

ISO

26

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION R 1556

COPPER AND COPPER ALLOY TUBES
OF CIRCULAR SECTION

FLATTENING TEST
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**COPPER AND COPPER ALLOY TUBES
OF CIRCULAR SECTION
FLATTENING TEST**

1. SCOPE

This ISO Recommendation describes a flattening test for copper and copper alloy tubes having an external diameter less than or equal to 100 mm (4 in), and a thickness less than or equal to 15 % of the external diameter. However, individual specifications for the material may specify the maximum diameter and thickness of tube to which this test is to be applied in particular circumstances.

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2. PRINCIPLE

- 2.1 The test consists of flattening between platens a specified length of tube in a direction perpendicular to the longitudinal axis of the tube until the distance between the platens, measured under load, reaches the value fixed by the relevant product specification.
- 2.2 When the test is carried out in such a way that, after the test, the internal surfaces are in contact over more than half the internal surface area, the test is called "close flattened".
- 2.3 The test should be carried out at ambient temperature unless otherwise specified.

3. SYMBOLS AND DESIGNATIONS

Number	Symbol	Designation
1	D	External diameter of test piece
2	a	Thickness of wall of test piece
3	d	Internal diameter of test piece
4	L	Length of test piece
5	z	Distance between platens measured under load

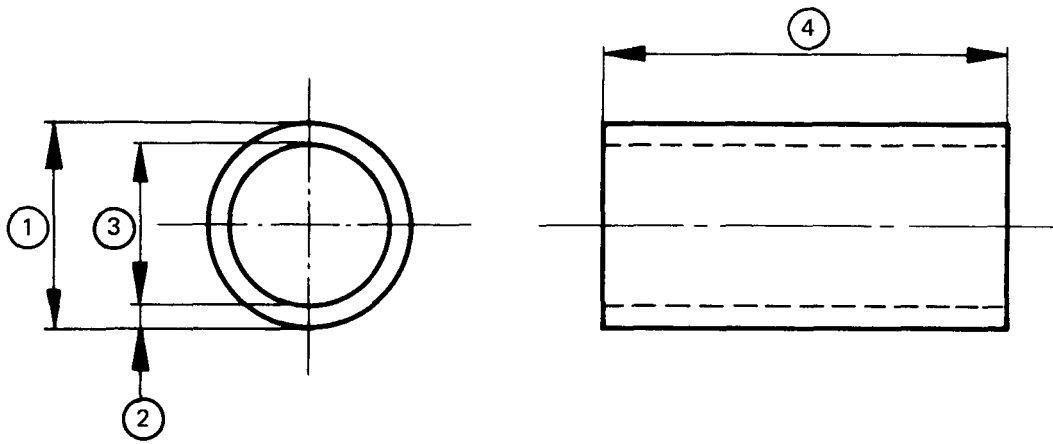


FIGURE 1 – Test piece

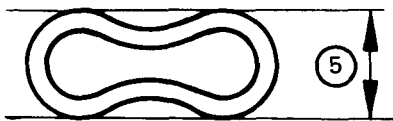


FIGURE 2 – Distance between platens measured under load

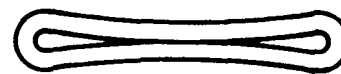


FIGURE 3 – Close flattened test piece

4. TEST PIECE

- 4.1 The test piece should consist of a length of tube with the ends perpendicular to the longitudinal axis of the tube.
- 4.2 The length L should be approximately equal to 1.5 times the external diameter, but not less than 10 mm, nor more than 100 mm.
- 4.3 The test may be made on the end of the tube, and unless otherwise required by the specification for the product, the length subjected to the test should then be the length L defined above.
- 4.4 The cut ends of the test piece may be rounded by filing. However, a test on a test piece the edges of which have not been rounded should be acceptable, provided the requirements of the product specification are met.

5. PROCEDURE

- 5.1 Place the test piece between two plane, parallel, rigid platens extending over the length L , and the width of the tube after flattening (i.e. at least $1.6 D$). In the case of welded tubes, care should be taken to ensure that the weld is in the position required by the specification for the product. Flatten the test piece by closing the platens in the direction normal to their working surfaces.
- 5.2 In cases of dispute, the rate of movement of the platens should not exceed 25 mm/min.

6. TEST REPORT

The test report should include the following particulars :

- (a) the reference of the method used;
- (b) the results and the method of expression used;
- (c) any unusual features noted during the test;
- (d) any operation not included in this ISO Recommendation, or regarded as optional.

NOTE. – The degree of flattening and the interpretation of the appearance of the test piece, after testing, are matters for the specification for the product.

BRIEF HISTORY

The ISO Recommendation R 1556, *Copper and copper alloy tubes of circular section – Flattening test*, was drawn up by Technical Committee ISO/TC 26, *Copper and copper alloys*, the Secretariat of which is held by the Deutscher Normenausschuss (DNA).

Work on this question led to the adoption of Draft ISO Recommendation No. 1556, which was circulated to all the ISO Member Bodies for enquiry in March 1968.

The Draft was approved, subject to a few modifications of an editorial nature, by the following Member

Australia	Iran	Sweden
Belgium	Israel	Switzerland
Canada	Italy	Thailand
Chile	Netherlands	Turkey
Finland	Norway	United Kingdom
France	Poland	U.S.A.
Germany	South Africa, Rep. of	Yugoslavia
India	Spain	

No Member Body opposed the approval of the Draft.

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