Railway Track Material –
Part 4: Fishbolts and Nuts

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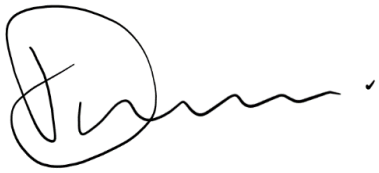
The Infrastructure Standing Committee verified that RISSB's accredited process was followed in developing the product, before the RISSB Board approved the document for publication.

RISSB wishes to acknowledge the positive contribution of subject matter experts in the development of this Standard. Their efforts ranged from membership of the Development Group through to individuals providing comments on a draft of the Standard during the open review.

I commend this Standard to the Australasian rail industry as it represents industry good practice and has been developed through a rigorous process.



Damien White
Chief Executive Officer
Rail Industry Safety and Standards Board

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Document history

Publication Version	Effective Date	Reason for and Extent of Change(s)
2024	21 October 2024	This document has been reviewed to ensure it remains relevant and applicable. The latest review assessed the content, confirming that while updates were made to align with current industry practices, technologies, and regulatory requirements, the original authorship and copyright have been acknowledged as required.

Approval

Name	Date
Rail Industry Safety and Standards Board	2 October 2024

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Preface

The modifications in this edition acknowledge the authorship and copyright of the new updates as per the terms of the agreement

Objective

The objective of this Standard is to provide manufacturers and purchasers with manufacturing and performance requirements for oval-necked fishbolts and nuts for use with fishplates and spring washers in railway track in accordance with the AS 1085 series of Standards.

Compliance

There are four types of provisions contained within Australian Standards developed by RISSB:

(a) Requirements.

(b) Recommendations.

(c) Permissions.

(d) Constraints.

Requirements – it is mandatory to follow all requirements to claim full compliance with the Standard. Requirements are identified within the text by the term ‘shall’.

Recommendations – do not mention or exclude other possibilities but do offer the one that is preferred. Recommendations are identified within the text by the term ‘should’.

Recommendations recognize that there could be limitations to the universal application of the control, i.e. the identified control is not able to be applied or other controls are more appropriate or better.

Permissions – conveys consent by providing an allowable option. Permissions are identified within the text by the term ‘may’.

Constraints – provided by an external source such as legislation. Constraints are identified within the text by the term ‘must’.

For compliance purposes, where a recommended control is not applied as written in the standard it could be incumbent on the adopter of the standard to demonstrate their actual method of controlling the risk as part of their WHS or Rail Safety National Law obligations. Similarly, it could also be incumbent on an adopter of the standard to demonstrate their method of controlling the risk to contracting entities or interfacing organisations where the risk may be shared.

Appendices in RISSB Standards may be designated either “normative” or “informative”. A "normative" appendix is an integral part of a Standard and compliance with it is a requirement, whereas an "informative" appendix is only for information and guidance.

Commentary

Commentary *C Preface*

This Standard includes a commentary on some of the clauses. The commentary directly follows the relevant clause, is designated by ‘C’ preceding the clause number and is printed in italics in a box. The commentary is for information and guidance and does not form part of the Standard.

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Section 1 Scope and general

1.1 Scope

This Standard provides technical requirements for design, manufacturing, installation and quality assurance of fishbolts and nuts as part of a railway track assembly with fishplates.

The document includes specifications for manufacturing processes, chemical composition, mechanical properties, and thread dimensions, along with the required finish for fishbolts.

Associated nut fittings are expected to comply with relevant Australian Standards as referenced in this document.

Quality assurance for the manufacture and supply of fishbolts is addressed in this Standard through statistical sampling, product certification, or supplier quality systems, with alternative compliance methods also outlined.

1.2 Normative references

The following documents are referred to in the text in such a way that *some* or all of their content constitutes requirements of this document:

- AS 1085.1, *Railway Track Material – Part 1: Steel Rails*
- AS 1085.2, *Railway Track Material – Part 2: Fishplates*
- AS 1085.7, *Railway Track Material – Part 7: Spring Washers*
- AS 1199, *Sampling procedures and tables for inspection by attributes*
- AS 1275, *Metric screw for fasteners*
- AS 1391, *Methods for tensile testing of metals*
- AS 1399, *Guide to AS 1199 – Sampling procedures and tables for inspection by attributes*
- AS 1442, *Carbon steels and carbon-manganese steels – Hot-rolled bars and semi-finished products*
- AS 2706, *Numerical values – Rounding and interpretation of limiting values*
- AS 4291, *Mechanical properties of fasteners made of carbon steel and alloy steel*
- AS 4291.1, *Part 1: Bolts, screws and studs*
- AS/NZS 1252, *High-strength steel bolts with associated nuts and washers for structural engine*
- ISO 9001, *Quality management systems – Requirements*
- ISO 9004, *Quality management systems Guidelines for performance improvements*
- HB18, *Guidelines for third-party certification and accreditation*
- HB18.28, *Guidelines for third-party certification and accreditation – Guide 28 – General rules for a model third-party certification scheme for products*

NOTE:

Documents for informative purposes are listed in a Bibliography at the back of the Standard.

1.3 Defined terms and abbreviations

For the purposes of this document, the following terms and definitions apply:

1.3.1
chamfer
a bevelled edge connecting two surfaces

1.3.2
elongation
the degree to which a material can be stretched before breaking

1.3.3
fishbolts and nuts
components used with fishplates to connect lengths of rail in railway tracks

1.3.4
fishplates
metal bars that are bolted to the ends of two rails to join them together in a track

1.3.5
grip length
the distance from the bearing face of the bolt to the first full thread

1.3.6
hardened and tempered
heat treatment processes to increase the hardness and strength of the fishbolts

1.3.7
head radius
the radius of the curved part of the bolt head

1.3.8
head thickness
the distance from the top to the bottom of the bolt head

1.3.9
hot or cold forging
manufacturing processes involving shaping metal using heat (hot forging) or at room temperature (cold forging)

1.3.10
ISO coarse series 6 g
an international standard for screw thread dimensions and tolerances

1.3.11
laps
small overlaps of material on the crest of the thread formed during the rolling process

1.3.12
length of unthreaded shank
the portion of the shank that does not have threads

1.3.13
nominal length
the specified length of a bolt from the underside of the head to the end of the shank

1.3.14
oval section
the cross-sectional shape of the shank of a fishbolt

1.3.15
radius under head
the curved transition between the head and the shank

1.3.16
secondary machining
additional machining processes after initial shaping to achieve the final dimensions and finish

1.3.17
screw threads
the helical structure used on the bolts to enable fastening

1.3.18
shank
the part of the bolt between the head and the thread

1.3.19
stress at permanent set limit
the stress level at which a material undergoes a defined permanent deformation

1.3.20
tensile strength
the maximum stress that a material can withstand while being stretched or pulled

1.3.21
thermal expansion and contraction
the increase and decrease in size of the rails due to temperature changes

1.3.22
thread cutting
a process of forming screw threads by cutting into the bolt blank

1.3.23
thread rolling
a process of forming screw threads by rolling the bolt blank between dies

1.3.24
tensile strength
the maximum stress that a material can withstand while being stretched or pulled

General rail industry terms and definitions are maintained in the RISSB Glossary. Refer to:
https://www.rissb.com.au/products/glossary/