This is a preview of "ISO 5003:2016". Click here to purchase the full version from the ANSI store.

Second edition 2016-03-01

# Flat bottom (Vignole) railway rails 43 kg/m and above

Rails Vignole de masse supérieure ou égale à 43 kg/m



Reference number ISO 5003:2016(E)

#### ISO 5003:2016(E)

This is a preview of "ISO 5003:2016". Click here to purchase the full version from the ANSI store.



#### COPYRIGHT PROTECTED DOCUMENT

© ISO 2016, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office Ch. de Blandonnet 8 • CP 401 CH-1214 Vernier, Geneva, Switzerland Tel. +41 22 749 01 11 Fax +41 22 749 09 47 copyright@iso.org www.iso.org This is a preview of "ISO 5003:2016". Click here to purchase the full version from the ANSI store.

Coi	orewordv				
Fore					
1	Scop	e	1		
2	Norn	native references	1		
3		is and definitions			
4	Information to be supplied by the purchaser				
5		Test methods			
	5.1	Test items, testing frequency and test methods			
	5.2	Chemical composition			
	5.3	Hydrogen content			
	5.4 5.5	Total oxygen content Tensile test			
	5.6	Hardness			
	5.0	5.6.1 General requirements			
		5.6.2 Surface hardness			
		5.6.3 Internal hardness			
	5.7	Microstructure	5		
	5.8	Decarburization			
	5.9	Non-metallic inclusions			
		5.9.1 General requirements			
	<b>5</b> 40	5.9.2 Testing methods			
	5.10	Macrostructure			
	5.11	Ultrasonic test			
		5.11.1 Testing area			
		5.11.3 Calibration rails	6		
	5.12	Residual stress			
	0.112	5.12.1 Test sample rail			
		5.12.2 Test pieces			
		5.12.3 Test method			
	5.13	Fracture toughness (K <sub>Ic</sub> )			
		5.13.1 Test sample			
		5.13.2 Test pieces test method			
	5.14	6 6			
		5.14.1 Test sample rail			
		5.14.2 Test pieces			
		5.14.3 Test method			
	5.15	Fatigue test			
	5.15	5.15.1 Test sample rail			
		5.15.2 Test pieces			
		5.15.3 Test method			
		5.15.4 Number of tests and test conditions			
	5.16	Variation of centre line running surface hardness of heat-treated rails	8		
6	Tolerances for dimension, shape, length and weight				
	6.1	Dimension, shape and length tolerance			
	6.2	Straightness, surface flatness and twist			
	6.3	Weight	9		
7	Tech	nical requirements	14		
	7.1	Manufacturing methods			
	7.2	Chemical composition			
	7.3	Mechanical properties			
	7.4	Microstructure	17		

## ISO 5003:2016(E)

This is a preview of "ISO 5003:2016". Click here to purchase the full version from the ANSI store.

	7.5	Decarburization	17	
	7.6	Non-metallic inclusions		
	7.7	Macrostructure		
	7.8	Ultrasonic test		
	7.9	Surface quality		
	7.10	Residual stress		
	7.11	Fracture toughness		
	7.12	Fatigue crack growth rate		
	7.13	Fatigue test	20	
8	Inspection requirements			
	8.1	Inspection and acceptance	20	
	8.2	Retest and justification		
9	Identi	fication	21	
,	9.1	Branding		
	9.2	Hot stamping		
	9.3	Cold stamping		
	9.4	Other identification		
10	Certifi	cation	22	
11	Qualit	y assurance system	22	
Annex A (normative) Steel grades				
Annex		mative) Method for determination of tensile strength and elongation for as-	~	
	rolled	rails by a correlation	35	
Annex		mative) Microscopic examination of rail steels using standard diagrams to the content of non-metallic inclusions	37	
Annex	<b>D</b> (info	ormative) <b>Rail profile</b>	42	
		mative) Method for the determination of rail foot surface longitudinal		
Timica		al stresses	43	
Annex	<b>F</b> (nor	mative) Standard test method for the determination of the plane strain		
	fractu	re toughness (K <sub>Ic</sub> ) of rails	46	
Annex	<b>G</b> (nor	mative) <b>Profile and drilling gauges</b>	51	
Annex		mative) Standard diagrams for the check of the macrostructure of rails in lance with ISO 4969	63	
Annex		native) Limiting sulfur prints		
	Pibliography			

This is a preview of "ISO 5003:2016". Click here to purchase the full version from the ANSI store.

### Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see <a href="www.iso.org/directives">www.iso.org/directives</a>).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see <a href="https://www.iso.org/patents">www.iso.org/patents</a>).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: Foreword — Supplementary information.

The committee responsible for this document is ISO/TC 17, *Steel*, Subcommittee SC 15, *Railway rails, rail fasteners, wheels and wheelsets*.

This second edition cancels and replaces the first edition (ISO 5003:1980), which has been technically revised.