

ISO

26

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION

R 1556

COPPER AND COPPER ALLOY TUBES

OF CIRCULAR SECTION

FLATTENING TEST

1st EDITION

August 1971

ISO 8492

COPYRIGHT RESERVED

The copyright of ISO Recommendations and ISO Standards belongs to ISO Member Bodies. Reproduction of these documents, in any country, may be authorized therefore only by the national standards organization of that country, being a member of ISO.

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.

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.

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

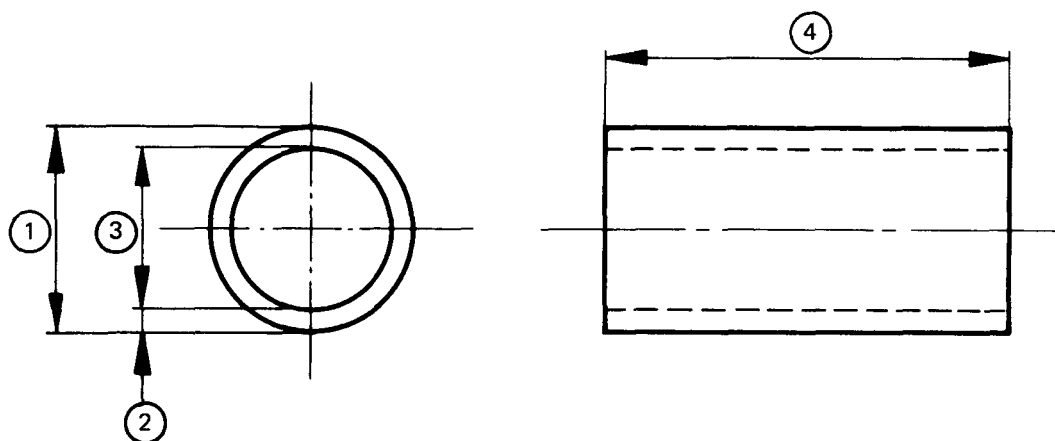


FIGURE 1 – Test piece

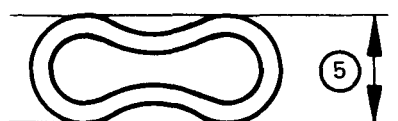


FIGURE 2 – Distance between platens measured under load

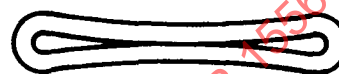


FIGURE 3 – Close flattened test piece

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.