
INTERNATIONAL STANDARD



2627

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Copper and copper alloys – Simple torsion testing of wire

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up 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.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 2627 was drawn up by Technical Committee ISO/TC 26, *Copper and copper alloys*, and circulated to the Member Bodies in November 1971.

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It has been approved by the Member Bodies of the following countries :

Austria	India	Sweden
Belgium	Japan	Switzerland
Canada	Netherlands	Thailand
Czechoslovakia	New Zealand	Turkey
Chile	Norway	United Kingdom
Egypt, Arab Rep. of	Portugal	U.S.A.
France	Romania	U.S.S.R.
Germany	South Africa, Rep. of	
Hungary	Spain	

No Member Body expressed disapproval of the document.

Copper and copper alloys – Simple torsion testing of wire

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a method for the simple torsion testing of copper and copper alloy wire of nominal sizes of 0,5 mm (0.02 in) and greater.

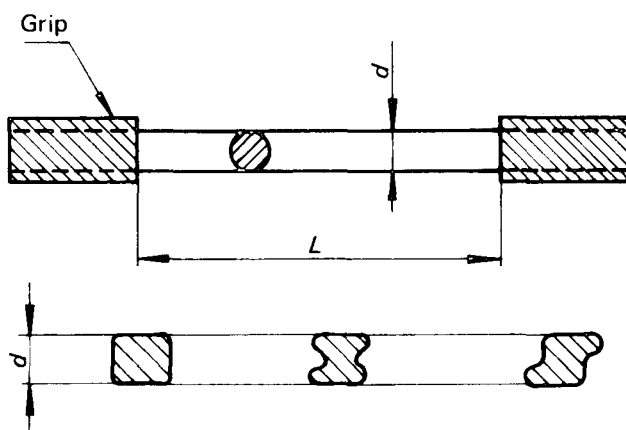
2 PRINCIPLE

The test consists of twisting a specified length of a test piece around its own axis until the test piece breaks or until a specified number of twists has been made. The twisting is in one direction only during the test.

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

3 SYMBOLS AND DESIGNATIONS

Symbol	Designation
d	Nominal size of wire
L	Free length between grips
N_t	Number of turns



4 TESTING MACHINE

4.1 The grips of the testing machine shall be arranged in such a way that, during testing, they remain on the same axis and do not apply any bending to the test piece.

4.2 The machine shall be so constructed that the change of length between the grips during the test is not prevented.

4.3 One of the grips shall be capable of being rotated around the axis of the test piece while the other shall not be subject to any angular deflection, except for such deflection as may be necessary to measure the torque.

5 TEST PIECES

The test piece, consisting of a piece of wire, shall preferably be straight before testing. If straightening is necessary, it shall, unless otherwise specified, be done by hand, or if this is not possible, a wooden hammer shall be used. The free length between the grips of the machine shall be as follows:

Nominal size, d				Free length between grips L
equal to and over		up to but not including		
mm	in	mm	in	
0,5	0,02	1	0,04	$200 d$
1	0,04	5	0,2	$100 d^{1)}$
5	0,2	10	0,40	$50 d^{2)}$
10	0,40	—	—	$25 d^{3)}$

1) $50 d$ by special arrangement when the machine will not permit the use of a length equal to $100 d$.

2) $30 d$ by special arrangement when the machine will not permit the use of a length equal to $50 d$.

3) 250 mm, by special arrangement.

6 PROCEDURE

6.1 The test piece shall be placed in the machine in such a way that its longitudinal axis coincides with the axis of the grips and so that it remains straight during the test. Unless otherwise specified, this may be ensured by applying to the test piece a constant tensile stress just sufficient to straighten it, but not exceeding 5 % of the nominal tensile strength of the wire.

6.2 After placing the test piece in the machine, one grip shall be rotated at a reasonably constant speed until the test piece breaks or until the specified number of turns is reached. The number of complete turns imparted to the wire by the rotating grip shall be counted.

6.3 The speed of testing shall be sufficiently slow to prevent any rise in temperature likely to affect the result of the test. In any case it shall not exceed the following :

Nominal size, <i>d</i>				Maximum speed of testing (turns/second)
equal to and over		up to but not including		
mm	in	mm	in	
—	—	1	0.04	5
1	0.04	1,5	0.06	2
1,5	0.06	3	0.12	1,5
3	0.12	5	0.20	1 for length of 100 <i>d</i> 0,5 for length of 50 <i>d</i>
5	0.20	10	0.40	0,5 for length of 50 <i>d</i> 0,35 for length of 30 <i>d</i>
10	0.40	—	—	0,35

7 TEST REQUIREMENTS

7.1 If the number of turns is satisfactory, the test piece is considered as having passed the test, irrespective of the position of failure. If the number of turns reached does not satisfy the requirements of the specification, and if the failure is within 2 *d* of the grips, the test is to be considered as invalid and is to be repeated.

7.2 If so required by the specification for the material, the surface of the test piece, including the fracture, should be examined. The method of examination and the interpretation of the appearance of the test piece are matters for the material specification.

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