

Wheel and Rail Profile Development

GUIDELINE



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Document Control

Identification

Document Title	Number	Version	Date
Guideline for Wheel and Rail Profile Development	1	1.00	11 December 2013

Document History

Publication Version	Effective Date	Page(s) Affected	Reason for and Extent of Change(s)
First draft	21/09/2012	N/A	N/A
Second draft	16/08/2013	Various	Updated in response to comments received from first open public consultation that closed on 15 April 2013, and DG meeting on 12 August 2013.
Third draft	19/09/2013	Section 2.1, p.10, 3rd bullet point; Section 4.4, Table 2.2, both as marked	Updated in response to comments received from second open public consultation that closed on 13 September 2013.
Fourth (final) draft	24/10/2013	Section 1.3, Section 2.7.5 para. 2, Section 4.1 bullet point 7, Section 4.3.4 bullet point 3, other minor corrections, as marked.	Minor amendments requested by RISSB and DG prior to publication.
Published Version 1.00	11/12/2013 (10/05/2018)	Front page and footer date error corrected	Desktop publishing. Formatting to RISSB template. Non-material minor repair – no change to publication version applied

Authoring & Approval

	Name	Date
Prepared By	RISSB	24 October 2013
Approved By	Rail Industry Safety and Standards Board	26 November 2013

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The RISSB will identify and communicate changes to this publication.

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1 Introduction

1.1 Purpose

The objectives of the Guideline for Wheel and Rail Profile Development are to:

- Provide good practice guidance on assessing wheel and rail profiles theoretically and in the field (in service).
- To provide a change management process for developing, testing and implementing new wheel and/or rail profiles.

1.2 Scope

This Guideline is applicable to all Australian rail networks, including narrow, standard and broad gauge railways.

It is not intended to cover light rail networks that may have different requirements.

1.3 Definitions

For the purposes of this Guideline the definitions given in the Australian Guideline of Practice – Glossary of Railway Terminology (Reference 2) shall apply. The following definitions are specific to this guideline.

Term	Definition
Conformal contact	The general condition where the wheel and rail profiles have similar shapes resulting in a large contact area.
Closely conformal contact	The condition where the wheel and rail profiles have such similar shapes that the gap between the unloaded wheel and rail profiles is about 0.1mm or less. Once loaded, the elastic deformation of the wheel and rail should close the gap such that there is a wide contact band around 25-40mm in width.
Conicity	Conicity is a measure of the effective cone angle of the wheelset on the rails. For example, a wheel with a coned profile that has a slope of 1:20 that is sitting on rails with a convex head would be expected to have a conicity of 0.05 (i.e. 1/20). Mathematically, the conicity is calculated as one-half of the slope of the graph of rolling radius difference versus wheelset lateral shift.
Contact stress (P_0)	Maximum wheel/rail contact stress in the direction normal to the plane of contact.
Creepage	Relative movement between the wheel and rail with longitudinal, lateral and spin components.
Creep forces	Forces associated with longitudinal, lateral and spin creepage.
False flange	Raised portion of the wheel towards the outer edge of the wheel tread.