
INTERNATIONAL STANDARD



3178

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Steel wire ropes for general purposes — Terms of acceptance

Câbles en acier d'usages courants — Conditions de réception

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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 3178 was drawn up by Technical Committee ISO/TC 105, *Steel wire ropes*, and circulated to the Member Bodies in September 1973.

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

Austria	Ireland	Switzerland
Belgium	Israel	Thailand
Bulgaria	New Zealand	Turkey
Egypt, Arab Rep. of	Poland	United Kingdom
Finland	Romania	U.S.S.R.
France	South Africa, Rep. of	Yugoslavia
Germany	Spain	
India	Sweden	

The Member Bodies of the following countries expressed disapproval of the document on technical grounds :

Italy
Netherlands

Steel wire ropes for general purposes – Terms of acceptance

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies the terms of acceptance for steel wire ropes for general purposes as specified in ISO 2408.

2 REFERENCES

ISO 89, *Steel – Tensile testing of wire.*

ISO 136, *Steel – Simple torsion testing of wire.*

ISO 144, *Steel – Reverse bend testing of wire.*

ISO 2232, *Drawn wire for general purpose non-alloy steel wire ropes – Specifications.*

ISO 2408, *Steel wire ropes for general purposes – Characteristics.*

ISO 3108, *Steel wire ropes for general purposes – Determination of actual breaking load.*

3 GENERAL

The number of test pieces to be taken from each batch and the types of test to be carried out shall be agreed between the interested parties.

If inspection by sampling is agreeable to the two parties, the number of test pieces may be that given in table 3 of annex A.

4 TESTS ON ROPE

4.1 Diameter and tolerances

4.1.1 The nominal diameter of the rope shall be one of those given in clause 6 of ISO 2408.

4.1.2 The actual diameter of the rope shall be within the total tolerances given in ISO 2408.

4.1.3 The actual diameter shall be measured with a suitable caliper fitted with jaws broad enough to cover not less than two adjacent strands.

The measurements shall be taken on a straight portion of the rope without tension, at two points spaced at least 1 m apart, and at each point the two diameters at right angles shall be measured.

The average of these four measurements shall be within the tolerances specified by reference to the nominal diameter.

4.1.4 The measurements for ovality (out-of-roundness) shall be taken in accordance with 4.1.3. The maximum variation between any of the four measurements shall not exceed the values given in table 1.

TABLE 1

1 Nominal diameter mm	2 Permissible ovality on nominal diameter in %	
	3 Ropes with strands exclusively of wire	4 Ropes with fibre strand cores
2 and 3	7	—
4 and 5	6	8
6 and 7	5	7
8 and over	4	6

4.1.5 In case of dispute the diameter may be measured under a force of approximately 5 % of the minimum breaking load of the rope.

4.2 Breaking load

The actual breaking load of the rope shall be not less than the minimum breaking load given in ISO 2408 when measured in accordance with the method given in ISO 3108.

5 TESTS ON WIRES FROM THE ROPE

When specified by the purchaser on the enquiry and order, tests of wires from each production length shall be carried out in respect of diameter, tensile strength, torsions, bends and, when necessary, galvanizing.

5.1 Material

The material must comply with ISO 2232 subject to the acceptance levels given in 5.4.

5.2 Sampling

In order to obtain wire test pieces, a suitable length shall be cut from the rope and the wires unlaidd.

In the case of six- and eight-strand ropes, the number of test wires of equal nominal diameter shall be equal to the number of wires of that diameter in one strand. The wires to be tested shall be selected at random from all the main strands of the rope.

In the case of multistrand ropes, the number of test pieces shall be in accordance with table 2.

TABLE 2

1	2	3	4
Rope designation	Number of wires for testing		
	outer strands	intermediate strands	inner strands
17 x 7	11	—	6
18 x 7	12	—	6
34 x 7	17	11	6
36 x 7	18	12	6

The samples of wire taken for tests shall normally not include filler wires, core wires or wires from a steel main core. (Wires from the steel main cores of eight-strand ropes may be excluded from this provision.)

For the purposes of evaluating the test results, the rope manufacturer shall specify, at the request of the purchaser, the nominal diameters of the wires.

5.3 Methods of test

The methods of testing for wire diameter, tensile strength, torsions, reverse bends and galvanizing shall be the same as those described in ISO 2232.

Attention is drawn to ISO 89 and ISO 136 on the subject of straightening the wires.

5.4 Levels of acceptance

5.4.1 Tensile test

At least 95 %¹⁾ of the wires tested shall comply with the requirement of the appropriate tensile grade as detailed in ISO 2232, subject to a reduction of not more than 50 N/mm².

5.4.2 Torsion test

At least 95 %¹⁾ of the wires tested shall comply with the appropriate requirements of ISO 2232 except that the minimum number of torsions may be 75 % (to the nearest whole number of torsions above) of those specified.

5.4.3 Reverse bend test

At least 95 %¹⁾ of the wires tested shall comply with the appropriate requirements of ISO 2232 except that the minimum number of reverse bends may be 80 % (to the nearest whole number of bends above) of those specified.

5.4.4 Tensile test on knotted wire

For wires having a diameter of less than 0,5 mm, the bending and torsion tests shall be replaced by the tensile test on knotted wire. At least 95 %¹⁾ of the wires tested shall comply with the appropriate requirements of ISO 2232.

5.4.5 Galvanizing test

At least 95 %¹⁾ of the wires tested shall comply with the requirements of ISO 2232 in respect of the tests for mass of coating.

5.4.6 Retests

These shall be carried out only when the original test resulted in failure and shall be agreed between the interested parties.

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6 CERTIFICATES

The following types of certificate may be used :

6.1 Works Certificate

This will acknowledge, if required, the conditions specified in the purchase order. (An example of a Works Certificate is given in annex B.)

6.2 Full Works Certificate

This shall give the results of the tests requested by the purchaser in his order. It will be supplied on request. (An example of a Full Works Certificate is given in annex C.)

6.3 Certificate of Acceptance

This shall be used when tests are carried out in the presence of the purchaser or his representative after manufacture, or in a laboratory designated by the purchaser. (An example of a Certificate of Acceptance is given in annex C.)

7 FACILITIES FOR INSPECTION

7.1 When so specified by the purchaser, the manufacturer shall give the purchaser or his representative all reasonable facilities to carry out the tests in order to ensure that the rope and its components are in accordance with this International Standard.

1) To the nearest whole number below.

7.2 Unless otherwise agreed, all tests and inspection shall be made at the works of the manufacturer before dispatch.

7.3 Test lengths required for acceptance testing shall be ordered as additional lengths.

8 PACKAGING

Unless specified by the purchaser, ropes shall be supplied in coils or on reels at the discretion of the manufacturer.

The rope shall be protected in transit against moisture, dust and dirt.

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ANNEX A

INSPECTION BY SAMPLING FOR WIRE ROPES

A.1 INTRODUCTION

The sampling may be the subject of an agreement between the interested parties. If no agreement can be reached, the batch size shall be that number of coils (reels) presented for acceptance.

other coils (reels) of the batch, in accordance with column 3 of table 3. The batch conforms if all additional tests are satisfactory.

If one or more of the additional tests give an unsatisfactory result, all coils (reels) of the batch shall be tested and all coils (reels) failing shall be rejected.

A.2 SAMPLING

Determine, by using table 3, the number of samples (n) in relation to the batch size (N). If the number of samples selected in this way is less than the number of production lengths, then the latter shall be taken as the sample size.

For each characteristic appearing in clauses 4 and 5, carry out n tests.

TABLE 3

1	2	3
Batch size N	Number of samples n	Number of samples for the additional tests
1	1	—
2	2	—
3	3	—
4	3	1
5	3	2
6 to 15	3	3
16 to 25	4	4
26 to 40	5	5
41 to 65	7	7
66 to 110	10	10
111 to 180	15	15
181 to 300	20	20

A.3 CONFORMITY

The batch conforms if all the tests give a satisfactory result.

If one or more of the samples fail, make a retest on the same coils (reels). The batch conforms if the retest gives a satisfactory result.

If the result is unsatisfactory, reject the coils (reels) from which the retest has been taken and, if the batch size is greater than three, make additional tests on samples from

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ANNEX B

EXAMPLE OF A WORKS CERTIFICATE FOR WIRE ROPES

WORKS CERTIFICATE

Manufacturer :

Purchaser :

Order number :

Nominal diameter : mm

Length : m

Construction :

Tensile grade of wire : N/mm²

Surface finish of the wires : iTeh STANDARD PREVIEW

Minimum breaking load : (standards.iteh.ai) kN

Mass : ISO 3178:1974 kg/100 m

Total mass : <https://standards.iteh.ai/catalog/standards/sist/8da82dbb-6bab-4c5b-9343-ed28dd47a38/iso-3178-1974> kg

Date of delivery :

Coil/reel No. :

Remarks :

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It is certified that the above-mentioned rope conforms to ISO 3178.

Place, Date Signed (Stamp)

ANNEX C

EXAMPLE OF A FULL WORKS CERTIFICATE OR A CERTIFICATE OF ACCEPTANCE FOR WIRE ROPES

FULL WORKS CERTIFICATE OR CERTIFICATE OF ACCEPTANCE

Manufacturer :

Purchaser :

Order number :

Nominal diameter : mm

Actual diameter of rope : mm

Length : m

Construction :

Type and direction of lay :

Tensile grade of wire : N/mm²

Surface finish of the wires :

Actual breaking load : kN

Coil/reel No. :

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1	2	3	4	5	6	7
Number of wire	Nominal wire diameter ¹⁾	Measured diameter of wire	Breaking load ²⁾	Tensile strength	Number of bends ³⁾	Number of torsions ⁴⁾
	mm	mm	kN	N/mm ²		

- 1) Specified by the manufacturer.
- 2) Tensile test according to ISO 89.
- 3) Reverse bend test according to ISO 144.
- 4) Torsion test according to ISO 136.

It is certified that this rope conforms to ISO 3178.

Place, Date Signed (Stamp)