

INTERNATIONAL STANDARD

**ISO
9313**

First edition
1989-04-15

Resistance spot welding equipment — Cooling tubes

Matériel de soudage par points par résistance — Tubes de refroidissement



Reference number
ISO 9313 : 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 9313 was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*.

Resistance spot welding equipment — Cooling tubes

1 Scope

This International Standard specifies dimensions and tolerances of cooling tubes for resistance spot welding equipment.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were 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 editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 5183-1 : 1988, *Resistance spot welding — Electrode adaptors, male taper 1:10 — Part 1: Conical fixing, taper 1:10.*

ISO 5183-2 : 1988, *Resistance spot welding — Electrode adaptors, male taper 1:10 — Part 2: Parallel shank fixing for end-thrust electrodes.*

ISO 5184 : 1979, *Straight resistance spot welding electrodes.*

ISO 8430-1 : 1988, *Resistance spot welding — Electrode holders — Part 1: Taper fixing 1:10.*

ISO 8430-2 : 1988, *Resistance spot welding — Electrode holders — Part 2: Morse taper fixing.*

ISO 8430-3 : 1988, *Resistance spot welding — Electrode holders — Part 3: Parallel shank fixing for end thrust.*

3 Dimensions

The dimensions shall be those given in figure 1 and table 1.

Dimension *l* illustrated in figure 1 indicates the total length and may be selected by agreement between the purchaser and the manufacturer. To calculate the required length of cooling tube, see ISO 5183-1, ISO 5183-2, ISO 5184, ISO 8430-1, ISO 8430-2 and ISO 8430-3.

The end of the tube shall be cut off at an angle to ensure a sufficient flow of water.

Table 1 — Cooling tube dimensions

	Outside diameter, d_1 mm	Inside diameter, d_2 mm	Cut-off angle, α degrees
Type A (rigid)	$5 \pm 0,08$	4	60
Type B (flexible)	$5^{+0,3}_0$	4	1)
	$6^{+0,3}_0$	4,5 min.	1)

1) Not specified.

4 Designation

The designations of cooling tubes which comply with this International Standard shall comprise the following information in the order given:

- the description block (i.e. "cooling tube");
- a reference to this International Standard;
- the type of cooling tube (i.e. A or B);
- the outside diameter, in millimetres;
- the length, *l*, in millimetres.

Example: A type A cooling tube having an outside diameter of 5 mm and a length *l* = 50 mm shall be designated as follows:

Cooling tube ISO 9313 - A - 5 × 50

5 Materials

The cooling tube shall be made of brass or copper.

6 Marking

Cooling tubes which comply with this International Standard shall be marked with the designation laid down in clause 4, but excluding the description block and the reference to this International Standard, for example:

A - 5 × 50