

Specification for

Pulley blocks for use with natural and synthetic fibre ropes

Co-operating organizations

The Mechanical Engineering Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

Associated Offices' Technical Committee	Institution of Civil Engineers
Association of Consulting Engineers	Institution of Gas Engineers
Association of Mining Electrical and Mechanical Engineers	Institution of Heating and Ventilating Engineers
Board of Trade	Institution of Mechanical Engineers
British Chemical Plant Manufacturers' Association	Institution of Mechanical Engineers (Automobile Division)
British Compressed Air Society	Institution of Production Engineers
British Electrical and Allied Manufacturers' Association	Locomotive and Allied Manufacturers' Association of Great Britain
British Gear Manufacturers' Association	London Transport Board
British Internal Combustion Engine Manufacturers' Association	Machine Tool Trades Association
British Mechanical Engineering Federation	Ministry of Defence
British Pump Manufacturers' Association	Ministry of Defence, Army Department*
British Steel Industry	Ministry of Labour (H.M. Factory Inspectorate)*
Crown Agents for Oversea Governments and Administrations	Ministry of Power
Electricity Council, the Central Electricity Generating Board and the Area Boards in England and Wales	Ministry of Public Building and Works
Engineering Equipment Users' Association*	Ministry of Technology (Aviation)
Gas Council	Ministry of Technology — National Engineering Laboratory
Institute of Marine Engineers	Ministry of Transport
	National Coal Board
	National Physical Laboratory (Ministry of Technology)
	Royal Institute of British Architects

The Government departments and scientific and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

British Constructional Steelwork Association	Ministry of Defence, Air Force Department
Chain Testers' Association of Great Britain	Ministry of Defence, Navy Department
Dock and Harbour Authorities Association	National Association of Iron and Steel Stockholders
Federation of Civil Engineering Contractors	National Association of Scaffolding Contractors
Federation of Wire Rope Manufacturers of Gt. Britain	National Federation of Building Trades Employers
Honourable Company of Master Mariners	National Federation of Demolition Contractors
Lifting Equipment Manufacturers' Association	Ship and Boat Builders' National Federation
Lloyd's Register of Shipping	Synthetic Cordage Manufacturers' Association
Machine Made Chain Manufacturers' Association	Individual companies

This British Standard, having been approved by the Mechanical Engineering Industry Standards Committee and endorsed by the Chairman of the Engineering Divisional Council, was published under the authority of the General Council on 20 September 1968

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Foreword

This standard makes reference to the following British Standard:

BS 919, *Screw gauge limits and tolerances.*

BS 970, *Wrought steels.*

BS 1452, *Grey iron castings.*

BS 1486, *Lubricating nipples.*

BS 1610, *Methods for the load verification of testing machines.*

BS 1936, *Undercuts and runouts for screw threads.*

BS 2052, *Ropes made from coir, hemp, manila and sisal.*

BS 2789, *Iron castings with spheroidal or nodular graphite.*

BS 2902, *Higher tensile steel chain slings.*

BS 3032, *Higher tensile steel shackles.*

BS 3100, *Steel castings for general engineering purposes.*

BS 3758, *Polyester filament ropes (hawser laid).*

BS 3912, *Polythene filament ropes (hawser laid).*

BS 3977, *Polyamide (nylon) filament ropes (hawser laid).*

The present standard is one of a series of British Standards for rigs and for the elements (blocks, rope, winches, etc.) of which they are composed. It supersedes BS 1839¹⁾ for natural fiber rope, whilst providing also for the more recently developed synthetic fiber ropes. Very approximately the strengths of natural fibre, polyester, polythene and wire ropes are in the ratio 1, 2.2, 3, 10.

The design (Clause 3) requires specific overload performance, and provision is made for an optional test to prove the design (Clause 16). Such an approach does not require an overall design factor, and therefore a factor of safety is not specified. In applying this concept, it is important that the evidence of sample tests and the material control should be given.

It has not been found practicable to specify that all blocks shall be designed to be reeved with rope to one particular standard. Man-made synthetic fibre ropes used with pulley blocks are made of many different materials with widely varying properties, including strength. Furthermore, development of synthetic materials with new properties and enhancement of the properties of existing materials are likely to continue. Fortunately a block designed for one grade of rope can be used satisfactorily with a stronger grade of smaller diameter having the same breaking strength. Such use does not violate the standard in any way, and the manufacturer can therefore allow for more than one grade of rope (see Clause 4).

The marking of the safe working load is based on the number parts of rope in the fall. A single-sheave block can have two or even three safe working loads according to how it is rigged. This cannot be indicated by marking which takes no account of the rig.

The marking of the safe working load on the snatch block will be the same as that on the single-sheave block. When selecting a snatch block for an offset (or straight pull), care should be taken to select one of adequate strength to withstand the resultant load imposed on the head fitting of the block.

To minimize the likelihood of overheating, or of electrostatic build-up, the maximum rope velocity has been kept to a figure of 0.5 m/s.

¹⁾ BS 1839, "London pattern pulley blocks for natural fibre rope (withdrawn)".

To enable full advantage to be taken of the use of new materials in the design of blocks for use with man-made fibre ropes, it is desirable to allow the block designer somewhat greater latitude in the use of materials, bearing pressures, etc., than has been done in the case of pulley blocks for steel wire ropes, BS 4018²⁾. The efficient working performance of the block, within the limits of the specified safe working load, is the responsibility of the designer and manufacturer.

In view of the world trend towards the metric system of units, these units are used in this standard in their *Système Internationale* (SI) form, based on the metre (m), the kilogram (kg) and the second (s).

NOTE Information regarding SI units is given in BS 350, *“Conversion factors and tables”* and in PD 5686, *“The use of SI units”*.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 7 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

²⁾ BS 4018, *“Pulley blocks for use with wire rope to lift up to 25 tonf in combination”*.