BSI

BS 302 : Part 8 : 1989

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British Standard

Stranded steel wire ropes

Part 8. Specification for higher breaking load ropes

Câbles toronnés en acier
Partie 8. Câbles à charge de rupture élevée — Spécifications

Litzenseile aus Stahldrähten
Teil 8. Seile mit großerer Bruchlast

British Standards Institution

Foreword

This Part of BS 302 has been prepared under the direction of the Mechanical Handling Standards Policy Committee. Part 8 and Part 7 are new Parts of the BS 302 series, which is itself a combined revision of BS 302 : 1968, BS 236 : 1968, BS 329 : 1968, BS 330 : 1968, BS 365 : 1968 and BS 3530 : 1968, which were withdrawn in 1987. BS 302 is now published in eight Parts and takes account of both national and international developments in steel wire ropes since 1968.

This Part specifies requirements for higher breaking load steel wire ropes that are additional to the general requirements in Part 1. Other Parts specify the additional requirements for other particular uses of ropes:

Part 2 Specification for ropes for general purposes
Part 3 Specification for zinc coated ropes for ships
Part 4 Specification for ropes for lifts
Part 5 Specification for ropes for hauling purposes
Part 6 Specification for ropes for mine hoisting
Part 7 Specification for large diameter ropes for general purposes

In line with the principles of international standard ISO 2408, published by the International Organization for Standardization (ISO), the rope constructions are grouped according to the number of outer wires in the strands. The general requirements of BS 302 : Part 1 and the methods used for calculating breaking loads and approximate masses are in accordance with ISO 2408. In respect of individual usages the ropes in Parts 2 and 3 are in accordance with ISO 2408 and those in section two of Part 4 in accordance with ISO 4344. In each of these Parts, however, certain additional ropes still in common use in the UK have been included. Part 7 is technically equivalent to ISO 8369. An ISO standard on higher breaking load rope is in preparation.

In line with current international practice, the term 'zinc coated' has been adopted in this standard in place of 'galvanized'. The terms are synonymous.

Purchasers ordering products to comply with BS 302 are advised to specify in their purchasing contract that the manufacturer operates a quality system complying with the appropriate Part of BS 5750, or suitable equivalent, to assure themselves that the products consistently achieve the required level of quality.

Wire rope users will find valuable information in the companion publication BS 6570.

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

Contents

Specification

1 Scope

This Part of BS 302 specifies the requirements for steel wire ropes for special purposes of higher breaking load than given in BS 302 : Part 2 and is for use in conjunction with BS 302 : Part 1.

NOTE 1. Information to be supplied by the purchaser on the enquiry and order is given in appendix F of BS 302 : Part 1 : 1987.

NOTE 2. The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of this Part of BS 302 the definitions given in BS 302 : Part 1 apply.

3 Compliance

Ropes in accordance with BS 302 : Part 8 shall comply with this Part and with BS 302 : Part 1.

4 Wire rope constructions and sizes

Constructions and size ranges of steel wire ropes shall be as given in table 1.

NOTE. In the absence of a precise indication by the purchaser on the enquiry and order, the choice of construction within a rope group is at the discretion of the manufacturer.

Table 1. Wire rope constructions and sizes

Rope group	Description	Size range (diameter)
		mm
6 x 19	8 to 12 outer wires in a strand, two or three layers over a king wire. Wires equal laid	9 to 52
6 x 36	14 to 18 outer wires in a strand, three or more layers of wire over a king wire. Wires equal laid	9 to 60
17 x 7 or 18 x 7	17 or 18 strands in rope. Two layers of strand over a steel core	9 to 26

5 Material

5.1 Wire

5.1.1 *General.* The wire used for the manufacture of wire ropes, as given in table 1, shall comply with sections one and two of BS 2763 : 1982. The mechanical tests shall be confined to the tensile strength and torsion requirements.

NOTE. The nominal tensile strength of the wire is at the discretion of the rope manufacturer.

5.1.2 *Wire finish.* The wire shall be bright or class Z zinc coated for all constructions. Zinc coating shall comply with BS 2763.

5.2 Rope main core

The rope main core shall be of steel. For six-stranded ropes it shall be an independent wire rope (IWRC) and for low rotation ropes it shall be a wire strand core (WSC).

6 Lay

Six-stranded ropes shall be of right-hand ordinary lay. Multi-strand ropes shall have either an ordinary or a Lang's lay outer layer.

7 Lubrication

The rope shall be lubricated in stranding with a lubricant complying with **3.3** of BS 302 : Part 1 : 1987.

8 Minimum breaking load

The minimum breaking loads of round strand and rotation resistant ropes shall be as given in tables 2 and 3.

NOTE 1. The values are calculated as given in **C.1** of BS 302 : Part 1 : 1987 except that the tensile grade of the wire, R_0 in newtons per millimetre squared, is based on notional figures as given in table 4.

NOTE 2. For guidance, tables 2 and 3 also give the approximate masses of ropes, calculated as described in **C.2** of BS 302 : Part 1 : 1987.

Table 2. Strength of round strand ropes

Nominal diameter (d)	Minimum breaking force	Minimum breaking load	Approximate mass
mm	kN	t	kg/100 m
9	59.4	6.06	32.2
10	73.3	7.47	39.8
11	88.7	9.04	48.2
12	106	10.8	57.3
13	124	12.6	67.3
14	144	14.7	78.0
16	188	19.2	102
18	238	24.3	129
19	265	27.0	144
20	293	29.9	159
22	355	36.2	193
24	402	41.0	229
26	472	48.1	269
28	547	55.8	312
32	715	72.9	408
36	904	92.2	516
40	1120	114	637
44	1310	134	771
48	1560	159	917
52	1830	187	1076
56	2120	216	1248
60	2440	249	1433

Table 3. Strength of rotation resistant ropes

Nominal diameter (d)	Minimum breaking force	Minimum breaking load	Approximate mass
mm	kN	t	kg/100 m
9	54.7	5.58	31.6
10	67.6	6.89	39.0
11	81.8	8.34	47.2
12	97.3	9.92	56.2
13	114	11.6	65.9
14	132	13.5	76.4
16	173	17.6	99.8
18	219	22.3	126
19	244	24.9	141
20	270	27.5	156
22	327	33.3	189
24	389	39.7	225
26	457	46.6	264

Table 4. Tensile grade of wire

Type of rope	Nominal diameter (d)		Tensile grade (R_0)
	From	Up to but not including	
	mm	mm	N/mm^2
Round strand	9	24	2060
	24	42	1960
	42	60	1900
Rotation resistant	9	26	2060

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Publications referred to

BS 302	Stranded steel wire ropes
	Part 1 Specification for general requirements
	Part 2 Specification for ropes for general purposes
	*Part 3 Specification for zinc coated ropes for ships
	*Part 4 Specification for ropes for lifts
	*Part 5 Specification for ropes for hauling purposes
	*Part 6 Specification for ropes for mine hoisting
	*Part 7 Specification for large diameter ropes for general purposes
BS 2763	Specification for round carbon steel wire for wire ropes
*BS 5750	Quality systems
*BS 6570	Code of practice for the selection, care and maintenance of steel wire ropes
*ISO 2408	Steel wire ropes for general purposes -- Characteristics
*ISO 4344	Steel wire ropes for lifts
*ISO 8369	Large diameter steel wire ropes

*Referred to in the foreword only.

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Mechanical Handling Standards Policy Committee (MHE/-) to Technical Committee MHE/2, upon which the following bodies were represented:

Associated Offices Technical Committee
Association of Supervisory and Executive Engineers
British Coal Corporation
British Ports Association and the National Association of Ports Employers
British Steel Industry (Wire Section)
Bureau Veritas
Chain Testers' Association of Great Britain
Department of the Environment (Property Services Agency)
Federation of Manufacturers of Construction Equipment and Cranes
Federation of Wire Rope Manufacturers of Great Britain
Health and Safety Executive
Institution of Mechanical Engineers
Institution of Mining and Metallurgy
Institution of Mining Engineers
Lloyds' Register of Shipping
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Zinc Development Association

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