BRITISH STANDARD

BS EN ISO
8491:2004

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

The European Standard EN ISO 8491:2004 has the status of a British Standard

ICS 77.040.10

BSI
British Standards

National foreword

This British Standard is the official English language version of EN ISO 8491:2004. It is identical with ISO 8491:1998. It supersedes BS EN 10232:1994 which is withdrawn.

The UK participation in its preparation was entrusted by Technical Committee ISE/NFE/4, Mechanical testing of metals, to Subcommittee ISE/NFE/4/2, Ductility testing, which has the responsibility to:

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Summary of pages

This document comprises a front cover, an inside front cover, the EN ISO title page, the EN ISO foreword page, the ISO title page, page ii, pages 1 to 3 and a back cover.

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EUROPEAN STANDARD

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EN ISO 8491

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Supersedes EN 10232:1993

English version

Metallic materials - Tube (in full section) - Bend test (ISO 8491:1998)

Matériaux métalliques - Tubes - Essai de cintrage sur tronçon (ISO 8491:1998)

Metallische Werkstoffe - Rohr (Rohrabschnitt) - Biegeversuch (ISO 8491:1998)

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Ref. No. EN ISO 8491:2004: E

Foreword

The text of ISO 8491:1998 has been prepared by Technical Committee ISO/TC 164 "Mechanical testing of metals" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 8491:2004 by Technical Committee ECISS/TC 29 "Steel tubes and fittings for steel tubes", the secretariat of which is held by UNI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2005, and conflicting national standards shall be withdrawn at the latest by January 2005.

This document supersedes EN 10232:1993.

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Endorsement notice

The text of ISO 8491:1998 has been approved by CEN as EN ISO 8491:2004 without any modifications.

INTERNATIONAL STANDARD

ISO 8491

Second edition
1998-11-01

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

Matériaux métalliques — Tubes — Essai de cintrage sur tronçon

Reference number
ISO 8491:1998(E)

Foreword

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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.

International Standard ISO 8491 was prepared by Technical Committee ISO/TC 164, *Mechanical testing of metals*, Subcommittee SC 2, *Ductility testing*.

This second edition cancels and replaces the first edition (ISO 8491:1986), of which it constitutes a technical revision.

Annex A of this International Standard is for information only.

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

1 Scope

This International Standard specifies a method for determining the ability of full-section metallic tubes of circular cross-section to undergo plastic deformation in bending. It is intended for tubes with an outside diameter no greater than 65 mm, although the range of the outside diameter for which this International Standard is applicable may be more exactly specified in the relevant product standard.

NOTE — Bend tests of the test pieces taken from tubes in the form of transverse strips should be made in accordance with ISO 7438 so as to increase the original curvature of the test piece.

2 Symbols, designations and units

Symbols, designations and units for the bend test of tubes in full section are given in table 1 and are shown in figure 1.

Table 1

Symbol	Designation	Unit
a [a]	Wall thickness of the tube	mm
D	Outside diameter 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

[a] The symbol T is also used in steel tube standards.

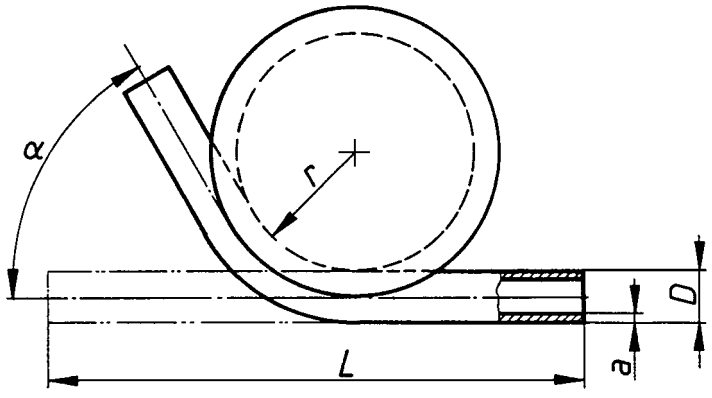

Figure 1

3 Principle

Bending a straight tube in full section around a grooved former of a specified radius r until the angle of bend α (see figure 1) reaches the value specified in the relevant product standard.

4 Testing equipment

4.1 Tube-bending machines, designed to prevent the section of the tube from becoming oval.

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

NOTE — The tolerance of radius r, 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 °C 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 shall be at 90° to the plane of bending i.e. the neutral axis, unless otherwise indicated in the relevant product standard.

6.4 Interpretation of the bend test of tubes shall be carried out in accordance with the requirements of the relevant product standard. When these requirements are not specified, the test piece shall be considered to have passed the test if no cracks are visible without the use of magnifying aids.

7 Test report

A test report shall be provided when so specified in the relevant product standard. In this case, the test report shall include at least the following information:

a) reference to this International Standard, i.e. ISO 8491;

b) identification of the test piece;

c) dimensions of the test piece;

d) angle of bend α and radius r;

e) position of the weld in relation to the plane of bending, if relevant;

f) result of the test.

Annex A
(informative)

Bibliography

[1] ISO 7438:1985, *Metallic materials — Bend test*.

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