

Steel wire and wire products — Steel wire for ropes —

Part 1: General requirements

The European Standard EN 10264-1:2002 has the status of a British Standard

ICS 77.140.65

National foreword

This British Standard is the official English language version of EN 10264-1:2002. Together with BS EN 10264-2:2001 and BS EN 10264-3 it supersedes BS 2763:1982, which will be withdrawn when BS EN 10264-3 is published.

The UK participation in its preparation was entrusted to Technical Committee ISE/26, Steel wire, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

This British Standard, having been prepared under the direction of the Engineering Sector Policy and Strategy Committee, was published under the authority of the Standards Policy and Strategy Committee on 18 April 2002

Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 10, an inside back cover and a back cover.

The BSI copyright date displayed in this document indicates when the document was last issued.

Amendments issued since publication

Amd. No.	Date	Comments

English version

Steel wire and wire products - Steel wire for ropes - Part 1: General requirements

Fils et produits tréfilés en acier - Fils pour câbles - Partie 1:
Prescriptions générales

Stahldraht und Drahterzeugnisse - Stahldraht für Seile -
Teil 1: Allgemeine Anforderungen

This European Standard was approved by CEN on 20 January 2002.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

	page
Foreword	3
1 Scope	4
2 Normative references	4
3 Terms and definitions.....	4
4 Information to be supplied by the client.....	5
5 Characteristics of and requirements for wire	5
5.1 Diameter tolerances.....	5
5.2 Tensile strength	5
5.2.1 Tensile strength grade - permitted variations.....	5
5.2.2 Procedure for tensile test.....	6
5.3 Reverse bend test	6
5.4 Torsion test.....	6
5.5 Tensile test on knotted wire.....	6
5.6 Coatings.....	6
6 Inspection documents	6
6.1 General.....	6
6.2 Certificate of compliance with order “2.1’	6
6.3 Specific inspection certificate “3.1.b”	6
6.4 Specific inspection certificate “3.1 .c”	7
6.5 Acceptance report “3.2”	7
7 Sampling and compliance criteria.....	7
8 Marking	7
9 Protection against corrosion and type of packaging.....	8
Annex A (informative) Definition of terms relating to sampling and acceptance	9
A.1 Batch	9
A.2 Unit, production unit.....	9
A.3 Base unit for sampling (m_1)	9
A.4 Size of batch (N).....	9
A.5 Sample for testing.....	10
A.6 Sampling length	10
A.7 Sampling	10
A.8 Sample size (n).....	10
A.9 Defect	10
A.10 Defective length	10

Foreword

This document (EN 10264-1:2002) has been prepared by Technical Committee ECISS/TC 30 "Steel wires", the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2002, and conflicting national standards shall be withdrawn at the latest by September 2002.

This European Standard for wire for ropes is made up of the following parts:

Part 1 : General requirements

Part 2 : Cold drawn non alloy steel wire for ropes for general applications

Part 3 : Cold drawn and cold shaped non alloy steel wire for high duty applications

Part 4 : Stainless steel wire

Annex A is informative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

EN 10264-1:2002 (E)

1 Scope

This part of this European Standard defines the general requirements for wire intended for mechanical ropes. Additional requirements are given in the following parts of this standard, which are specific to each category of wire.

This standard specifies

- dimensional tolerances
- mechanical characteristics
- requirements relating to the chemical composition of the steel wire
- conditions to be satisfied by any coating.

2 Normative references

This European Standard incorporates by dated or undated reference provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 10021, *General technical delivery requirements for steel and iron products.*

EN 10204, *Metallic products — Types of inspection documents.*

EN 10264-2, *Steel wire and wire products — Steel wire for ropes — Part 2: Cold drawn non alloy steel wire for ropes for general applications.*

prEN 10264-3, *Steel wire and wire products — Steel wire for ropes — Part 3: Cold drawn and cold shaped non alloy steel wire for high duty applications.*

prEN 10264-4, *Steel wire and wire products — Steel wire for ropes — Part 4: Stainless steel wire.*

EN 10218-1, *Steel wire and wire products — General — Part 1: Test methods.*

EN 10218-2, *Steel wire and wire products — General — Part 2: Wire dimensions and tolerances.*

EN 10244-2, *Steel wire and wire products — Non ferrous metallic coatings on steel wire — Part 2: Zinc or zinc alloy coatings.*

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1

nominal diameter d

expressed in millimetres and specified by the purchaser is used to designate the wire. It is the basis for the determination of the values of all the characteristics of the wire for acceptance purposes

3.2

actual diameter

arithmetic mean of the perpendicular measurements on one section, in accordance with EN 10218-1

3.3

out of roundness

arithmetic difference between the maximum diameter and the minimum diameter measured perpendicularly on one section of wire

4 Information to be supplied by the client

In the order, the purchaser shall specify clearly the product, the delivery conditions and the type of inspection document to be supplied.

The product is clearly defined by the designations described in prEN 10264 parts 2, 3 and 4.

For a clear definition of a delivery of rope wire, the following additional information should be given:

- mass and length of delivery (total mass);
- unit mass;
- type of packaging.

5 Characteristics of and requirements for wire

5.1 Diameter tolerances

All the diameter values measured in accordance with EN 10218-2 on one section of wire shall be within the tolerance limits given in the respective tables. The level of tolerance corresponds to level T4 of EN 10218-2 for drawn wire and level T1 for class A coated wire. The out of roundness shall not be greater than half the tolerance specified in the respective tables referred to in prEN 10264 parts 2, 3 and 4.

5.2 Tensile strength

5.2.1 Tensile strength grade - permitted variations

The tensile strength grades are specified in prEN 10264 parts 2, 3 and 4. These values are the lower limits for tensile strength of each grade. The permitted upper limit for non alloy steel wire for ropes for each grade shall not exceed the lower limit by a value greater than the values given in Table 1.

Table 1 — Permitted tensile strength variations

Nominal dimension wire diameter : d or profile : h mm	Permitted plus tolerance over the numerical value of tensile strength grade MPa ^a
$0,2 \leq d < 0,5$	390
$0,5 \leq d < 1,0$	350
$1,0 \leq d < 1,5$	320
$1,5 \leq d < 2,0$	290
$2,0 \leq d < 3,5$	260
$3,5 \leq d < 8,0$	250
^a 1 MPa = 1N/mm ²	

In the case of alloy steel wire for ropes, the maximum value shall not be greater than the minimum value plus 15 %.

EN 10264-1:2002 (E)

5.2.2 Procedure for tensile test

The tensile test shall be carried out in accordance with EN 10218-1. The loading rate may be greater than that specified in EN 10218-1, depending on the number of tests to be carried out for the batch inspection. However, it shall not exceed the rate corresponding to a 25% elongation between anchorage heads in 1 min. The length of the test sample should preferably be such that the distance between the clamping jaws of the test machine is around 100 mm. In the event of a dispute, the tensile test shall be carried out strictly in accordance with EN 10218-1, in particular with regard to the loading rate.

5.3 Reverse bend test

This test is specified for steel wire for ropes as specified in prEN 10264 parts 2 and 3 with a diameter greater than 0,5 mm. It shall be carried out in accordance with EN 10218-1.

5.4 Torsion test

This test applies only to non alloy steel wire, of diameter greater than or equal to 0,5 mm. It shall be carried out in accordance with EN 10218-1. The wire shall show no signs of breaking for a minimum number of turns as specified in prEN 10264 parts 2 and 3.

5.5 Tensile test on knotted wire

This test replaces the alternate bending and torsion tests for dimensions below 0,50 mm. It is a tensile test on a wire with a simple knot in the middle. This test shall be carried out in accordance with EN 10218-1.

5.6 Coatings

The coatings generally used are zinc and zinc alloy. The standard coatings are classes A and B in accordance with EN 10244-2. If another class of coating is requested or if other metallic coatings are required, these shall be the subject of agreement at the time of ordering. The coating method is not specified. The class of the coating is defined by the minimum mass per unit of surface area (usually g/m²) and its adherence.

The mass of coatings shall be in accordance with the requirements specified in prEN 10264 parts 2 and 3.

6 Inspection documents

6.1 General

In accordance with the purchaser's order, one of the following inspection documents may be drafted in accordance with EN 10204.

6.2 Certificate of compliance with order "2.1"

In this certificate the supplier attests that the products supplied comply with the order specifications.

6.3 Specific inspection certificate "3.1.b"

This document gives the values of characteristics measured during the tests carried out by the supplier in accordance with this European Standard.

It shall be issued by the department independent of the manufacturing department and validated by the authorised representative of the staff independent of the manufacturing department.

6.4 Specific inspection certificate “3.1 .c”

This document gives the values of characteristics measured during the tests carried out by the supplier in accordance with this European Standard.

It is issued and validated by an authorised representative of the purchaser, in accordance with the specifications of the order.

6.5 Acceptance report “3.2”

In some specific cases, the tests and inspections are carried out or supervised by hierarchically authorized staff independent of the manufacture process. Inspection reports resulting from such circumstances and based on specific tests are referred to as “inspection certificates”. If, further to a special agreement, the inspection certificate is validated by the supplier’s authorized representative and the purchaser’s authorized representative, it is referred to as an acceptance report “3.2”.

7 Sampling and compliance criteria

These parameters shall satisfy the requirements of EN 10021.

The sampling plan and the assessment of the results of the tests carried out by the supplier shall be agreed upon between the supplier and the purchaser.

If the rope manufacturer wants acceptance tests to be carried out, the sample sizes and acceptance criteria shall be in accordance with the requirements of Table 2. To ensure representative sampling, the samples shall be taken at random.

If the number of non-complying results is greater than that defined in the 3rd column of Table 2, all the units (product units) shall be 100 % inspected, but only with regard to the defective characteristic(s).

If one or more of these new tests prove unsatisfactory, the non-complying units shall be rejected.

The acceptance or rejection of a non-complying batch shall be decided by agreement between the parties involved.

Table 2 — Size of batches and samples and number of defective results

Size ^a		Number for defective results for:	
of batch	of sample	Compliance	Non-compliance
N	n^b		
$2 \leq N \leq 15$	8	0	1
$16 \leq N \leq 50$	13	0	1
$51 \leq N \leq 90$	20	1	2
$91 \leq N \leq 150$	32	1	2
$151 \leq N \leq 280$	50	2	3
$281 \leq N < 500$	80	3	4
^a The definition of batch size and sample size is given in annex A.			
^b If the batch size is less than n , a test shall be carried out on each unit.			

8 Marking

Each unit supplied shall be marked and identified by a durable label, attached firmly to the wire coil or reel, indicating clearly as a minimum the information given in Table 3.

Table 3 — Marking of products ^a

Item type	non-alloy	stainless steel
	steel wire	wire
designation	+	+
producer	+	+
nominal dimension	+	+
tensile strength grade	+	+
surface condition	+	-
grade of steel	-	+
cast number	-	+
order number	+	+
identification number ^b	+	+
mass or length per unit supplied	(+)	(+)
^a Meaning of symbols used +: the product shall be marked (+): the product shall be marked if requested - : the product does not need to have this marking		
^b If requested by the purchaser, the marking shall be such as to ensure traceability and shall contain reference to the inspection documents		

9 Protection against corrosion and type of packaging

Unless otherwise agreed, the wire shall be shipped unpackaged, with the ends firmly attached and apart from the reels, the units shall be encircled by at least three binders.

When the transport and shipping conditions require special protection against possible mechanical, corrosive or other deterioration, the two parties shall define adequate packaging.

In particular in the case of bright, zinc or zinc alloy coated wire, when protection against rust is requested, the two parties shall define the appropriate anti-corrosive protection to be used.

Annex A (informative)

Definition of terms relating to sampling and acceptance

A.1 Batch

A defined quantity of wire of the same diameter, the same grade, the same finish presented for inspection and manufactured in conditions assumed to be identical and uniform.

A.2 Unit, production unit

- coil of a single length of wire, the mass or length of which may be variable, fixed, or;
- reel : variable or fixed quantity of a single length of wire wound on a reel or;
- flat coil : variable or fixed quantity of a single length of wire wound on a cardboard drum;
- other wire packaging : variable or fixed quantity of a single length of wire.

A.3 Base unit for sampling (m_1)

A mass expressed in kilograms conventionally with a value equal to $100 d$, where “ d ” is the diameter of the wire expressed in mm.

A.4 Size of batch (N)

Number given by the formula

$$N = \frac{m}{10^{-3} \times m_1}$$

where

m is the mass of the batch in tonnes

m_1 is the mass of the base unit in kilograms

Knowing that conventionally

$$m_1 = 100d$$

where “ d ” is the nominal diameter of the wire.

EN 10264-1:2002 (E)

It follows that

$$N = \frac{m}{10^{-3} \times 100d}$$

$$= \frac{10m}{d}$$

A.5 Sample for testing

A sufficient length of wire for measurement of a characteristic.

A.6 Sampling length

A sufficient length of wire to produce the necessary samples for testing all characteristics.

A.7 Sampling

Taking all necessary samples to supply information on the batch.

A.8 Sample size (*n*)

Number of samples for tests.

A.9 Defect

Result of a test not complying with the requirements for a characteristic.

A.10 Defective length

A sample length showing one or more defects.

BSI — British Standards Institution

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover. Tel: +44 (0)20 8996 9000. Fax: +44 (0)20 8996 7400.

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Buying standards

Orders for all BSI, international and foreign standards publications should be addressed to Customer Services. Tel: +44 (0)20 8996 9001. Fax: +44 (0)20 8996 7001. Email: orders@bsi-global.com. Standards are also available from the BSI website at <http://www.bsi-global.com>.

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Library and its Technical Help to Exporters Service. Various BSI electronic information services are also available which give details on all its products and services. Contact the Information Centre. Tel: +44 (0)20 8996 7111. Fax: +44 (0)20 8996 7048. Email: info@bsi-global.com.

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration. Tel: +44 (0)20 8996 7002. Fax: +44 (0)20 8996 7001. Email: membership@bsi-global.com.

Information regarding online access to British Standards via British Standards Online can be found at <http://www.bsi-global.com/bsonline>.

Further information about BSI is available on the BSI website at <http://www.bsi-global.com>.

Copyright

Copyright subsists in all BSI publications. BSI also holds the copyright, in the UK, of the publications of the international standardization bodies. Except as permitted under the Copyright, Designs and Patents Act 1988 no extract may be reproduced, stored in a retrieval system or transmitted in any form or by any means – electronic, photocopying, recording or otherwise – without prior written permission from BSI.

This does not preclude the free use, in the course of implementing the standard, of necessary details such as symbols, and size, type or grade designations. If these details are to be used for any other purpose than implementation then the prior written permission of BSI must be obtained.

Details and advice can be obtained from the Copyright & Licensing Manager. Tel: +44 (0)20 8996 7070. Fax: +44 (0)20 8996 7553. Email: copyright@bsi-global.com.