

Australian Standard[®]

Steel wire ropes—Product specification



This Australian Standard® was prepared by Committee ME-007, Steel Wire Ropes. It was approved on behalf of the Council of Standards Australia on 23 March 2009. This Standard was published on 19 March 2010.

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- Australasian Institute of Mining and Metallurgy
 - Australian Business Limited
 - Australian Chamber of Commerce and Industry
 - Crane Industry Council of Australia
 - Materials Australia
 - Shipping Australia
 - TestSafe Australia
-

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Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee and through the public comment period.

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Australian Standard[®]

Steel wire ropes—Product specification

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PREFACE

This Standard was prepared by the Standards Australia Committee ME-007, Steel Wire Ropes to supersede AS 3569—1989.

This Standard incorporates Amendment No. 1 (October 2012). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

The objective of this Standard is to provide a common specification, vocabulary, designation and classification system for steel wire ropes for reference by manufacturers, suppliers, users and regulators so that steel wire ropes may be selected and applied appropriately.

Australia has a standard for spiral ropes (AS 2841, *Galvanized steel wire strand*), which does not conflict with this Standard.

This Standard is based on the following ISO Standards:

ISO

2408:2004 Steel wire ropes for general purposes—Minimum requirements

17893:2004 Steel wire ropes—Vocabulary, designation and classification

Variations in this Standard from the above ISO Standards include the following:

- 1 The range of sizes has been extended beyond 60 mm.
- 2 Breaking strengths of 1570 Grade ropes have been developed for a limited range of sizes and classifications of wire ropes.
- 3 The Australian Standards for wire and coatings for wire are specified.
- 4 The information required on test certificates has been expanded.
- 5 The markings required are more substantial.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of a Standard, whereas an ‘informative’ appendix is only for information and guidance.

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STANDARDS AUSTRALIA

Australian Standard
Steel wire ropes—Product specification

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Australian Standard specifies minimum requirements for the manufacture and testing of stranded steel wire ropes for general purposes, including lifting equipment such as cranes and hoists. Ropes for slings are also dealt with, and tables giving minimum breaking forces for the more common sizes, grades and constructions of stranded rope presented. It is applicable to single-layer, rotation-resistant and parallel-closed ropes made from wires of uncoated (bright), zinc-coated and zinc-alloy coated finish. Additional requirements may apply for specific applications including, but not limited to the following:

- (a) Mining purposes.
- (b) Aircraft control.
- (c) The petroleum and natural gas industries.
- (d) Aerial ropeways and funiculars.
- (e) Lifts.

NOTES:

- 1 For rope grade equivalents see Appendix F.
- 2 Standards relevant for the application of steel wire ropes are listed in Appendix G.

1.2 NORMATIVE REFERENCES

The following are the normative documents referenced in this Standard:

NOTE: Documents referenced for informative purposes are listed in the Bibliography.

AS	
1394	Round steel wire for ropes
4534	Zinc and zinc/aluminium-alloy coatings on steel wire
ISO	
2408	Steel wire ropes for general purposes—Minimum requirements
3108	Steel wire ropes for general purposes—Determination of actual breaking load
4345	Steel wire ropes—Fibre main cores—Specification
4346	Steel wire ropes for general purposes—Lubricants—Basic requirements
6892	Metallic materials—Tensile testing
6892-1	Part 1: Method of test at room temperature

SECTION 2 ELEMENTS OF A ROPE

2.1 DESCRIPTION

2.1.1 General

Figure 1 shows the components of a stranded rope.

The system for describing steel wire ropes shall take into account the number of strands, the number of outer strands, the number of layers of strands in the rope and the number of wires, the number of outer wires, the number of layers of wires and strand lay type of the outer strand.

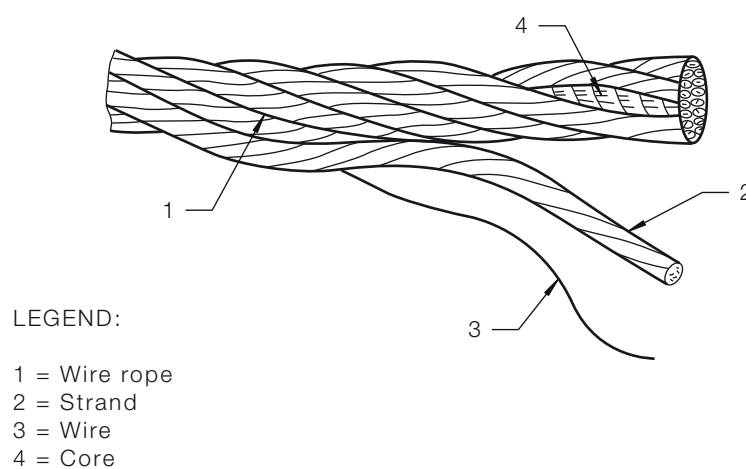


FIGURE 1 STRANDED ROPE

2.1.2 Direction and type of lay

The direction and type of rope lay shall be one of the following:

- (a) Right ordinary lay (sZ).
NOTE: Formerly referred to as right hand ordinary lay (designated RHOL) and right regular lay (designated RRL).
 - (b) Left ordinary lay (zS).
NOTE: Formerly referred to as left hand ordinary lay (designated LHOL) and left regular lay (designated LRL).
 - (c) Right Lang lay (zZ).
NOTE: Formerly referred to as right hand Langs lay (designated RHLL) or right Lang lay (designated RLL).
 - (d) Left Lang lay (sS).
NOTE: Formerly referred to as left hand Langs lay (designated LHLL) or left Lang lay (designated LLL).
 - (e) Right alternate lay (aZ).
NOTE: Formerly referred to as right hand alternate lay (designated RHAL).
 - (f) Left alternate lay (aS).
NOTE: Formerly referred to as left hand alternate lay (designated LHAL).
- NOTE: The direction and type of rope lay should be specified by the purchaser.

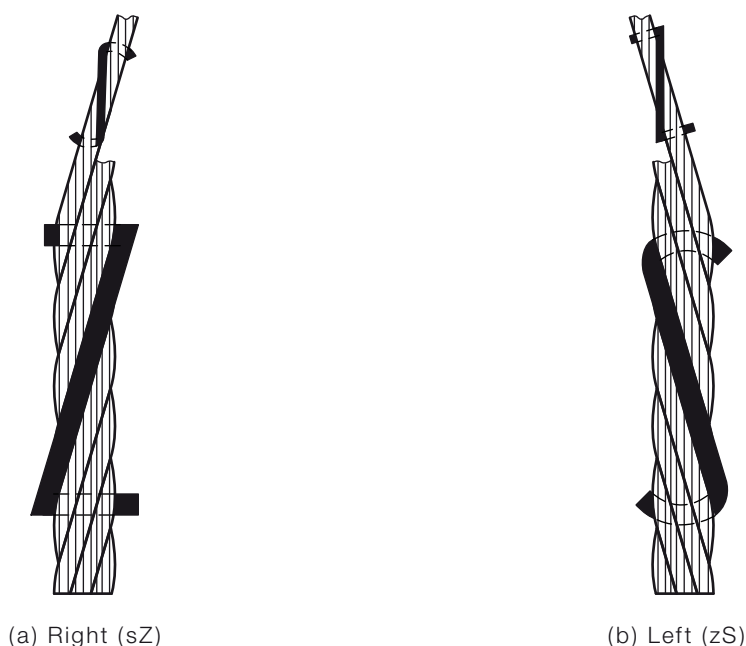
2.1.3 Lay direction of rope—Z, S

2.1.3.1 General

Direction, right (Z) or left (S), corresponding to the direction of lay of the outer wires in a spiral rope, the outer strands in a stranded rope or the unit ropes in a cable-laid rope in relation to the longitudinal axis of the rope.

2.1.3.2 Ordinary lay—sZ, zS

Stranded rope in which the direction of lay of the wires in the outer strands is in the opposite direction to the lay of the outer strands in the rope (see Figure 2.1.3.2).

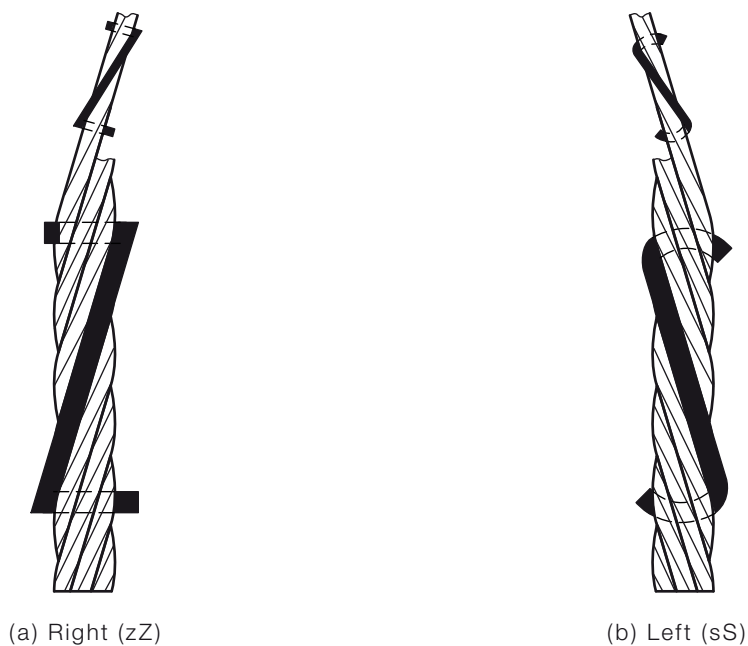


NOTE: The first letter of the symbol denotes strand direction, the second, rope direction.

FIGURE 2.1.3.2 ORDINARY LAY

2.1.3.3 Lang lay—zZ, sS

Stranded rope in which the direction of lay of the wires in the outer strands is in the same direction as the lay of the outer strands in the rope (see Figure 2.1.3.3).



NOTE: The first letter of the symbol denotes strand direction, the second, rope direction.

FIGURE 2.1.3.3 LANG LAY

2.1.3.4 Alternate lay—*aZ, aS*

Stranded rope in which the direction of lay of wires in the outer strands is alternately left and right such that half of the rope is ordinary lay while the other half is Lang lay and the lay direction of the rope will be either right (*aZ*) or left (*aS*).

2.1.3.5 Contra-lay

Rope in which at least one layer of wires in a spiral rope or one layer of strands in a stranded rope is laid in the opposite direction to the other layers.

NOTE: Contra-lay is only possible in spiral ropes having more than one layer of wires and in stranded ropes (e.g., rotation-resistant) having more than one layer of strands.

2.1.4 Lay direction of strand—*z, s*

Direction, right (*z*) or left (*s*), corresponding to the direction of lay of the outer wires in relation to the longitudinal axis of the strand (see Figure 2.1.4).



FIGURE 2.1.4 LAY DIRECTION OF STRANDS FOR STRANDED ROPES

2.2 DIMENSIONS

2.2.1 Diameter

2.2.1.1 General

The nominal diameter (d) shall be the dimension by which the rope is designated.

2.2.1.2 Dimension of round rope

Diameter that circumscribes the rope cross-section (see Figure 2.2.1.2).

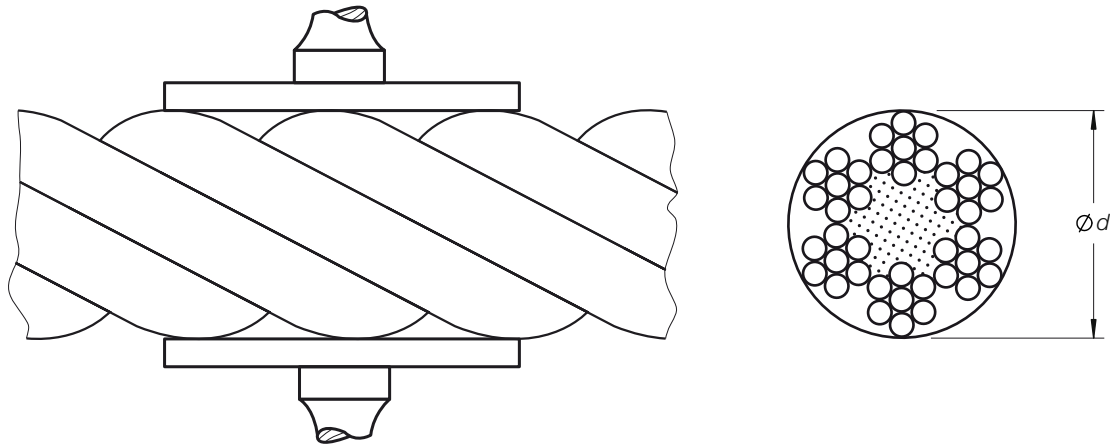


FIGURE 2.2.1.2 DIMENSION OF A ROUND ROPE

2.2.1.3 Dimension(s)

For round rope and braided rope, the nominal diameter shall be expressed in millimetres.

2.2.1.4 Diameter measurement

Diameter measurements shall be taken on a straight portion of rope, either under no tension or a tension not exceeding 5% of the minimum breaking force, at two positions spaced at least 1 m apart. At each position, two measurements, at 90° apart, of the circumscribed circle diameter shall be taken. The measuring equipment shall extend over at least two adjacent strands.

The average of these four measurements shall be the measured diameter.

2.2.1.5 Tolerance

When measured in accordance with Clause 7.3, the measured diameter shall be within the tolerances given in Table 2.2.1.5.

TABLE 2.2.1.5
TOLERANCES ON ROPE DIAMETER

Nominal rope diameter (<i>d</i>) mm	Tolerance as percentage of nominal diameter	
	Ropes with strands that are exclusively of wire or incorporate solid polymer centres	Ropes with strands that incorporate fibre centres*
$2 \leq d < 4$	+8 0	—
$4 \leq d < 6$	+7 0	+9 0
$6 \leq d < 8$	+6 0	+8 0
≥ 8	+5 0	+7 0

* For example, 6×24 FC

2.2.2 Difference between diameter measurements

The difference between any two of the four measurements taken in accordance with Clause 7.3 and expressed as a percentage of the nominal rope diameter shall not exceed the values given in Table 2.2.2.

TABLE 2.2.2
PERMISSIBLE DIFFERENCES BETWEEN ANY TWO DIAMETER MEASUREMENTS

Nominal rope diameter (<i>d</i>) mm	Tolerance as percentage of nominal diameter	
	Ropes with strands that are exclusively of wire or incorporate solid polymer centres	Ropes with strands that incorporate fibre centres*
$2 \leq d < 4$	7	—
$4 \leq d < 6$	6	8
$6 \leq d < 8$	5	7
≥ 8	4	6

* For example, 6×24 FC

2.2.3 Rope lay length (*H*)

Distance parallel to the longitudinal rope axis in which the outer wires of a spiral rope, the outer strands of a stranded rope or the unit ropes of a cable-laid rope make one complete turn (or helix) about the axis of the rope (see Figure 2.2.3).

NOTE: For description of cross-lay, see Clause 2.3.11.

For single-layer ropes of 6×7 class, the length of lay (*H*) of the finished rope shall not exceed $8 \times$ rope diameter (*d*).

For other single-layer ropes with round strands (except those with three or four strands), parallel-lay closed ropes and rotation-resistant ropes with round strands or shaped strands, the length of lay (*H*) of the finished rope shall not exceed $7.25 \times$ rope diameter (*d*).

For single-layer ropes with shaped strands, (e.g., triangular strand) the length of lay (*H*) of the finished rope shall not exceed $10 \times$ rope diameter (*d*).



FIGURE 2.2.3 LAY LENGTH—ROPE

2.2.4 Strand lay length (h)

Distance parallel to the longitudinal strand axis in which an outer wire makes one complete turn (or helix) about the axis of the strand (see Figure 2.2.4).

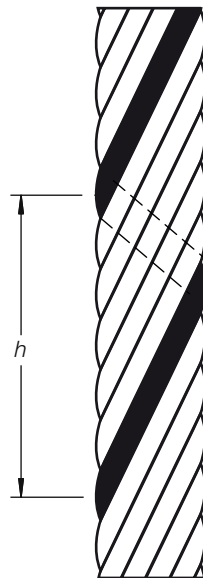


FIGURE 2.2.4 LAY LENGTH—STRAND

2.2.5 Rope length

2.2.5.1 Measured rope length (L_m)

Length which corresponds to the actual length supplied using a prescribed method.

NOTE: The measured length may also be specified at a pre-determined load.

2.2.5.2 Nominal rope length (*L*)

Length on which the order is usually based.

2.2.5.3 Rope length

The length of rope supplied under no load shall be equivalent to the specified length subject to the following tolerances:

- (a) ≤400 m +5, −0%.
- (b) >400 m and ≤1000 m +20, −0 m.
- (c) >1000 m +2, −0%.

2.3 STRANDS AND STRAND TYPES

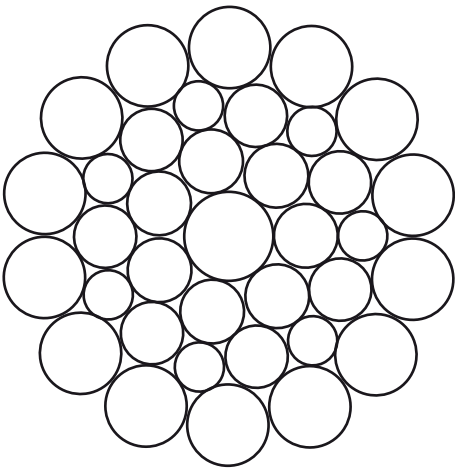
2.3.1 Strand

Element of rope normally consisting of an assembly of wires of appropriate shape and dimensions laid helically in the same direction in one or more layers around a centre.

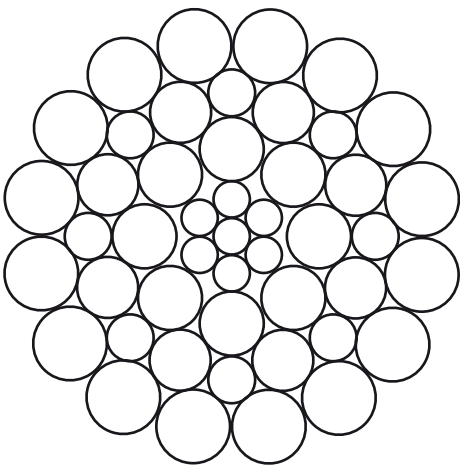
NOTE: Strands containing three or four wires in the first layer, or certain shaped strands (e.g., ribbon), might not have a centre.

2.3.2 Round strand

Strand with a perpendicular cross-section which is approximately the shape of a circle (see Figure 2.3.2).



(a) Strand with one centre wire



(b) Strand with (1-6) built-up centre

FIGURE 2.3.2 ROUND STRAND WITH DIFFERENT CENTRES

2.3.3 Triangular strand V

Strand with a perpendicular cross-section that is approximately the shape of a triangle (see Figure 2.3.3).

NOTE: Triangular strands can have built-up centres.

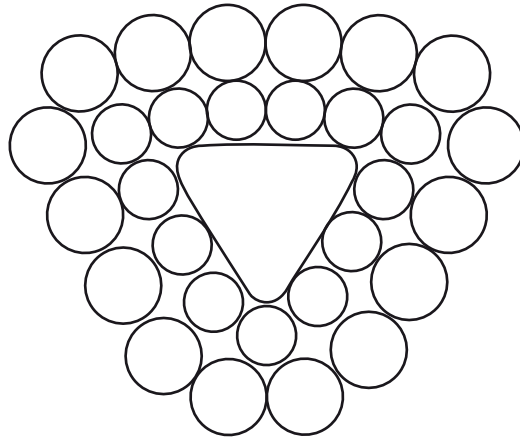


FIGURE 2.3.3 TRIANGULAR STRAND WITH TRIANGULAR (V) CENTRE WIRE

2.3.4 Single lay strand

Strand that contains only one layer of wires (see Figure 2.3.4).

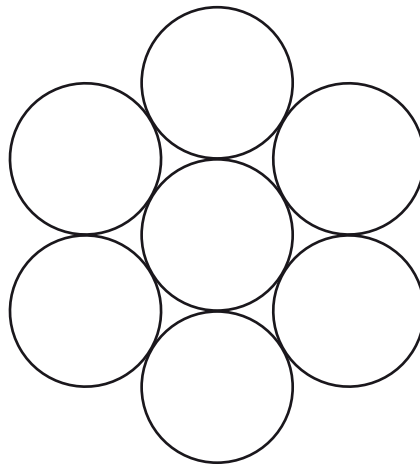


FIGURE 2.3.4 SINGLE LAY STRAND

2.3.5 Parallel lay strand—Equal lay

Strand that contains at least two layers of wires, all of which are laid in one operation (in the same direction).

NOTE: The lay lengths of all the wire layers are equal and the wires of any two superimposed layers are parallel, resulting in linear contact.

2.3.6 Seale

Parallel lay strand construction with the same number of wires in both layers (see Figure 2.3.6).

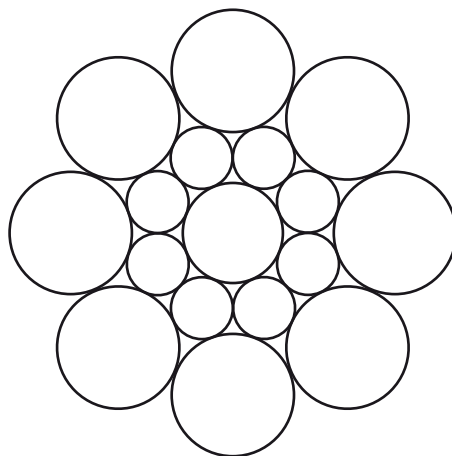


FIGURE 2.3.6 SEALE CONSTRUCTION

2.3.7 Warrington

Parallel lay strand construction having an outer layer containing alternately large and small wires and twice the number of wires as the inner layer (see Figure 2.3.7).

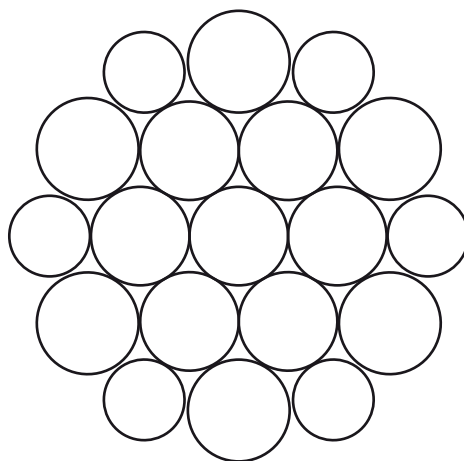


FIGURE 2.3.7 WARRINGTON CONSTRUCTION

2.3.8 Filler

Parallel lay strand construction having an outer layer containing twice the number of wires than the inner layer, with filler wires laid in the interstices between the layers (see Figure 2.3.8).

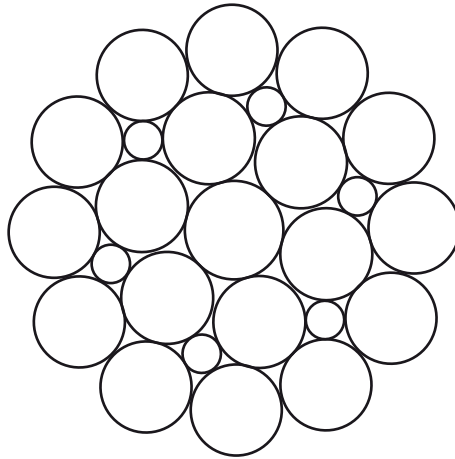


FIGURE 2.3.8 FILLER CONSTRUCTION

2.3.9 Combined parallel lay

Parallel lay strand construction having three or more layers laid in one operation and formed from a combination of strand types Warrington (see Clause 2.3.7) and Seale (see Clause 2.3.6 and Figure 2.3.9).

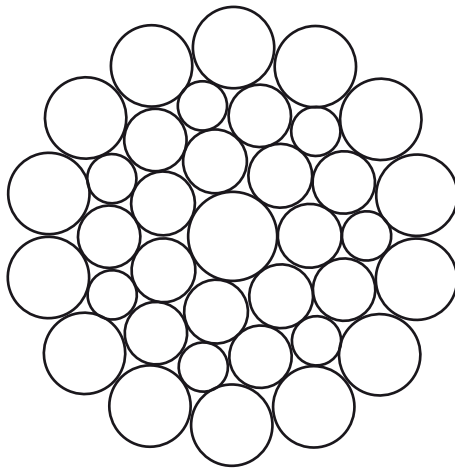


FIGURE 2.3.9 WARRINGTON–SEALE COMBINED PARALLEL LAY—EXAMPLE

2.3.10 Multiple operation lay strand

Construction containing at least two layers of wires in which successive layers are laid in more than one operation.

2.3.11 Cross-lay M

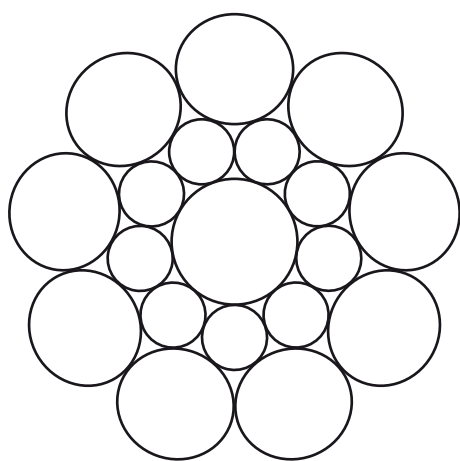
Strand that contains more than one layer of wires, all laid in the same direction, the wires of superimposed wire layers crossing one another and making point contact.

2.3.12 Compound lay N

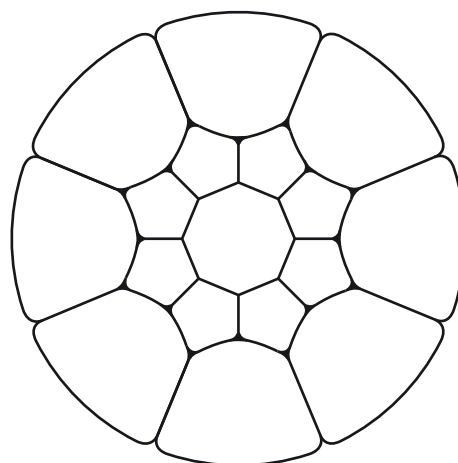
Strand that contains a minimum of three layers of wires where the outer layer is laid in a separate operation, but in the same direction as the others, over a parallel lay construction forming the inner layers.

2.3.13 Compacted strand K

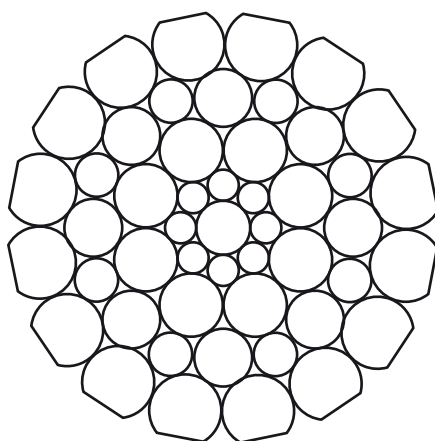
Strand that has been subjected to a compacting process such as drawing, rolling or swaging whereby the metallic cross-sectional area of the wires remains unaltered whereas the shape of the wires and the dimensions of the strand are modified (see Figure 2.3.13).



(a) Strand before compacting



(b) Strand after compacting



(c) Partial compacting

FIGURE 2.3.13 COMPACTED STRAND K SHOWING EFFECTS OF COMPACTING—EXAMPLES

2.3.14 Types of strand constructions

The symbols for the more common types of round strand constructions shall be in accordance with Table 2.3.14.

TABLE 2.3.14
SYMBOLS FOR THE MORE COMMON TYPES OF ROUND STRAND
CONSTRUCTIONS

Construction type	Symbol	Strand designation	Examples of strand construction
Single lay	No symbol	6 7	(1-5) (1-6)
Parallel lay			
Seale	S	17S 19S	(1-8-8) (1-9-9)
Warrington	W	19W	(1-6-6+6)
Filler	F	21F 25F 29F 41F	(1-5-5F-10) (1-6-6F-12) (1-7-7F-14) (1-8-8-8F-16)
Combined parallel lay	WS† (example)	26WS 31WS 36WS 41WS 41WS 46WS 49WS	(1-5-5+5-10) (1-6-6+6-12) (1-7-7+7-14) (1-8-8+8-16) (1-6/8-8+8-16) (1-9-9+9-18) (1-8+8-16-16)
Multiple operation lay (round strand) Cross lay	M	19M 24M 37M	(1-6/12) (FC-9-15) (1-6/12/18)
Compound lay*	N	35WN	(1-6-6+6/16)
Triangular strand	V	V9 V10 V25 V25B V28B	(V-8) (V-9) (V-12/12) (V-12-12) (built up centre) (V-12/15) (built up centre)

* N is additional and precedes the basic type symbol, e.g., compound Seale is SN and compound Warrington is WN

† This is one example. This could also be 'SF'

NOTES:

1 Connecting symbols:

- / = cross lay
- + = Warrington
- = Seale, single layer or other equal lay strands.

2 Where the strand designation (using letters) might not be significant enough to accurately reflect the strand construction, the detailed strand construction (using numbers) may be used, starting with the centre wire or strand centre.

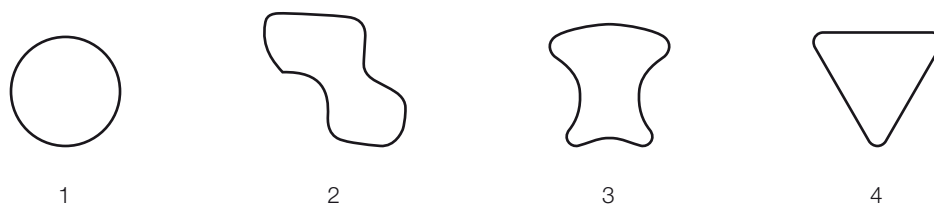
2.4 WIRE

2.4.1 General

Before ropemaking, wires shall conform to the diameter, tensile, other physical properties and, where applicable, coating requirements specified in AS 1394.

NOTE: Examples of wire shapes are shown in Figure 2.4.1.

All wires of the same nominal diameter in the same wire layer shall be of the same tensile strength grade.



LEGEND:

- 1 = Round
- 2 = Full-locked (Z)
- 3 = Half-locked (H)
- 4 = Triangular (V)

FIGURE 2.4.1 WIRE SHAPES—EXAMPLES

2.4.2 Grade

The tensile grade of wires shall be sufficient to enable the minimum breaking force of the rope to be achieved.

The rope grades for the more common classes of ropes shall be as given in Table 2.4.2 [see Clause 4.3.5 (rope grade R_r)]. Breaking forces for wire rope shall be as given in Tables C1 to C17, Appendix C. Breaking forces for alternative grades shall be supplied by the manufacturer.

Intermediate rope grades may be supplied by agreement between purchaser and the manufacturer provided all of the other requirements are met.

NOTE: Not all ropes will necessarily have a rope grade.

TABLE 2.4.2
TENSILE STRENGTH GRADES OF WIRES
(EXCLUDING CENTRE AND FILLER WIRES)
FOR GIVEN ROPE GRADES

Rope grade	Range of wire tensile strength grades (N/mm ² , MPa)
1570	1370 to 1770
1770	1570 to 1960
1960	1770 to 2160
2160	1960 to 2160

2.4.3 Outer wires

2.4.3.1 Outer wire—*Spiral rope*

Spiral rope wire positioned in the outer layer of a rope.

NOTE: Spiral is also known as strand.

2.4.3.2 Outer wire—*Stranded rope*

Stranded rope wire positioned in the outer layer of wires in the outer strands of a rope.

2.4.4 Inner wires

2.4.4.1 Inner wire—*Spiral rope*

Wire of the intermediate layers of a rope positioned between the centre wires and outer layer.

2.4.4.2 Inner wire—*Stranded rope*

Any wire of a rope other than its centre wires, filler wires, core wires or outer wires.

2.4.5 Filler wire

Comparatively small wire used in filler constructions to fill up the interstices between layers of wires (see Figure 2.3.8).

2.4.6 Centre wires (king wires)

2.4.6.1 Centre wire—*Spiral rope*

Wire positioned at the centre of a rope.

2.4.6.2 Centre wire—*Stranded rope*

Wire positioned at the centre of the strands of a rope.

2.4.7 Core wire

Wire of the core of a stranded rope.

2.4.8 Loadbearing wire

Wire in a rope regarded as contributing towards the breaking force of the rope.

2.4.9 Layer (of wires)

Assembly of wires having one pitch circle diameter, the first layer being that laid immediately over the strand centre.

NOTES:

- 1 The exception is the Warrington layer, comprising large and small wires, where the smaller wires are positioned on a pitch circle diameter which is larger than that of the larger wires.
- 2 Filler wires do not constitute a separate layer.

2.4.10 Finish and quality of coating

Condition of the surface finish of the wire (e.g., bright (uncoated), zinc-coated, zinc-alloy-coated or other protective coating) and the class of coating are defined by the minimum mass of coating and the adherence of a coating to the steel below.

2.4.11 Mass of coating

Mass of coating (obtained by a prescribed method) per unit of surface area of the uncoated wire.

NOTE: Mass of coating is expressed in grams per square metre.

Table 2.4.11 lists round wire coating masses and comparable classifications in accordance with AS/NZS 4534 and ISO 2408.

TABLE 2.4.11
ZINC COATING CLASSIFICATIONS

Nominal diameter of coated wire (<i>d</i>) mm	Minimum coating mass, g/m ²	
	Zinc or zinc/aluminium-alloy coating to AS/NZS 4534	
	Class W05 (Comparable to Quality B in ISO 2408)	Class W10 (Comparable to Quality A in ISO 2408)
> 0.19 ≤ 0.23	15	25
> 0.23 ≤ 0.33	25	45
> 0.33 ≤ 0.40	35	60
> 0.40 ≤ 0.46	40	75
> 0.46 ≤ 0.53	50	90
> 0.53 ≤ 0.63	60	105
> 0.63 ≤ 0.75	65	120
> 0.75 ≤ 0.85	70	130
> 0.85 ≤ 0.95	80	140
> 0.95 ≤ 1.06	85	150
> 1.06 ≤ 1.18	90	160
> 1.18 ≤ 1.32	95	170
> 1.32 ≤ 1.55	100	185
> 1.55 ≤ 1.80	110	200
> 1.80 ≤ 2.24	120	215
> 2.24 ≤ 2.72	125	230
> 2.72 ≤ 3.15	130	240
> 3.15 ≤ 3.55	135	250
> 3.55 ≤ 4.25	140	260
> 4.25 ≤ 5.00	150	275
> 5.00 ≤ 8.00	160	290
> 8.00	170	305

NOTE: Refer to AS 1394 for the dimensional and mechanical properties of round wires (before ropemaking).

2.4.12 Wire finish

The finish of the wires shall be uncoated (bright), zinc-coated Class W05 or zinc-coated Class W10, in accordance with Table 2.4.11.

For ropes of bright wire finish, substitution of bright wires by zinc-coated wires shall be limited to inner wires, centre wires, filler wires and core wires.

For ropes of zinc-coated wire finish, all of the wires shall be zinc coated, including those of any steel core.

Where zinc-coated is specified this may also include zinc alloy Zn95/Al5.

2.5 CORES AND CORE TYPES

2.5.1 Definitions

2.5.1.1 Core

Central elements of a round rope around which are laid helically the strands of a stranded rope or the unit ropes of a cable laid rope.

2.5.1.2 Fibre core (FC)

Core made from either natural fibres (NFC) or synthetic fibres (SFC).

NOTE: Fibre cores are normally produced in the sequence fibres to yarns, yarns to strands and strands to rope.

2.5.1.3 *Steel core (WC)*

Core made from steel wires arranged as a wire strand (WSC) or as an independent wire rope (IWRC).

NOTES:

- 1 The steel core and/or its outer strands can also be covered with either fibre or solid polymer.
- 2 The stranded rope core is normally made as a separate unit, the exception being where the core is closed in parallel with the outer strands, designated PWRC.

2.5.1.4 *Solid polymer core (SPC)*

Core consisting of a solid polymer material having a round shape or a round shape with grooves, and which can also contain an internal element of wire(s) or fibre.

2.5.2 Minimum requirements

Cores of single-layer stranded ropes shall normally be of steel or fibre, although other types such as composites (e.g., steel plus fibre or steel plus polymer) or solid polymer may also be supplied.

The purchaser should specify any particular core type requirements.

Fibre cores for single-layer stranded ropes shall conform to ISO 4345 and for rope diameters 8 mm and above shall be doubly closed (that is, from yarn into strand and from strand into rope).

Natural fibre cores shall be treated with an impregnating compound to inhibit rotting and decay.

Steel cores shall be either an independent wire rope (IWRC) or a wire strand (WSC).

Steel cores of single-layer stranded ropes larger than 12 mm diameter shall be an independent wire rope (IWRC), unless specified otherwise.

2.5.3 Designations, cores, centres of parallel-closed ropes and central elements of rotation-resistant rope

The symbols for cores of single layer ropes, the centres of parallel-closed ropes and the central elements of rotation-resistant ropes shall be in accordance with Table 2.5.3.

TABLE 2.5.3
SYMBOLS FOR CORES, CENTRES OF PARALLEL-CLOSED
ROPES AND CENTRES OF ROTATION-RESISTANT ROPES

Item or element	Symbol
Single layer rope	
Fibre core	FC
Natural fibre core	NFC
Synthetic fibre core	SFC
Solid polymer core	SPC
Steel core	WC
Wire strand core	WSC
Independent wire rope core	IWRC
Independent wire rope core with compact strands	IWRC(K)
Independent wire rope core covered with a polymer	EPIWRC
Parallel-closed rope	
Parallel wire rope centre	PWRC
Parallel wire rope centre with compacted strands	PWRC(K)
Parallel wire rope centre filled with a polymer	PWRC(EP)
Rotation-resistant rope	
Central element	
Fibre content	FC
Wire strand centre	WSC
Compacted wire strand centre	KWSC

2.6 LUBRICANTS AND PRESERVATION AGENTS

2.6.1 Lubricant

Lubricants shall be in accordance with ISO 4346.

2.6.2 Rope lubricant

Material applied during the manufacture of a strand, core or rope for the purpose of reducing internal friction and/or assisting in providing protection against corrosion.

2.6.3 Impregnating agent

Material used in the manufacture of natural fibre cores, coverings or inserts for the purpose of assisting in inhibiting rotting and decay.

2.6.4 Preservation agent

Material, usually some form of blocking compound, applied during and/or after manufacture of the rope and/or to fibre inserts and coverings for the purpose of assisting in providing protection against corrosion.

2.7 INSERT—I

Fibre or solid polymers so positioned as to separate adjacent strands or wires in the same or overlying layers, or fill the interstices of the rope.

SECTION 3 ROPES AND ROPE TYPES

3.1 STRANDED ROPE

Stranded rope is an assembly of several strands laid helically in one (single-layer rope) or more (rotation-resistant or parallel-closed rope) layers around a core or centre.

NOTE: Stranded ropes consisting of three or four outer strands might, or might not, have a core.

3.2 SINGLE-LAYER ROPE

Single-layer rope is stranded rope consisting of one layer of strands laid helically around a core (see Figure 3.2).

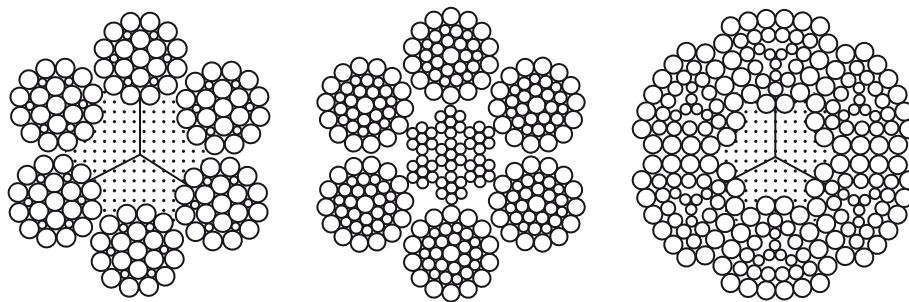


FIGURE 3.2 SINGLE-LAYER STRANDED ROPES—EXAMPLES

3.3 ROTATION-RESISTANT ROPE

Stranded rope designed to generate reduced levels of torque and rotation when loaded (see Figure 3.3).

Rotation-resistant rope has previously been known as non-rotating or multi-strand rope.

NOTES:

- 1 Rotation-resistant ropes generally comprise an assembly of at least two layers of strands laid helically around a centre, the direction of lay of the outer strands being opposite to that of the underlying layer.
- 2 Ropes having three or four strands can also be designed to exhibit rotational-resistant properties.

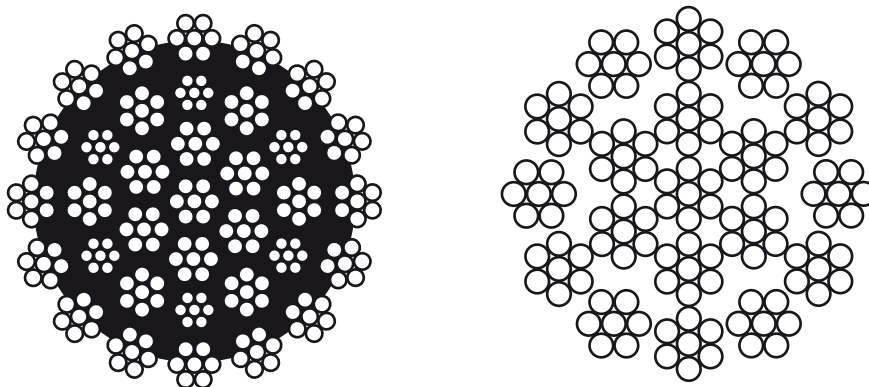


FIGURE 3.3 ROTATION-RESISTANT ROPES—EXAMPLES