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# Australian Standard 2317—1979

# EYEBOLTS

STANDARDS ASSOCIATION OF AUSTRALIA
*Incorporated by Royal Charter*

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THE FOLLOWING SCIENTIFIC, INDUSTRIAL AND GOVERNMENTAL ORGANIZATIONS and departments were officially represented on the committee entrusted with the preparation of this standard:

Australasian Steamship Owners Federation

Australian Chamber of Commerce

Bureau of Steel Manufacturers of Australia

Confederation of Australian Industry

Department of Defence

Department of Industrial Relations and Technology, N.S.W.

Department of Labour and Industry, South Australia

Department of Labour and Industry, Tasmania

Department of Labour and Industry, Victoria

Department of Labour Relations, Queensland

Department of Mines and Energy, Northern Territory

Department of Productivity

Department of the Capital Territory

Department of Transport

Electricity Supply Association of Australia

Master Builders Association of N.S.W.

Metal Trades Industry Association of Australia

Railways of Australia Committee

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AUSTRALIAN STANDARD

# EYEBOLTS

## AS 2317—1979

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# PREFACE

This standard was prepared by the Association's Committee on Lifting Tackle as a metrication and revision of AS B284—1969, Eyebolts for Lifting Purposes, which it accordingly supersedes.

It is one of a series of standards for components of lifting systems and staying and tensioning systems. Other standards dealing with lifting systems and staying and tensioning systems are as follows:

| | |
|---|---|
| AS 1138 | Thimbles for Use with Wire Rope or Fibre (Natural or Synthetic) Rope |
| AS 1353 | Synthetic-webbing Flat Slings |
| AS 1380 | Fibre-rope Slings (of Natural or Synthetic Rope) |
| AS 1438 | Wire-coil Flat Slings |
| AS 1656 | Steel Wire Ropes (Other Than for Mining Purposes) |
| AS 1666 | Wire Rope Slings |
| AS 2076 | Wire Rope Grips |
| AS 2089 | Sheave Blocks (Including Ships' Cargo Blocks) of Maximum Lift 60 t |
| AS 2318 | Swivels |
| AS 2319 | Rigging Screws and Turnbuckles |
| AS 2321 | Short-link Chain for Lifting Purposes—Non-calibrated |
| *AS B278 | Shackles for Lifting Purposes |
| *AS B283 | Bordeaux Connections |
| *AS B291 | Lifting Rings and Links |
| *AS MB1 | SAA Steel Wire Rope Manual |

Australian standards are being prepared for other components which are used with lifting systems and with staying and tensioning systems. They are: chain slings, hooks, and wedge-type sockets for wire rope.

This standard is prepared as a 'performance' rather than a 'dimensional' standard. It covers only steel eyebolts with collars used for general lifting purposes, and staying and tensioning purposes, therefore the title has been altered accordingly. Eyebolts with links have been excluded because the committee considered it preferable that lifting slings be attached to eyebolts by means of shackles. The diameter of the eye is larger than previously specified in AS B284, and is in accordance with the recommendations of ISO†, but the thread length of 1.5 times the nominal outside diameter of the thread has been maintained to ensure sufficient thread length in tapped holes in low tensile strength materials such as grey cast iron.

Eyebolts smaller than 12 mm nominal size are excluded from this standard because of the danger of the creation of high torsional stress should the eyebolt be screwed up too tightly during fitting. Eyebolts smaller than 12 mm nominal size are therefore not recommended for use for general lifting purposes and staying and tensioning purposes.

The opportunity has been taken to align material designations with those adopted by the ISO/TC 111, Round Steel Link Chains, Chain Wheels, Lifting Hooks and Accessories. ISO has made provision for the following tabulated grades, and those adopted by the committee for lifting tackle equipment standards in Australia are designated as the preferred grades:

| *Preferred grade* | *Non-preferred grade* | *Old grade designation* |
|---|---|---|
| L | — | Lower tensile steel |
| — | M | Higher tensile steel |
| P | — | Higher tensile steel |
| — | S | Alloy steel |
| T | — | Alloy steel |
| — | V | — |

Not all of these preferred grades are designated for each lifting tackle product. Some are restricted to recommendation of one grade only, e.g. AS ...., Bordeaux Connections, designates the preferred grade P and this standard designates the non-preferred grade M. Owing to local conditions and requirements, the Australian designated preferred grades for the various products differ from those grades nominated by ISO for comparable products. To date there is no ISO standard for eyebolts but it is in the course of preparation.

Guidance regarding the safe working loads of eyebolts used in pairs is given in Appendix A, and Appendix C examines details on the fitting of eyebolts used in pairs. It also suggests precautions to be taken against the fitting of eyebolts with metric threads into tapped holes having a BSW or UNC thread, or *vice versa*. It is recommended that the body be marked and possibly a plug inserted in the threaded hole when an eyebolt is removed.

Information to be supplied with enquiry and order to ensure that the manufacturer or supplier quotes on and supplies the correct eyebolt to fulfil the requirements of the purchaser is provided in Appendix B. Appendix D covers eyebolt finishes other than self-colour.

This standard may require reference to the following Australian standards:

| | |
|---|---|
| AS 1057 | Glossary of Terms Used in Quality Control |
| AS 1275 | Metric Screw Threads for Fasteners (Based on ISO Recommendations) |
| AS 1391 | Methods for Tensile Testing of Metals |
| AS 1418 | SAA Crane Code |
| AS 1442 | Carbon Steels and Carbon-manganese Steels—Hot-rolled Bars and Semi-finished Products |
| AS 1444 | Wrought Alloy Steels of the AISI-SAE H and Standard Steels Types |
| AS 1627 | Code of Practice for Preparation and Pretreatment of Metal Surfaces Prior to Protective Coating<br>Part 6—Phosphate Treatment of Iron and Steel Surfaces |

*In course of metrication and revision.
†International Organization for Standardization.

| | | | |
|---|---|---|---|
| AS 1650 | Galvanized Coatings on Ferrous Articles | AS 1789 | Electroplated Coatings of Zinc on Iron and Steel |
| AS 1654 | Limits and Fits for Engineering | AS 1790 | Electroplated Coatings of Cadmium on Iron and Steel |
| AS 1721 | General Purpose Metric Screw Threads | AS B199 | Undercuts and Runouts for Screw Threads |

## CONTENTS

STANDARDS ASSOCIATION OF AUSTRALIA

# Australian Standard for EYEBOLTS

## FOREWORD

**NOTE: Eyebolts welded during manufacture or subsequently are excluded from this standard. Welding is potentially dangerous in eyebolts.**

Eyebolts covered by this standard are of quality grade M only. It is one of the quality grades identified by a letter in the series L, M, P, S and T. The range of quality grades extends from 'lower tensile' steel eyebolts (quality grade L) through 'higher tensile' steels (quality grades M and P) to 'alloy' steel eyebolts (quality grades S and T).

This quality grading system applies not only to eyebolts, but also to swivels, rings and/or other accessories, which together form a lifting system or a staying and tensioning system. It relates to the mechanical properties of the finished product and not solely to the strength of the material. For example, an eyebolt of a given quality grade and lifting capacity is capable of being matched by shackles of the same quality grade and lifting capacity to form a lifting system of compatible components. It is, therefore, important that all components of such a lifting system may be quickly and positively identified in service for size, lifting capacity and quality grade. Likewise, the same principle is applicable to the matching of quality grade and load rating of compatible components in a staying and tensioning system.

The materials specified for the eyebolts are the same as those specified in other Australian standards for other components of lifting tackle. Steels to Australian standards have been specified but other approved materials may be used. Heat treatment appropriate to the grade of steel used is also specified.

Eyebolts are used in lifting systems and in staying and tensioning systems. The collar on an eyebolt adds substantially to its load-carrying capacity where the eyebolt is correctly fitted to the item to be lifted, stayed or tensioned.

The safe working load of the eyebolt and that of other components constituting a lifting system is to be compatible with the load inherent in or applied to the system.

The eyebolt load rating and that of other components constituting a guy or other staying or tensioning system is to be compatible with the loading inherent in or applied to the staying or tensioning system.

# SPECIFICATION

**1 SCOPE.** This standard specifies requirements for forged eyebolts for general lifting purposes and staying and tensioning purposes having shank diameters between 12 mm and 100 mm, and eye diameters suitable for use with a shackle. Materials, heat treatment, key dimensions, manufacture, testing, marking and certification are specified.

NOTES:

1. For eyebolts other than self-coloured, see Appendix D.
2. For information that should be supplied with an enquiry or order, see Appendix B.

**2 DEFINITIONS.** For the purpose of this standard, the following definitions apply.

**2.1 Approved and approval**—approved by or the approval of the Statutory Authority.

**2.2 Finished condition**—the condition of an eyebolt after completion of all processing and proof loading.

**2.3 Processing**—any treatment of the eyebolts subsequent to forging, e.g. heat treatment, but excluding proof loading and temporary protective coating.

**2.4 Proof load**—the minimum force to which after processing (see Clause 2.3) the eyebolt is subjected as specified in Clause 10.3 and Table 4.

**2.5 Self-colour**—an eyebolt of self-colour is one with the surface finish arising from the essential manufacturing operations, the surface finish usually being a closely adhering oxide film due to the heat treatment and subsequent handling.

**2.6 Shall and should**—'shall' is taken to be mandatory; 'should' is taken to be advisory.

**2.7 Statutory Authority**—an authority having statutory powers to control the design, manufacture and use of lifting tackle in the State or Territory within the Commonwealth of Australia in which the lifting tackle is to be used.

**3 NOMINAL SIZE.** The nominal size of the eyebolt shall be the nominal outside diameter of the thread of the screwed shank.

**4 DIMENSIONS AND TOLERANCES.**

**4.1 Dimensions.** Eyebolts shall conform to the dimensions specified in Table 1 and Fig. 1.

NOTE: The portion of the shank adjacent to the collar shall be undercut to conform to Clause 9.2.

**TABLE 1**
**EYEBOLT DIMENSIONS**

millimetres

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Nominal size and *A* | *B* | | *F* | *H* min. |
| M12 | 28 | | 9.5 | 23 |
| M16 | 34 | 34 | 12.5 | 30 |
| M20 | 40 | 40 | 16 | 38 |
| M24 | 48 | 48 | 19 | 45 |
| M30 | 56 | 56 | 24 | 56 |
| M36 | 67 | 67 | 28 | 66 |
| M42 | 80 | 80 | 34 | 77 |
| M48 | 95 | 95 | 38 | 87 |
| M56 | 112 | 112 | 45 | 101 |
| M64 | 125 | 125 | 50 | 114 |
| M[illegible] × 6 | 140 | 140 | 58 | 126 |
| [illegible]80 × 6 | 160 | 160 | 63 | 138 |
| M[illegible]0 × 6 | 180 | 180 | 71 | 153 |
| M100 × 6 | 200 | 200 | 80 | 168 |

**4.2 Tolerances.**

**4.2.1** *Forging tolerances.* The dimensions of the unmachined portion of the eyebolt shall be not less than the dimensions given in Table 1. The tolerance on the internal diameter of the eyebolt shall be + 5 percent. The tolerance on the displacement of the axis of the shank in relation to the axis of the eye, in the plane of the eye and at right angles to the plane of the eye, shall be ± 5 percent.

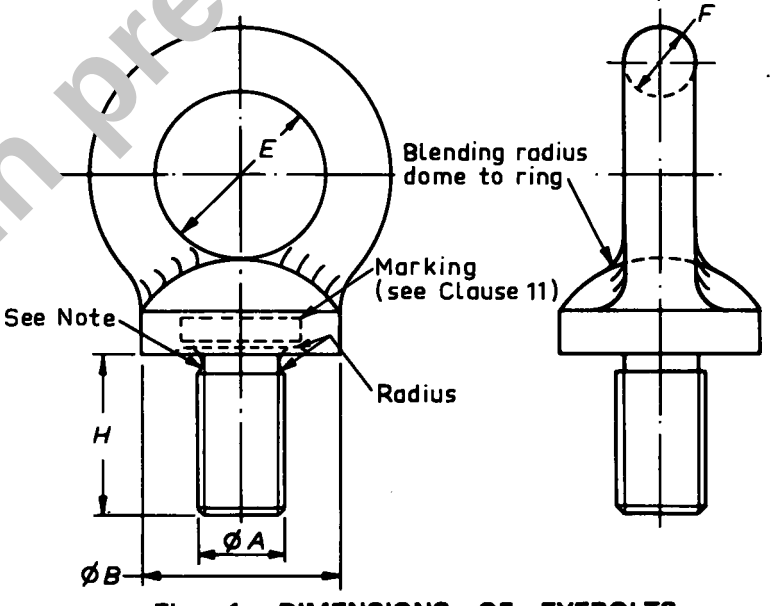


Fig. 1. DIMENSIONS OF EYEBOLTS