INTERNATIONAL STANDARD

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Metallic materials — Bend test

Matériaux métalliques — Essai de pliage

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 164, *Mechanical testing of metals*, Subcommittee SC 2, *Ductility testing*.

This third edition cancels and replaces the second edition (ISO 7438:2005), which has been technically revised. The following changes have been made:

— Figure 3 has been revised;

— a note has been added in 4.2.2;

— Formula (A.4) and Figure A.1 have been revised.

Metallic materials — Bend test

1 Scope

This International Standard specifies a method for determining the ability of metallic materials to undergo plastic deformation in bending.

This International Standard applies to test pieces taken from metallic products, as specified in the relevant product standard. It is not applicable to certain materials or products, for example tubes in full section or welded joints, for which other standards exist.

2 Symbols and designations

Symbols and designations used in the bend test are shown in Figures 1 and 2 and specified in Table 1.

Table 1 — Symbols and designations

Symbol	Designation	Unit
a	Thickness or diameter of test piece (or diameter of the inscribed circle for pieces of polygonal cross-section)	mm
b	Width of the test piece	mm
L	Length of the test piece	mm
l	Distance between supports	mm
D	Diameter of the former	mm
α	Angle of bend	degrees
r	Internal radius of bend portion of test piece after bending	mm
f	Displacement of the former	mm
c	Distance between the plane including the horizontal axis of supports and the central axis of the rounded portion of the former before test	mm
p	Distance between the vertical planes including the central axis of each support and the vertical plane including the central axis of the former	mm
R	Radius of the supports	mm

3 Principle

The bend test consists of submitting a test piece of round, square, rectangular or polygonal cross-section to plastic deformation by bending, without changing the direction of loading, until a specified angle of bend is reached.

The axes of two legs of the test piece remain in a plane perpendicular to the axis of bending. In the case of a 180° bend, the two lateral surfaces may, depending on the requirements of the product standard, lie flat against each other or may be parallel at a specified distance, an insert being used to control this distance.