

INTERNATIONAL STANDARD

**ISO
8167**

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Projections for resistance welding

Bossages pour le soudage par résistance



Reference number
ISO 8167 : 1989 (E)

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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 8167 was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*.

Annexes A and B of this International Standard are for information only.

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Projections for resistance welding

1 Scope

This International Standard specifies the characteristics and dimensions of projections for resistance welding; it also includes the appropriate design and dimensions for tools (see annex B).

The projections may be used on either hot-rolled or cold-rolled, uncoated mild steel, of conventional welding quality and up to 3 mm thick, as single projections, in multiples or as a group of multiples.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 286-1 : 1988, *ISO System of limits and fits — Part 1: Bases of tolerances, deviations and fits.*

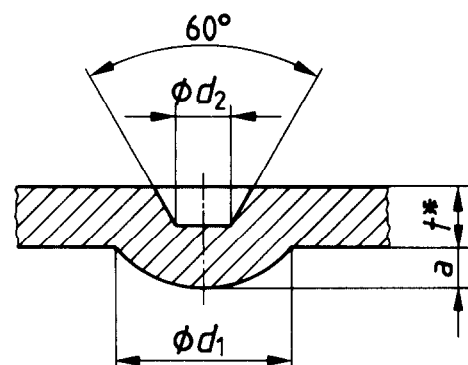
3 Dimensions

The dimensions shall be as specified in figure 1 and table 1.

The tolerance on the projection diameter, d_1 , shall be $^{+0,1}_0$ mm; the tolerance on the projection height, a , shall be $\pm 10\%$, except in the case where a number of projections are to be welded in one operation, when the height of the individual projections on any of the components comprising the assembly shall not vary by more than 5 % from one another.

NOTES

- The height, a , is determined by the punch stroke.
- If sheet thicknesses are different, the projection should be manufactured in the thicker sheet with the dimensions of the thinner sheet.



* See annex A for relationship between sheet thickness, t , and projection diameter, d_1 .

Figure 1 — Projection for resistance welding

Table 1 — Dimensions

Dimensions in millimetres

$d_1^{1)}$ +0,1 0	$a^{2)}$	d_2
1,6	0,4	0,5
2	0,5	0,63
2,5	0,63	0,8
3,2	0,8	1
4	1	1,25
5	1,25	1,6
6,3	1,6	2
8	2	2,5
10	2,5	3,2

1) The diameter of the forming tool, d_3 , shall be greater than or equal to d_1 ; an example of a forming tool is given in annex B.
2) See clause 3 for tolerance on the height, a .

4 Designation

Projections (P) covered by this International Standard shall be designated using the following information in the order given:

- the description (i.e. "Projection");
- the reference of this International Standard;
- the projection diameter, d_1 , in millimetres.

Example:

A projection with a diameter, d_1 , of 2,5 mm shall be designated as follows:

Projection ISO 8167-P2,5

Annex A (informative)

Relationship between sheet thickness and projection diameter

For the various applications and the required strength determined by weld strength and material properties, it is recommended that, according to the sheet thickness, the following three different groups of projection diameters (see table A.1) be adopted:

- **Group A** Comprises small size projections for applications where space is limited or minimum marking is required;
- **Group B** Projections for standard applications which usually need more space and leave larger marks than Group A projections;
- **Group C** Large size projections for high strength applications, where space or shape limits the application or use of multi-projections; normally used with high strength steels.

For easy designation it may be convenient to reach agreement on the groups in national or company standards.

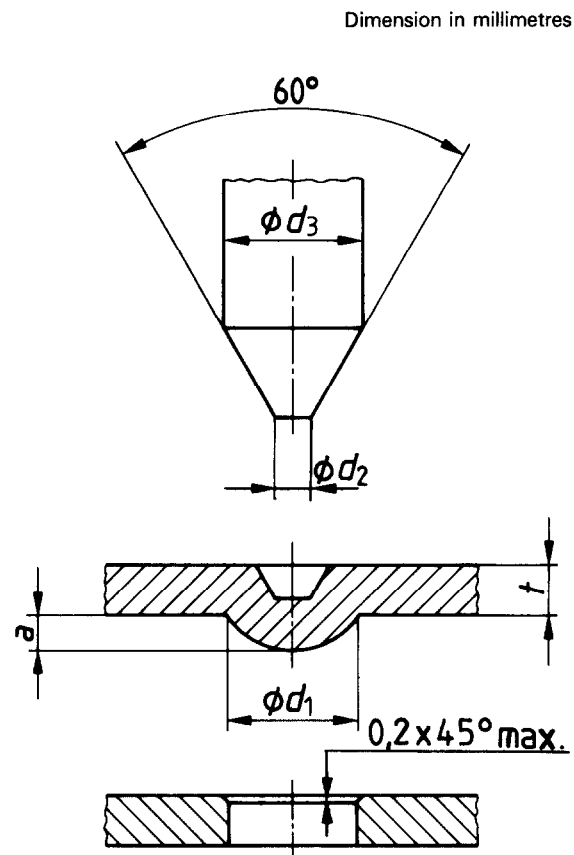
Table A.1 — Groups of projection diameters

Dimensions in millimetres

Sheet thickness <i>t</i>	Projection diameter, <i>d</i> ₁		
	Group A	Group B	Group C
<i>t</i> < 0,5	1,6	2	2,5
0,5 < <i>t</i> < 0,63	2	2,5	3,2
0,63 < <i>t</i> < 1	2,5	3,2	4
1 < <i>t</i> < 1,6	3,2	4	5
1,6 < <i>t</i> < 2,5	4	5	6,3
2,5 < <i>t</i> < 3	5	6,3	8

Annex B (informative)

Example of tool for forming projection



NOTE — $\phi d_3 > \phi d_1$; for other dimensions, see table 1. All unspecified dimensions to be produced within the relevant tolerances in accordance with ISO 286-1.

Figure B.1 — Tool dimensions

ISO 8167 : 1989 (E)

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Descriptors: welding, resistance welding, welded joints, dimensions, designation.

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