Australian Standard®

Steel wire ropes

This Australian Standard was prepared by Committee ME/7, Steel Wire Ropes. It was approved on behalf of the Council of Standards Australia on 16 June 1988 and published on 20 October 1989.

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Australasian Institute of Mining and Metallurgy
Australian Chamber of Commerce
Australian Chamber of Shipping
Australian Federation of Construction Contractors
Australian Mining Industry Council
Confederation of Australian Industry
Department of Defence
Department of Industrial Relations & Employment, N.S.W.
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For previous history see Preface.
AS 1426—1973 and AS 1656—1974 revised, amalgamated and redesignated AS 3569—1989.

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PREFACE

This Standard was prepared by the Standards Australia Committee on Steel Wire Ropes to supersede AS 1426—1973, *Steel wire ropes for winding and haulage purposes in mines,* and AS 1656—1974, *Steel wire ropes (other than for mining purposes).*

The first Australian Standard for steel wire ropes, viz AS B9, *Round steel wire ropes for cranes and hoists,* was issued in 1938 and revised and redesignated AS B 185 in 1968.

In 1955, AS M4, *Steel wire ropes for winding and haulage purposes in mines,* was issued. This Standard was revised and metricated as AS 1426 in 1973.

In addition, the following Standards were produced in 1968:

AS B183 *Steel wire ropes for general purposes*
AS B184 *Steel wire ropes for lifts*
AS B186 *Steel wire ropes for field equipment*
AS B187 *Galvanized steel wire ropes for marine and other purposes.*

In 1974, AS B183 to AS B187 inclusive were revised and metricated and issued as AS 1656.

The Standard now covers steel wire ropes used for general purposes, for lifts, and for mine winding and haulage purposes. In addition to amalgamating AS 1426 and AS 1656 it has been expanded to include ropes not previously listed. Ropes no longer used have been deleted. The International (ISO) system of rope designation has been adopted.

The committee has suggested that the introduction of the ISO designation system be phased in over a period of two years. This time period is a matter for the industry to decide but, to assist in converting from the present Australian method to the ISO System, charts are included in which the constructions are labelled in the three systems, namely, the ISO construction, the abbreviated ISO construction, and the previous Australian Standard construction. As a further aid, charts are also included which give the method of describing the ISO designation system. The charts are not copyright so they may be reproduced for use as wallcharts or in other suitable ways for education or reference.

Appendices have been added which provide information to be supplied by purchasers, guidelines on the selection of ropes, examples of typical rope applications, method of calculating the minimum breaking force, and the previous Australian Standard rope designation system.

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APPENDICES

CHARTS (REDUCED)

STANDARDS AUSTRALIA

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Steel wire ropes

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This Standard specifies requirements for steel wire ropes.

NOTE: Guidelines are given in Appendix A for the purchasing of ropes and in Appendix B for rope selection. Appendix E sets out the previous designation method. For guidance on recommended procedures for the selection, storage, handling maintenance, use, inspection, and discard of helically laid steel wire ropes, see AS 2759.

1.2 REFERENCED DOCUMENTS. The following documents are referred to in this Standard:

AS

1394 Round steel wire for ropes

1821 Suppliers quality systems for design, development production and installation

1822 Suppliers quality systems for production and installation

1823 Suppliers quality inspection systems

2000 Guide to AS 1821-1823—Suppliers quality control systems

2193 Methods for calibration and grading of force-measuring systems of testing machines

2759 Steel wire rope—Application guide

ISO

3578 Steel wire ropes—Standard designations

BS

525 Fibre cores for wire ropes

NCB

186 Locked coil winding ropes

388 Half locked coil guide rope

1.3 DEFINITIONS. For the purpose of this Standard, the definitions below apply.*

1.3.1 Bright wire (NAT)—ungalvanized wire.

1.3.2 Closing—laying strands together to form a rope.

1.3.3 Core.

(a) *Core of strand*—the central member of a strand which may be one of the following (see also Figure 1.3):
(i) A single wire (king wire).
(ii) A group of wires.
(iii) A synthetic or natural material.

(b) *Core of rope*—the centre core of the rope around which the strands are laid. This may be one of the following:
(i) A wire strand core (IWS).
(ii) A wire rope core (IWR).
(iii) A fibre core (FC, NFT, SF).

1.3.4 Filler wire—wire used primarily for the spacing and support of the main wires in a strand, to allow for parallel laying of strand wires in one operation.

1.3.5 Galvanized (zinc-coated) rope—rope manufactured from zinc-coated wire complying with AS 1394.

1.3.6 Grade of rope—a number which corresponds to the value of the minimum tensile strength, in megapascals (MPa), of the outside wires of the rope.

NOTE: For ropes containing wires of various tensile strengths, each strength should be nominated.

1.3.7 Grade of wire—the minimum value of the tensile strength of the wire in megapascals (MPa), expressed as a number.

1.3.8 Lay—the manner, direction, and pitch in which the strands are laid around the centre of a rope, or in which the wires are laid around the centre of a strand.

1.3.9 Lay direction—

(a) Left-hand—the direction of lay as viewed which is in the same direction as the central part of the letter 'S' when the rope or strand is supported vertically. See Figure 1.4.

(b) Right-hand—the direction of lay as viewed which is in the same direction as the central part of the letter 'Z' when the rope or strand is supported vertically. See Figure 1.4.

1.3.10 Lay length—that distance in a strand or rope measured parallel to the longitudinal axis, in which the wire in the strand or the strand in the rope makes one complete turn (helix) about the axis of the strand or rope.

1.3.11 Lay, Lang's—a rope construction with the strands in the rope laid in the same direction as the outer layer of wires in the strands. See Figure 1.4.

1.3.12 Lay, ordinary—a rope construction with the strands in the rope laid in the opposite direction to the outer layer of wires in the strand. See Figure 1.4.

1.3.13 Layer—a group of strands in a rope, or a group of wires in a strand, laid consecutively around the core.

1.3.14 Minimum breaking force—the tensile force which a sample of the rope must withstand without breaking when loaded in the prescribed manner.

1.3.15 Multilayer stranded rope—rope with two or more layers of main rope strands laid around a core.

1.3.16 Nominal diameter—the diameter used for purposes of description.

1.3.17 Non-rotating rope—rope in which various layers of strands are laid right-hand and left-hand to minimize resultant torque.

* The letters in parenthesis (round brackets) after certain terms are the designation in accordance with Section 2.