
**Technical drawings — General principles of
presentation —**

Part 50:

**Basic conventions for representing areas
on cuts and sections**

Dessins techniques — Principes généraux de représentation

*Partie 50: Conventions de base pour la représentation des surfaces sur
des coupes et des sections*



Reference number
ISO 128-50:2001(E)

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this part of ISO 128 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 128-50 was prepared by Technical Committee ISO/TC 10, *Technical product documentation*, Subcommittee SC 1, *Basic conventions*.

This first edition of ISO 128-50 is based on ISO 128:1982, subclauses 4.1 to 4.3 of which it cancels and replaces.

ISO 128 consists of the following parts, under the general title *Technical drawings — General principles of presentation*:

- *Part 20: Basic convention for lines*
- *Part 21: Preparation of lines by CAD systems*
- *Part 22: Basic conventions and applications for leader lines and reference lines*
- *Part 23: Lines on construction drawings*
- *Part 24: Lines on mechanical engineering drawings*
- *Part 25: Lines on shipbuilding drawings*
- *Part 30: Basic conventions for views*
- *Part 34: Views on mechanical engineering drawings*
- *Part 40: Basic conventions for cuts and sections*
- *Part 44: Sections on mechanical engineering drawings*
- *Part 50: Basic conventions for representing areas on cuts and sections*

The following part is under preparation:

- *Part 1: Introduction and index*

Technical drawings — General principles of presentation —

Part 50:

Basic conventions for representing areas on cuts and sections

1 Scope

This part of ISO 128 specifies general principles for representing areas on cuts and sections on technical drawings (mechanical, electrical, architectural, civil-engineering etc.) following the orthographic projection methods specified in ISO 5456-2.

Attention has also been given to the requirements of reproduction, including microcopying in accordance with ISO 6428.

NOTE The basic rules for cuts and sections are given in ISO 128-40^[1].

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 128. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 128 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 128-20, *Technical drawings — General principles of presentation — Part 20: Basic conventions for lines.*

ISO 128-24:1999, *Technical drawings — General principles of presentation — Part 24: Lines on mechanical engineering drawings.*

ISO 5456-2, *Technical drawings — Projection methods — Part 2: Orthographic representations.*

ISO 6428, *Technical drawings — Requirements for microcopying.*

ISO 10209-1, *Technical product documentation — Vocabulary — Part 1: Terms relating to technical drawings: general and types of drawings.*

ISO 10209-2, *Technical product documentation — Vocabulary — Part 2: Terms relating to projection methods.*

3 Terms and definitions

For the purposes of this part of ISO 128, the terms and definitions given in ISO 10209-1 and ISO 10209-2 apply.

4 General

This part of ISO 128 specifies six methods for the representation of areas on cuts and sections. These consist of indication

- by hatching (see clause 5),
- by shading or toning (see clause 6),
- by extra-wide continuous outlines (see clause 7),
- of thin sections (see clause 8),
- of thin adjacent sections (see clause 9), and
- of special materials (see clause 10).

Allowance shall be made for the means of reproduction used, in accordance with ISO 6428.

5 Hatching

Hatching shall be done with the narrow continuous lines of type 01.1.5 specified in ISO 128-24:1999 and at a convenient angle (preferably 45°) to the principal outlines or lines of symmetry of cuts or sections (see Figure 1).

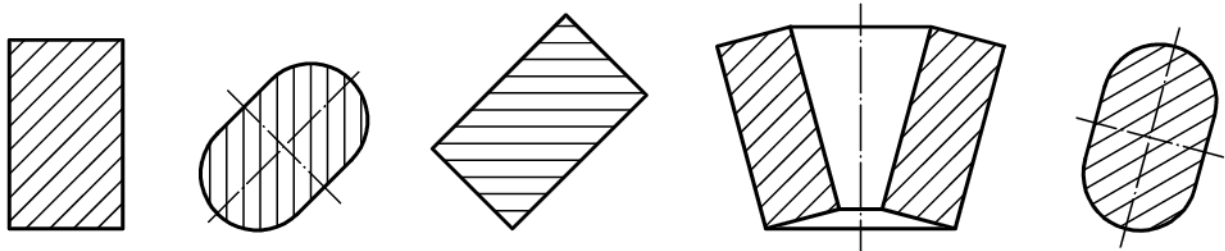


Figure 1 — Hatching of areas of cuts or sections — Examples

Separate areas of a cut or section of the same component shall be hatched in an identical manner. The hatching of adjacent components shall be carried out using the specified lines running in different directions or differently spaced (see Figure 2).

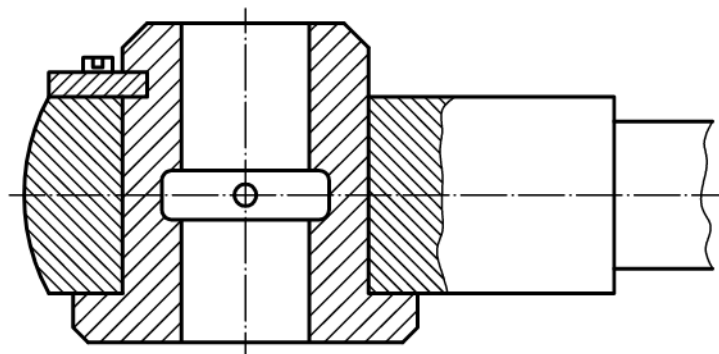


Figure 2 — Hatching of adjacent areas

Spacing between the hatching lines should be chosen in proportion to the size of the hatched areas, provided this is in accordance with the requirements for minimum spacing given in ISO 128-20.

Where cuts or sections of the same part in parallel are shown side by side, the hatching shall be identical (see Figure 3), but may be offset along the dividing line between the cuts or sections for greater clarity.

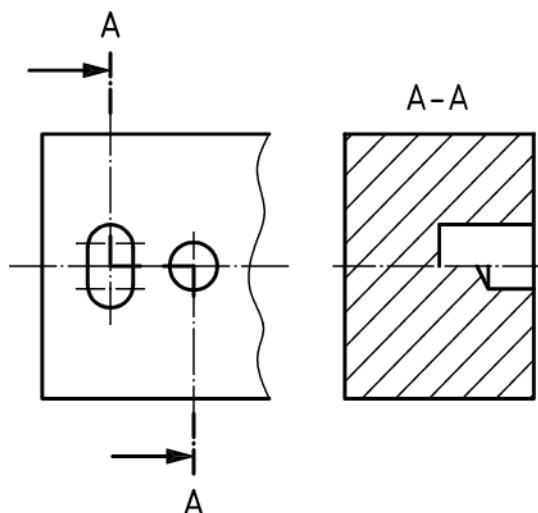


Figure 3 — Hatching of an area parallel cuts or sections

In the case of a large area, the hatching may be limited to a zone that follows the contour of the area (see Figure 4).



Figure 4 — Hatched contour of large area

Hatching shall be interrupted for inscriptions inside an area (see Figure 5).

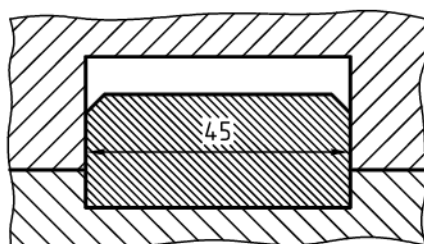


Figure 5 — Hatching interrupted by inscription

6 Shading or toning

Shading may consist of a pattern of dots or an overall toning of area (see Figure 6).

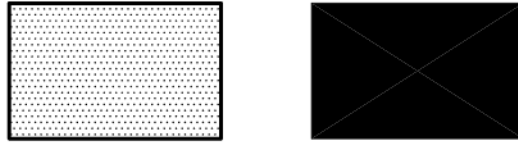


Figure 6 — Shading using dots and toning

Spacing between dots should be chosen in proportion to the size of a shaded area. In the case of a large area, the shading may be limited to a zone that follows the area's contour (Figure 4).

Shading or toning shall be interrupted for inscriptions inside an area (Figure 5).

7 Extra-wide continuous outlines

Areas of cuts and sections may be emphasized by the extra-wide continuous line specified in ISO 128-20 (see Figure 7).

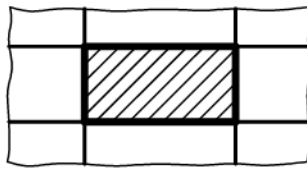


Figure 7 — Extra-wide continuous outline for emphasis

8 Thin sections

Thin sections may be shown entirely black (see Figure 8).

This method shall represent true geometry.



Figure 8 — Thin sections

9 Thin adjacent sections

Solid sections may be shown entirely black. A space of not less than 0,7 mm shall be left between adjacent sections of this type. See Figure 9.

This method does not represent true geometry.



Figure 9 — Thin adjacent sections

10 Specific materials

Different types of special representation can be used to indicate specific materials. If a special representation is used, its signification shall be clearly defined on the drawing (e.g. by a legend, or by reference to appropriate standards).

Bibliography

- [1] ISO 128-40, *Technical drawings — General principles of presentation — Part 40: Basic conventions for cuts and sections*.

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