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ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION
R 87

SIMPLE BEND TESTING OF STEEL SHEET AND STRIP LESS THAN 3 mm THICK

1st EDITION
February 1959

For each individual country the only valid standard is the national standard of that country.

Printed in Switzerland

Also issued in French and Russian. Copies to be obtained through the national standards organizations.

BRIEF HISTORY

The ISO Recommendation R 87, *Simple Bend Testing of Steel Sheet and Strip Less than 3 mm Thick*, was drawn up by Technical Committee ISO/TC 17, *Steel*, the Secretariat of which is held by the British Standards Institution (B.S.I.).

The drawing up of an ISO Recommendation concerning this test was decided on at the second meeting of ISO/TC 17, held in New York, in June 1952. The Technical Committee instructed its Working Group No. 1, *Methods of Mechanical Testing for Steel*, to prepare a draft proposal which was circulated to the members of the Technical Committee in March 1954.

The comments of the Member Bodies were considered by the Working Group which submitted, in August 1954, a revised draft proposal to the members of ISO/TC 17. The revised draft proposal was discussed at the fourth plenary meeting of the Technical Committee, held in Stockholm, in June 1955, along with the comments of the Member Bodies, and was adopted, with a number of small amendments, as a Draft ISO Recommendation.

On 31 January 1957, the Draft ISO Recommendation (No. 152) was submitted to all the ISO Member Bodies and, subject to a few modifications, was approved by the following Member Bodies:

Austria	Hungary	Poland
*Bulgaria	*Ireland	Portugal
*Canada	Italy	Romania
Czechoslovakia	Japan	Spain
Denmark	Mexico	Sweden
Finland	*New Zealand	United Kingdom
Germany	Norway	U.S.S.R.
*Greece	Pakistan	

One Member Body opposed the approval of the Draft: France.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in February 1959, to accept it as an ISO RECOMMENDATION.

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* These Member Bodies stated that they had no objection to the Draft being approved.

ISO Recommendation R 87 February 1959

SIMPLE BEND TESTING OF STEEL SHEET AND STRIP LESS THAN 3 mm THICK

1. PRINCIPLE OF TEST

The test consists in submitting a straight test piece to plastic deformation by bending without reversing the direction of flexure during the test. The bending is carried out until one leg of the test piece makes, under load, a specified angle α with the extension of the other (see Fig. 2 below). The axes of the two legs of the test piece remain in a plane perpendicular to the axis of bending. In the case of 180° bend, the two lateral surfaces may, depending on the requirements of the specification, lie flat against each other or be parallel at a specified distance; an intermediate piece may be used for the control of this distance (see Fig. 4, page 4).

2. SYMBOLS AND DESIGNATIONS

Number	Symbol	Designation
1	a	Thickness of test piece
2	b	Width of test piece
3	—	Distance between supports (see Fig. 1 and 2)
4	α	Angle of bend
5	R	Radius of supports
6	D	Diameter of mandrel
7	r	Internal radius of bent portion of test piece after bending

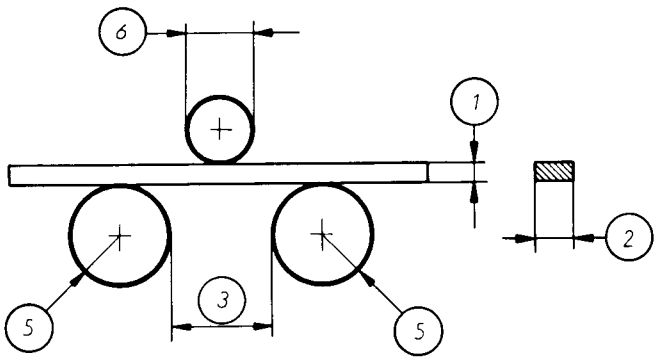

Fig. 1

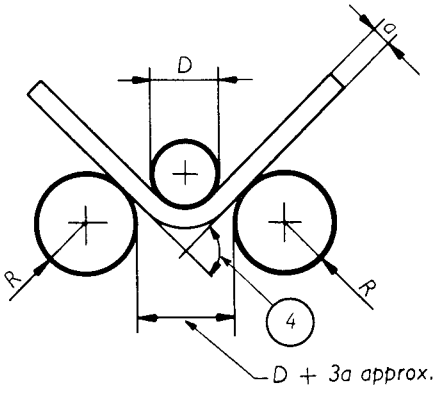

Fig. 2

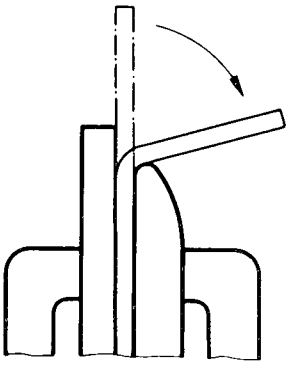

FIG. 3

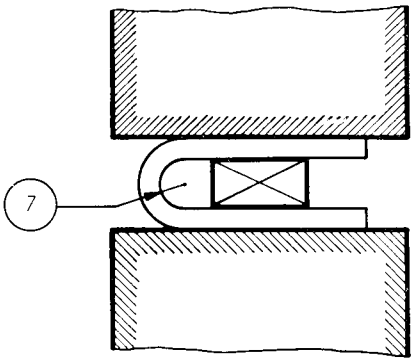

FIG. 4

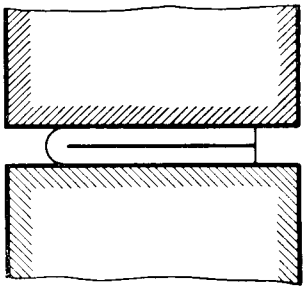

FIG. 5

3. TEST PIECE

3.1 The thickness of the test piece is that of the sheet from which the sample is taken, the skins remaining intact.

3.2 The width of the test piece is 20 mm $^{+\ 0}_{-\ 5}$ mm (13/16 in $^{+\ 0}_{-\ 3/16}$ in).

3.2.1. Strip material of a smaller width may be tested with the full width as supplied.

3.3 The test piece is prepared so that the edges are free from burrs and cracks. Cold-worked zones may be removed by machining or filing. However, the test will be acceptable, whether or not the edges have been prepared, provided the resultant bend is satisfactory.

4. PROCEDURE

4.1 The common method of carrying out the test includes the following operations:

4.1.1 Lay the test piece on two parallel supports and bend it in the middle by means of a mandrel (see Fig. 1 and 2, page 3);

4.1.2 Hold one end of the test piece between two blocks and bend the test piece over one of the blocks which is rounded to the specified radius (see Fig. 3), and of sufficient hardness.

4.1.3 The bending force is applied slowly, with the objective of permitting free plastic flow of the material.

4.2 The legs of the test piece may be, according to the material specification,

(*a*) brought to a specified angle (see Fig. 2, page 3),

(*b*) brought parallel to each other at a given distance apart (see Fig. 4), or

(*c*) brought into contact with each other (see Fig. 5).

5. TEST REQUIREMENTS

5.1 The test is carried out at ambient temperature, unless otherwise specified.

5.2 After bending, the outside of the bent portion should be examined.

5.3 The interpretation of the appearance of the outside of the bent portion is a matter for the material specification.

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