

International Standard



8491

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Metallic materials — Tube (in full section) — Bend test

Matériaux métalliques — Tubes — Essai de cintrage sur tronçon

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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.

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 8491 was prepared by Technical Committee ISO/TC 164, *Mechanical testing of metals*.

It cancels and replaces ISO Recommendation R 167-1960, of which it constitutes a technical revision.

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Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

Metallic materials — Tube (in full section) — Bend test

1 Scope and field of application

This International Standard specifies a method for determining the ability of full-section metallic tubes of circular cross-section with an outside diameter not greater than 65 mm to undergo plastic deformation in bending. The range of the outside diameter for which this International Standard is applicable may be more exactly specified in the relevant standard.

Bend tests of the test pieces taken from tubes in the form of transverse strips shall be made in accordance with ISO 7438 so that the original curvature of the test piece is increased.

2 Principle

Bending a straight tube in full section around a grooved former of a specified radius r until the angle of bend α (see the figure) reaches the value specified in the relevant standard.

3 Symbols, designations and units

Symbols, designations and units for the bend test of tubes in full section are given in the figure and the table.

Table — Symbols, designations and units

Symbol	Designation	Unit
D	Outside diameter of the tube	mm
a	Wall thickness of the tube	mm
L	Length of the test piece before the test	mm
r	Inside radius at the bottom of the groove	mm
α	Angle of the bend	degree

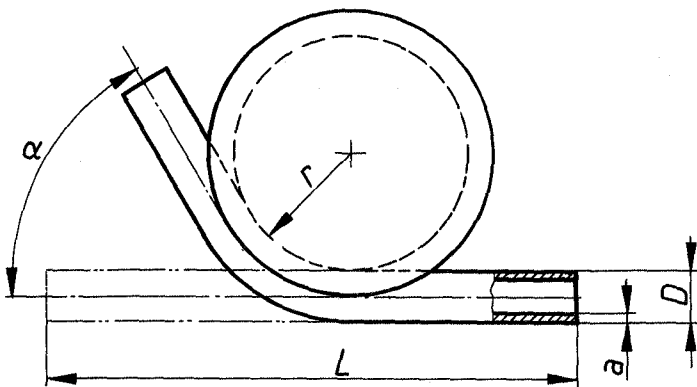


Figure — Symbols for bend test

4 Testing equipment

4.1 The bend test of tubes shall be carried out on tube bending machines designed to restrict the development of ovality of the section of tube.

4.2 The tube bend former of the machine shall have a groove corresponding in profile to the outside diameter of the tube. The radius r at the bottom of the groove shall be specified in the relevant standard.

NOTE — The tolerance of radius r and the depth and ovality of the groove all have an effect on the test result.

5 Test piece

The test piece shall be a portion of a straight tube of any length which will allow the test to be carried out on the tube bending machine.

6 Procedure

6.1 In general, the test shall be carried out at ambient temperature within the limits of 10 to 35 °C. The test carried out under controlled conditions shall be made at a temperature of 23 ± 5 °C.

6.2 Bend the unfilled test piece of the tube by means of a tube bending machine, ensuring contact between the test piece and the tube bend former over the length of bend, until the specified angle of bend is reached.

6.3 If welded tubes are subjected to the test, the position of the weld in relation to the plane of bending shall be as required by the relevant standard.

6.4 Interpretation of the bend test of tubes shall be carried out according to the requirements of the relevant standard. When these requirements are not specified, absence of cracks visible without the use of magnifying aids shall be considered as evidence that the test piece passed the test.

7 Test report

The test report shall include at least the following information:

- a) reference to this International Standard;
- b) identification of the test piece;
- c) dimensions of the test piece;
- d) angle of the bend α and radius r ;
- e) position of the weld in relation to the plane of bending, if relevant;
- f) result of the test.

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