
International Standard



3578

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Steel wire ropes — Standard designations

Câbles en acier — Désignations normalisées

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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 3578 was developed by Technical Committee ISO/TC 105, *Steel wire ropes*, and was circulated to the member bodies in June 1979.

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It has been approved by the member bodies of the following countries :

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Australia	http://www.iteh.ai/catalog/standards/sist/865b0c73-9001-4e36-a667-2e641050	Poland
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Czechoslovakia	Italy	Switzerland
Egypt, Arab Rep. of	Korea, Rep. of	United Kingdom
Finland	Netherlands	USSR
France	Norway	
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No member body expressed disapproval of the document.

Steel wire ropes — Standard designations

1 Scope and field of application

This International Standard specifies the rules for standard designations of steel wire ropes by means of letters and numerals indicating the construction and basic characteristics of the ropes.

2 Designation of ropes

The complete designation of a steel wire rope shall indicate the characteristics listed below in the order in which they are given :

- a) size (see 3.1);
- b) surface finish or wire (see 3.2);
- c) type of construction (see 3.3 and 3.4);
- d) tensile grade of the wire (see 3.5);
- e) direction of lay (see 3.6);
- f) minimum breaking load (see 3.7);
- g) linear mass (See 3.8).

An abbreviated designation may be used provided that the characteristics are given in the same order as described above.

Characteristics may be designated by either capital or small letters but a mixture of the two shall not be used.

3 Designation of characteristics

The designation of the individual characteristics included in the complete designation shall be as follows :

3.1 Size

3.1.1 Round ropes

The nominal diameter of the rope, expressed in millimetres.

3.1.2 Braided ropes

The diameter of a circle which circumscribes the rope, expressed in millimetres.

3.1.3 Flat ropes

The dimensions of a rectangle which encloses the rope, including stitching, expressed in millimetres.

3.2 Surface finish of the wires

The surface finish of the wires is designated by one of the following symbols :

3.2.1 NAT = plain wire (unprotected).

3.2.2 ZAA = grade A galvanized. (See ISO 2232.)

3.2.3 ZAB = grade AB galvanized. (See ISO 2232.)

3.2.4 ZBB = grade B galvanized. (See ISO 2232.)

3.3 Constructional symbols

3.3.1 Core

The core is represented by one of the following symbols :

3.3.1.1 Fibre core
(natural or synthetic) = FC

3.3.1.2 Natural fibre
core = NF

3.3.1.3 Synthetic fibre
core = SF

3.3.1.4 Metallic wire
rope core = IWR

3.3.1.5 Metallic wire
strand core = IWS

Followed by a full indication of the type of construction in brackets.

3.3.2 Wires

The cross-section of component wires of the rope is represented by the following symbols :

- 3.3.2.1 Round wire = no symbol
- 3.3.2.2 Triangular wire = V
- 3.3.2.3 Rectangular or flat wire = R
- 3.3.2.4 Trapezoidal wire = T
- 3.3.2.5 Oval wire = Q
- 3.3.2.6 A half-lock (or rail) wire and a round wire paired together = H
- 3.3.2.7 Z-shaped wire = Z

3.3.3 Strands

The cross-section of the strand is represented by one of the following symbols :

- 3.3.3.1 Round strand = no symbol
- 3.3.3.2 Triangular strand = V
- 3.3.3.3 Ribbon strand = R
- 3.3.3.4 Oval strand = Q

3.3.4 Rope

The cross-section of the rope is represented by one of the following symbols :

- 3.3.4.1 Round rope = no symbol
- 3.3.4.2 Braided rope = Y
- 3.3.4.3 Flat rope = P

3.4 Rope construction

3.4.1 Spiral strands and locked coil ropes

These are designated from the outside towards the centre of the strand or locked coil rope, indicating the number of wires in each successive layer of the strand or locked coil rope.

The number of wires in each separate layer, including the king wire, is separated by the sign "+" (see example 1).

Typical examples of designations for different types of construction are given in 5.3.

In the case of wire or wires having a section other than round, the appropriate symbol, as shown in 3.3.2, is added to the number of wires (see example 2).

3.4.2 Stranded ropes

These are designated from the outside towards the centre of the rope indicating successively the total number of strands and, in brackets, the designation of the construction of the strands. The construction of each strand is designated from the outside towards the centre of the strand, indicating the number of wires in each successive layer of the strand.

The number of wires in each separate layer of the strand, including the king wire or the fibre core, is separated by the sign "+".

The number of strands in each separate layer of the rope is separated by the sign "+".

In the case of a rope with a fibre core, the sign "+" is also used to separate that part of the designation relating to strands from that relating to the fibre core (see example 3).

In the case of a rope having a metallic core constituted by a strand, the sign "+" is followed by the symbol "IWS" (see 3.3.1), and this is followed by the designation of the core construction, in round brackets (see example 4).

In the case of a rope having a metallic core constituted by a stranded rope, the symbol "IWR" follows the sign "+" and is then followed by the designation of the construction of the stranded rope which constitutes the core (see example 8).

In the case of a Filler rope, the filler wires are marked by the letter "F" and separated from the wires of the corresponding layer by the sign "+" (see examples 9 and 10).

In the case of a Warrington rope, wires of different diameters belonging to the same layer are separated by the sign "/" (see examples 11 and 12).

In the case of a rope comprising several layers of strands, the number of strands in each layer is indicated and this is followed in brackets by the construction of the strand as in 3.4.1. The sign "+" is used to separate the layers (see example 13).

In the case of strands of other than round section a letter is added after the number of strands in each layer to indicate the shape of the section. The letters indicating the various shapes are listed in 3.3.3 (see examples 14 and 15).

For an abbreviated designation the total number of strands is given followed by the sign "X" and then the total number of wires in each strand. This is followed by the sign "+" and then a symbol (see 3.3.1) indicating the type of core. In the case of equal laid ropes, for example "Seale", "Filler" or "Warrington" ropes or a combination thereof and also in the case of compound constructions, i.e. equal laid ropes covered by a layer in cross lay, a full indication of the type of construction is given after the total number of wires in each strand.

3.4.3 Cable laid ropes

These are designated from the outside inwards, indicating the total number of individual stranded ropes, followed, in brackets, by the composition of each stranded rope (see example 16).

For the designation of the ropes constituting the cable, refer to 3.4.2.

3.4.4 Braided ropes

These are designated as in the case of stranded ropes (3.4.2) adding, before the total number of strands, the symbol "Y" (see example 17).

3.4.5 Flat ropes

These are designated as in the case of cable laid ropes (3.4.3), adding, before the total number of individual stranded ropes, the symbol "P" (see example 18).

3.5 Tensile grade of wires

The tensile grade of the wires is designated by the nominal value of tensile strength of the wires in newtons per square millimetre.

3.6 Direction of lay

The direction of lay is designated by two letters (Z or S according to the direction); the first letter stands for the closing operation and the second for the stranding operation.

The letter "Z" indicates the right-hand direction, and the letter "S" indicates the left-hand direction.

Thus "ZZ" or "SS" indicates Lang's lay; "ZS" or "SZ" indicates ordinary lay.

3.7 Minimum breaking load of rope

The minimum breaking load is designated either by giving its nominal value in kilonewtons or by giving the number of the relevant International Standard.

3.8 Linear mass

The linear mass is designated either by giving its nominal value in kilograms per 100 metres or by giving the number of the relevant International Standard.

4 General alphabetical list of symbols

F = Filler wire (see 3.4.2)

FC	=	Fibre core (natural or synthetic) (see 3.3.1.1)
H	=	A half-lock (or rail) wire and a round wire paired together (see 3.3.2.6)
NAT	=	Plain wire (see 3.2.1)
NF	=	Natural fibre core (see 3.3.1.2)
P	=	Flat rope (see 3.3.4.3)
Q	=	Oval wire or strand (see 3.3.2.5 and 3.3.3.4)
R	=	Rectangular wire — Ribbon strand (see 3.3.2.3 and 3.3.3.3)
S	=	Left-hand direction of lay (see 3.6)
SF	=	Synthetic fibre core (see 3.3.1.3)
T	=	Trapezoidal wire (see 3.3.2.4)
V	=	Triangular wire or strand (see 3.3.2.2 and 3.3.3.2)
IWR	=	Metallic wire rope core (see 3.3.1.4)
IWS	=	Metallic wire strand core (see 3.3.1.5)
Y	=	Braided rope (see 3.3.4.2)
Z	}	Z-shaped wire (see 3.3.2.7)
S		Right-hand direction of lay (see 3.6)
ZAA	=	Grade "A" galvanized wire (see 3.2.2)
ZAB	=	Grade "AB" galvanized wire (see 3.2.3)
ZBB	=	Grade "B" galvanized wire (see 3.2.4)

5 Examples of designation of steel wire ropes

5.1 Examples of complete designation

18 NAT 6(9+9+1)+NF 1770 ZZ 190 121

18 NAT 6(9+9+1)+NF 1770 ZZ ISO 2408

5.2 Examples of abbreviated designation

18 NAT 6×19 Seale+NF 1770 ZZ 190

18 NAT 6×19 Seale+NF 1770 ZZ

18 NAT 6×19 Seale+NF 1770

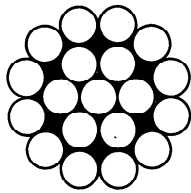
18 NAT 6×19 Seale+NF

5.3 Examples of designation for different types of construction

Type of construction

Designation

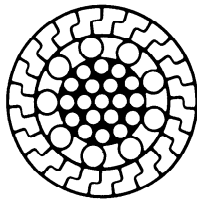
1



Spiral strand
 (Complete) : 12 + 6 + 1
 (Abbrev.) : 1 × 19

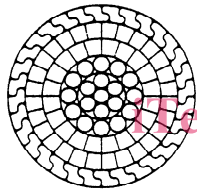
2

a)



Locked coil rope
 (Complete) : 23Z + 9H + 12 + 6 + 1

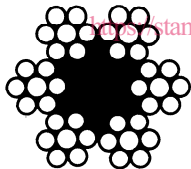
b)



Locked coil rope
 (Complete) : 32Z + 28T + 20T + 12 + 6 + 1

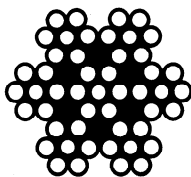
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3



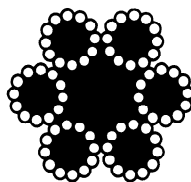
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 Stranded rope with natural fibre core
 (Complete) : 6(6 + 1) + NF
 (Abbrev.) : 6 × 7 + NF

4



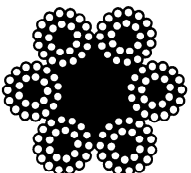
Stranded rope with metallic core (IWS)
 (Complete) : 6(6 + 1) + IWS(6 + 1)
 (Abbrev.) : 6 × 7 + IWS

5



Stranded rope with seven fibre cores (six synthetic and one natural fibre)
 (Complete) : 6(12 + SF) + NF
 (Abbrev.) : 6 × 12 + 7FC

6

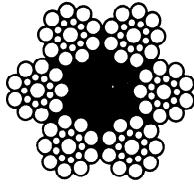


Stranded rope with seven synthetic fibre cores
 (Complete) : 6(15 + 9 + SF) + SF
 (Abbrev.) : 6 × 24 + 7SF

Type of construction

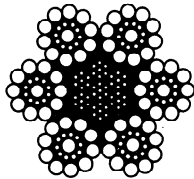
Designation

7



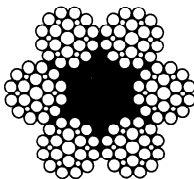
Seale rope with natural fibre core
 (Complete) : $6(9 + 9 + 1) + \text{NF}$
 (Abbrev.) : $6 \times 19 \text{ Seale} + \text{NF}$

8



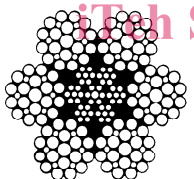
Seale rope with metallic core (IWR)
 (Complete) : $6(10 + 10 + 1) + \text{IWR}[6(6 + 1) + \text{IWS}(6 + 1)]$
 (Abbrev.) : $6 \times 21 \text{ Seale} + \text{IWR}$

9



Filler rope with natural fibre core
 (Complete) : $6(12 + 6\text{F} + 6 + 1) + \text{NF}$
 (Abbrev.) : $6 \times 19 \text{ Filler} + \text{NF}$

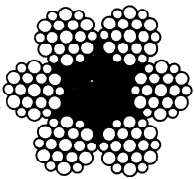
10



Filler rope with metallic core (IWR)
 (Complete) : $6(12 + 6\text{F} + 6 + 1) + \text{IWR}[6(6 + 1) + \text{IWS}(6 + 1)]$
 (Abbrev.) : $6 \times 19 \text{ Filler} + \text{IWR}$

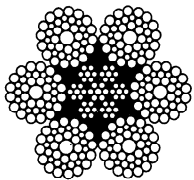
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11



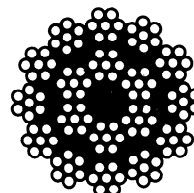
Warrington rope with natural fibre core
 (Complete) : $6(6/6 + 6 + 1) + \text{NF}$
 (Abbrev.) : $6 \times 19 \text{ Warrington} + \text{NF}$

12



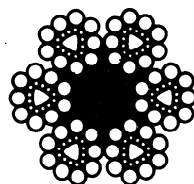
Warrington Seale rope with metallic core (IWR)
 (Complete) : $6(16 + 8/8 + 8 + 1) + \text{IWR}[6(6 + 1) + \text{IWS}(6 + 1)]$
 (Abbrev.) : $6 \times 41 \text{ Warrington-Seale} + \text{IWR}$

13



Multi-strand rope (with two layers of round strands) and a natural fibre core
 (Complete) : $12(6 + 1) + 6(6 + 1) + \text{NF}$
 (Abbrev.) : $18 \times 7 + \text{NF}$

14

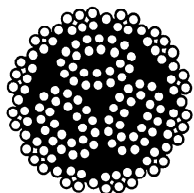


Triangular strand rope with natural fibre core
 (Complete) : $6\text{V}(9 + 12 + 1\text{V}) + \text{NF}$
 (Abbrev.) : $6\text{V} \times 22 + \text{NF}$

Type of construction

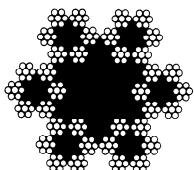
Designation

15



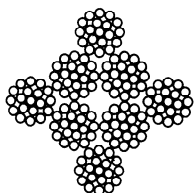
Rope having flat and oval strands with several natural fibre cores
 (Complete) : $12R(6) + 3Q(15 + 9 + NF) + NF$

16



Cable laid rope
 (Complete) : $6[6(6 + 1) + NF] + NF$
 (Abbrev.) : $6 \times 6 \times 7 + 7NF$

17



Braided rope
 (Complete) : $Y8(12 + 6F + 6 + 1)$
 (Abbrev.) : $Y8 \times 19$ Filler

18



Flat rope
 (Complete) : $P8[4(6 + 1) + NF]$
 (Abbrev.) : $P8 \times (4 \times 7 + NF)$

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