

Australian Standard[®]

Sheave blocks for lifting purposes



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Sheave blocks for lifting purposes

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PREFACE

This Standard was prepared by Standards Australia Committee ME-025, Lifting Tackle, to supersede AS 2089—1993.

The objective of this Standard is to provide a specification for sheave blocks that are fit for purpose and to describe appropriate procedures for their testing and use, for reference by manufacturers, suppliers, testers, regulators and users.

This edition does not limit carrying capacity and includes a number of other changes, including additional definitions, revision of definition of working load limit (WLL) and deletion of safe working load (SWL) from any part of the Standard, allowances for friction due to sheaves and changes to the requirements for materials, dimensions of sheaves and surface finish. The Appendix regarding ships cargo blocks had been removed as a result of there being little application for them in these times. Any application of blocks on ships may be within the regulations of the classification society e.g., Lloyds, DNV, BV ABS and similar.

Statements expressed in mandatory terms in notes to tables are deemed to be requirements of this Standard.

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

Sheave blocks for lifting purposes

1 SCOPE

This Standard specifies requirements for general purposes sheave blocks or lifting mechanisms as specified in AS 1418.1.

NOTES:

- 1 Sheave blocks used for applications other than lifting may have sheaves that are smaller in diameter than those specified herein.
- 2 This Standard covers sheave blocks with any type of bearing (i.e., frictionless or friction) and with any type of operating means (i.e., power driven or manual).
- 3 This Standard does not cover sheave blocks for the conveyance of persons.
- 4 Guidance on information that should be supplied with enquiries and orders is given in Appendix A.
- 5 Standards for components that are used in lifting systems are listed in Appendix B.
- 6 Guidance on care and use is given in Appendix C.
- 7 Guidance on using sheave blocks for non-lifting applications is given in Appendix D.
- 8 Requirements for the determination of the working load limit is given in Appendix E.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

- | | |
|--------|---|
| 1065 | Non-destructive testing—Ultrasonic testing of carbon and low alloy steel forgings |
| 1171 | Non-magnetic testing—Magnetic particle testing of ferromagnetic products, components and structures |
| 1199 | Sampling procedures for inspection by attributes |
| 1199.0 | Part 0: Introduction to the ISO 2859 attribute sampling system |
| 1199.2 | Part 2: Sampling plans indexed by limiting quality (LQ) for isolated lot inspection |
| 1418 | Cranes, hoists and winches |
| 1418.1 | Part 1: General requirements |
| 1627 | Metal finishing—Preparation and pretreatment of surfaces |
| 1627.0 | Part 0: Method selection guide |
| 1627.6 | Part 6: Chemical conversion treatment of metals |
| 1650 | Hot-dipped galvanized coatings on ferrous articles |
| 1721 | General purpose metric screw threads |
| 1789 | Electroplated zinc (electrogalvanized) coatings on ferrous articles (batch process) |
| 1816 | Metallic materials |
| 1816.1 | Method 1: Brinell hardness test—Test method (ISO 6506-1:2005, MOD) |

AS	
2193	Calibration and classification of force-measuring systems
2318	Swivels for lifting applications
2741	Shackles
3501	Parallel screw threads of Whitworth form (BSW and BSF) and associated gauges and gauging practice
3569	Steel wire ropes
3777	Shank hooks and large-eye hooks—Maximum 60 t
AS/NZS	
4680	Hot-dipped galvanized coatings on ferrous articles
ISO	
9001	Quality management systems—Requirements
9004	Quality management systems—Guidelines for performance improvements
2082	Metallic coatings—Electroplated coatings of cadmium on iron or steel
HB 18	Conformity assessment
HB 18.28	Part 28: Guidance on a third-party certification system for products

3 DEFINITIONS

For the purpose of this Standard, the definitions below apply.

3.1 Competent person

Designated person, suitably trained, qualified by knowledge and practical experience, and with the necessary instruction to enable the required test and examination to be carried out.

3.2 Fall of rope

See part of rope (Clause 3.3).

3.3 Part of rope (fall of rope)

Any linear portion of rope leading to or from a sheave block (to a sheave or a becket) and subjected to tension (see Figure 1).

3.4 Self-coloured

A surface colour of closely adhering oxides resulting from heat treatment and subsequent handling during manufacture.

3.5 Shall

Indicates that a statement is mandatory.

3.6 Should

Indicates a recommendation.

3.7 Sheave block

An item of lifting tackle suitable for use with steel wire rope, natural fibre rope or synthetic filament rope comprising essentially a body frame or block shell, a head fitting, one or more sheaves, an axle pin and, if fitted, a becket.

NOTES:

- 1 A sheave block normally forms part of a rope purchase or rig and may also be known as a pulley block, snatch block or a tackle block.

- 2 Sheave blocks of one, two, three, four or five sheaves are respectively known as single-sheave blocks, double-sheave blocks, treble-sheave blocks, four-sheave blocks or five-sheave blocks (see Figure 2).
- 3 For components of sheave blocks, see Clause 3.12; nominal size of sheaves and sheave blocks, see Clause 3.9; operation of sheave blocks, see Clause 3.10; and types of sheave blocks, see Clause 3.11.

3.8 Working load limit (WLL)

The maximum load that may be applied between the head fitting of the sheave block and the ropes around its sheaves, in tension along the load axis of the body, under general conditions of use.

NOTE: The working load limit may be de-rated for the particular application.

3.9 Nominal size of sheaves and sheave blocks

The outside diameter of the sheave, expressed in millimetres (see Figure 3).

3.10 Operation of sheave blocks

3.10.1 *Manual operation*

Operation powered by only a manually applied force.

3.10.2 *Power operation*

Operation powered by other than only a manually applied force.

3.11 Types of sheave block (see Figure 4)

3.11.1 *Lead block*

A single sheave block normally used to change the direction of the hauling part of the rope.

3.11.2 *Snatch block*

A sheave block with rotating side plate, a gate or hinged portion through which a rope can be passed from the side to facilitate reeving.

3.12 Components of sheave blocks (see Figure 5)

3.12.1 *Axle*

A component on which a sheave rotates.

3.12.2 *Bearing*

A part allowing for free rotation of a sheave under load.

3.12.3 *Becket*

The tail fitting on a block to which one end of rope used in the purchase may be fixed or anchored (see also Figure 6).

NOTE: Typically, beackets are in the form of a shackle, a plate link or a spool.

3.12.4 *Block shell*

The framework of a block assembly, including sheave axles, but excluding sheaves.

3.12.5 *Crosshead*

A cross-member connecting the upper parts of side straps, to which the shank of a head fitting is attached.

3.12.6 *Head fitting*

The means by which a block is attached to its anchorage or supporting structure, or to the load being lifted (see also Figure 7).

NOTE: The head fitting may be in the form of a hook, eye, shackle or other fitting.

3.12.7 *Identification plate or marking*

Information provided on the sheave block in accordance with Clause 7.

3.12.8 *Partition plate*

A plate separating sheaves.

3.12.9 *Side plate*

A plate separating side straps and sheaves or plates designed as loadbearing members to perform the function of side straps.

3.12.10 *Side strap*

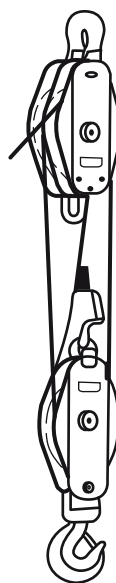
A loadbearing member on the side of a block, a set of which carries a crosshead, an axle and a becket.

3.12.11 *Sheave*

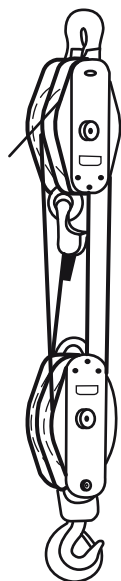
A grooved wheel that is free to rotate (see also Figure 3).



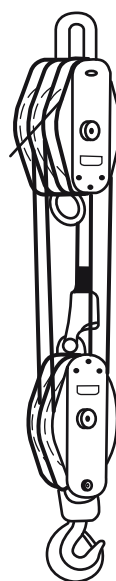
(a) Two parts of rope



(b) Three parts of rope



(c) Four parts of rope



(d) Five parts of rope

FIGURE 1 PARTS OF ROPE (see Clause 3.3)

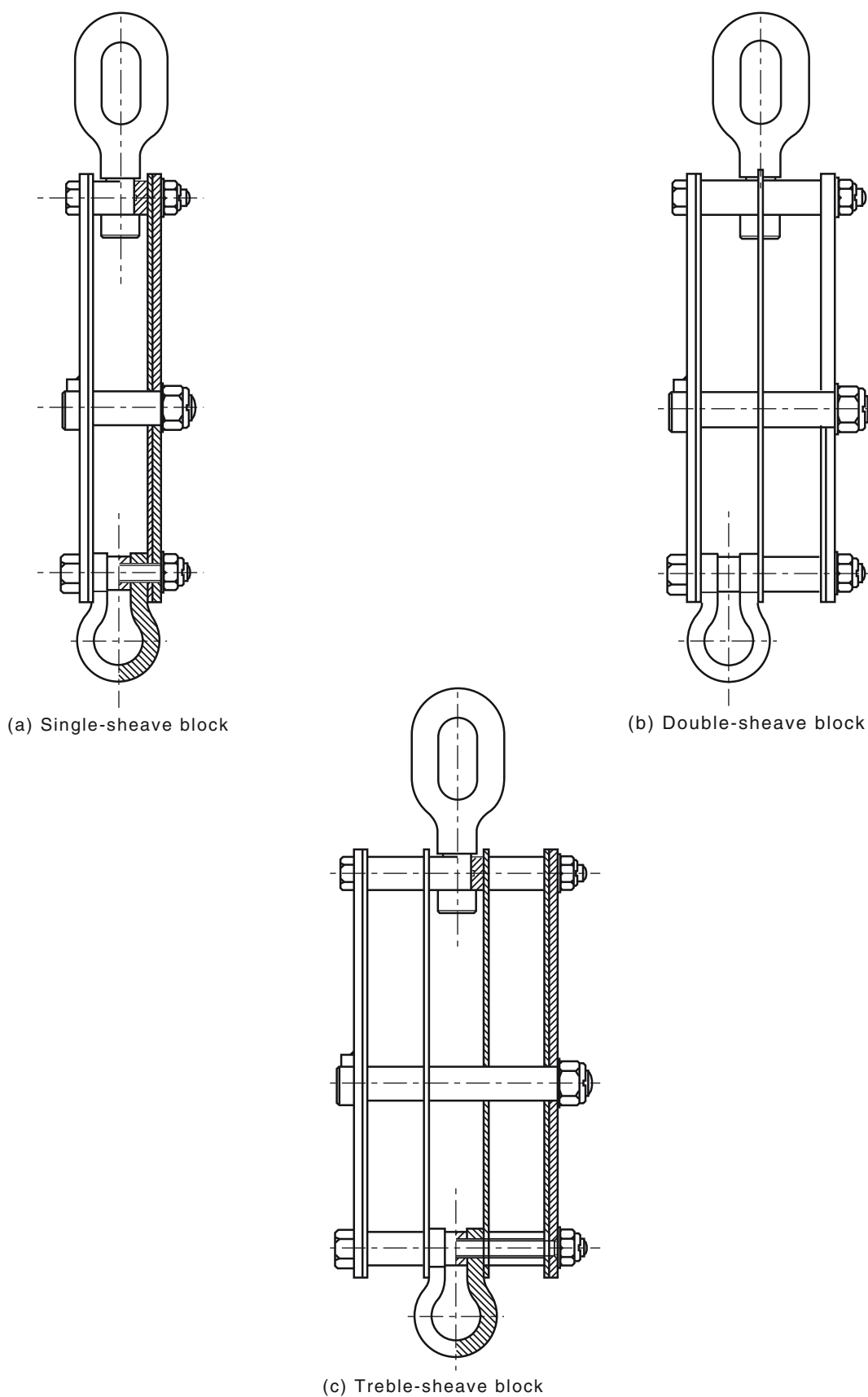


FIGURE 2 TYPICAL BLOCK SHELLS

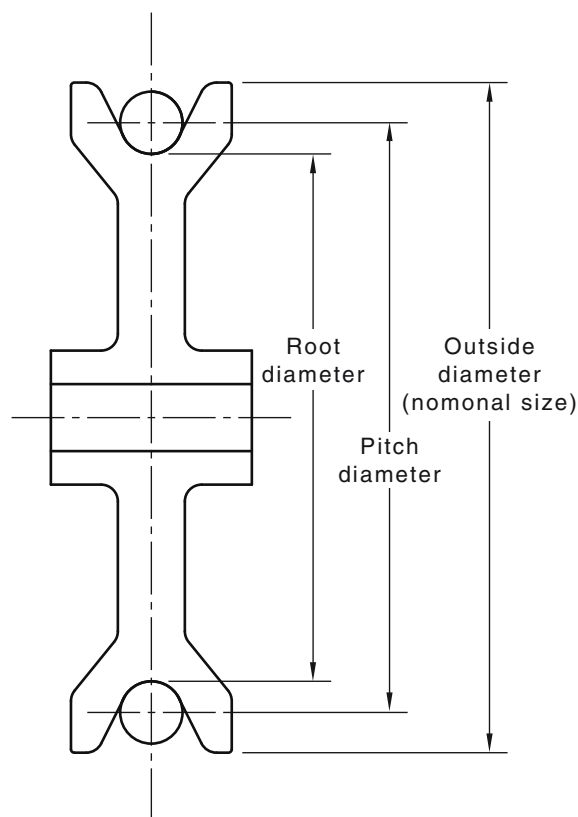


FIGURE 3 SHEAVE

4 MATERIALS

4.1 Steel sections, plates, forgings and cast steels

Steel materials used for block components carrying primary structural loads shall—

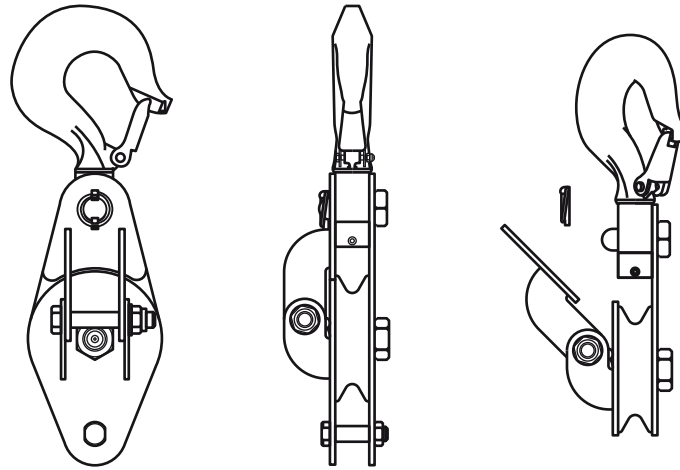
- (a) comply with a recognized Australian or International Standard;
- (b) have a carbon content not exceeding 0.46%; and
- (c) have properties such that they will demonstrate ductility when used in their intended operating environment.

4.2 Castings

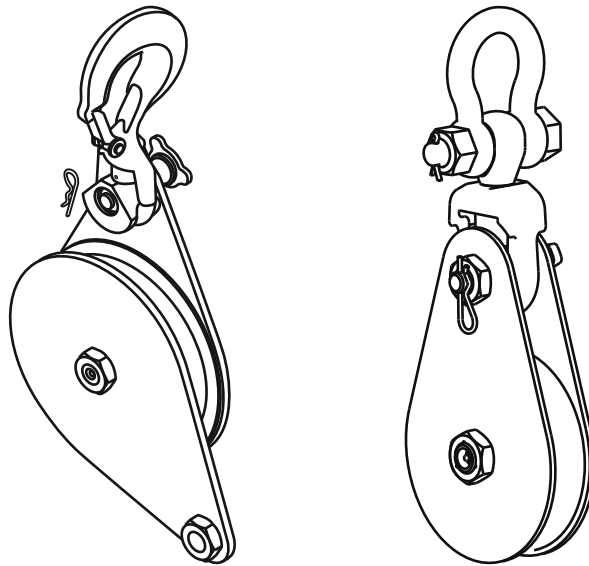
Cast components shall be subject to non-destructive testing appropriate to the component.

4.3 Other materials

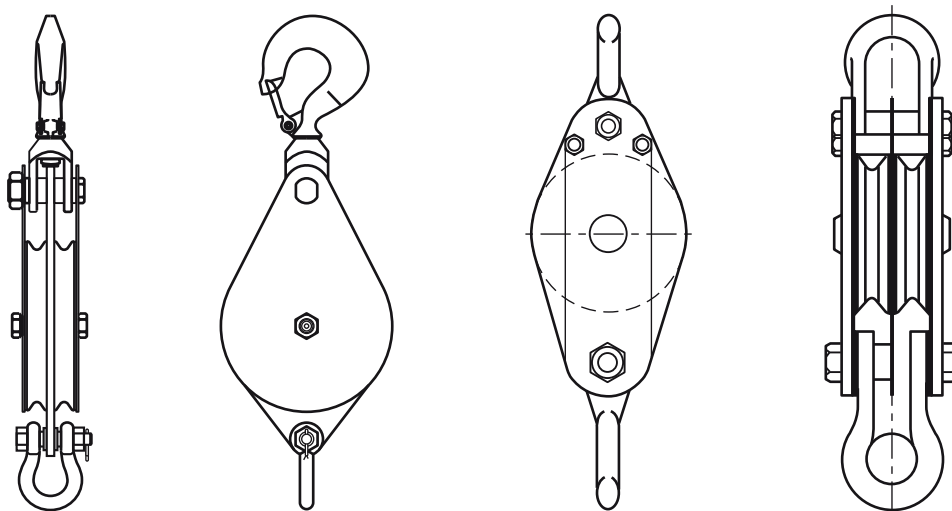
This Standard is not intended to preclude the use of materials that are not specified in Clause 4.1 but meet the intent of this Standard (e.g., aluminium, cast iron, bronze, nylon etc.).



(a) Snatch block with hinged side plate for rope access



(b) Snatch block with snatch pin and locking pin



(c) Some other styles of sheave block

FIGURE 4 TYPICAL TYPES OF SHEAVE BLOCK