawings, as well as to the fact that the designation is to be given in conjunction with a leader line and a reference line.
- v) References have been updated.
- w) The standard has been editorially revised.

Previous editions

DIN 509: 1956-04, 1966-01, 1966,08, 1998-06

Foreword

Forms and dimensions of type G and H undercuts conform to those for indexable inserts as in DIN ISO 6987 and DIN 4969-1 (type G rhombic inserts) and as in DIN ISO 6987, DIN 4968 and DIN 4969-1 (type H triangular inserts). It is economically expedient to use the above inserts to produce the undercuts specified in this standard.

Although Figures 1 to 6 show undercuts for shafts and axles, the numerical values specified here also apply to bores by analogy.

All radii specified in this standard are in accordance with DIN 250.

1 Scope

This standard applies to undercuts on turned parts and in bores, and helps reduce the variety of tools needed to produce such undercuts.

2 Normative references

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

DIN EN ISO 1302, *Geometrical Product Specifications (GPS) — Indication of surface texture in technical product documentation*

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

DIN 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 standard the following term applies.

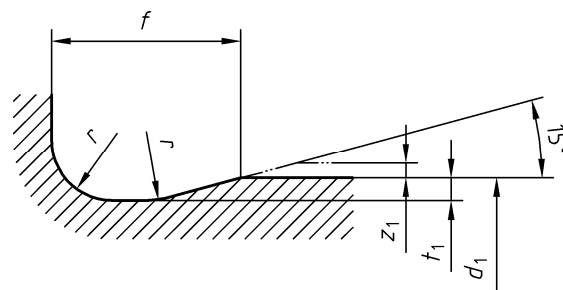
undercut

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 Type E undercuts

Type E undercuts are suitable 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 undercut
- r radius of undercut
- t_1 depth of recess
- z_1 machining allowance

Figure 1 — Undercut for workpieces with cylindrical surface intended for subsequent machining