

JAPANESE INDUSTRIAL STANDARD

Translated and Published by Japanese Standards Association

 $JIS \ G \ 5503$: 2024

(JFSinc/JSA)

Austempered spheroidal graphite cast irons

ICS 77.080.10;77.140.80

Reference number: JIS G 5503: 2024 (E)

G 5503: 2024

Date of Establishment: 1989-03-01

Date of Revision: 2024-03-21

Date of Public Notice in Official Gazette: 2024-03-21

Investigated by: Japanese Industrial Standards Committee

Standards Board for ISO area

Technical Committee on Metal and Inorganic Materials

JIS G 5503: 2024, First English edition published in 2024-11

Translated and published by: Japanese Standards Association Mita Avanti, 3-11-28, Mita, Minato-ku, Tokyo, 108-0073 JAPAN

In the event of any doubts arising as to the contents, the original JIS is to be the final authority.

© JSA 2024

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

Printed in Japan HN

Contents

	Page
Intro	duction1
1	Scope
$\overline{2}$	Normative references · · · · · · · · · · · · · · · · · · ·
3	Terms and definitions ·······2
4	Designation ·····5
5	Order information ····· 5
6	Manufacturing method · · · · · 5
7	Requirements ······6
7.1	General ·····6
7.2	Tensile properties
7.3	Impact properties
7.4	Chemical composition · · · · · 8 Hardness · · · · · · 8
7.5	
7.6	Graphite particle form and matrix structure ···········8 Specific mechanical properties ········9
7.7	Physical properties 9
7.8 7.9	Internal soundness9
7.10	Shape, dimensions, dimensional tolerances, machining allowances,
7.10	draft angle and mass ······9
7.11	Appearance9
8	Test units and number of tests ······9
8.1	Test units9
8.2	Number of tests ·······10
9	Samples
9.1 9.2	Sampling
9.3	Type of cast samples in relation to relevant wall thickness ······16
10	Austempering
10.1	General ·······17
10.1	Austempering on cast samples ·······17
10.2	Austempering on east samples Austempering on samples cut from a casting
11	Test pieces and samples
11.1	Preparation method of test pieces
11.1	Shape and dimensions of test pieces and samples18
11.2	Number of test pieces and samples
• -	10

G 5503:2024

12	Tests ·····	_
12.1	Tensile test ·····	
12.2	Impact test ·····	
12.3	Chemical analysis · · · · · · · · · · · · · · · · · ·	
12.4	Hardness test	
12.5	Graphite particle form test and matrix structure test	
12.6	Specific mechanical property test	
$12.7 \\ 12.8$	Internal soundness test	
12.9	Appearance test	
	Retests ·····	
13 13.1	Need for retests	
13.2	Invalid test conditions	
13.3	Retests for the invalid cast iron tests	
14 14.1	Reaustempering of nonconforming cast irons	· 23
$14.1 \\ 14.2$	Reaustempering of cast irons ······	_
14.3	Retests of reaustempered cast irons	
15	Inspections	
16	Marking ·····	
17	Report ·····	·24
Annex	x A (normative) Abrasion-resistant ausferritic spheroidal graphite cast	
	irons	·25
Annex	x B (Requirements of the corresponding International Standard are de-	~ -
	leted in this Standard) · · · · · · · · · · · · · · · · · · ·	
	x C (informative) Guidance values for hardness	
Annex	x D (informative) Hardness range ······	· 29
Annex	E (informative) Tensile properties of test pieces cut from a casting [4]	.30
Annex	x F (informative) Unnotched impact test ······	·31
Annex	x G (informative) Additional information on mechanical and physical properties	. 33
Annex	x H (normative) Measurement of graphite nodularity (ISO method)	· 36
Annex	x I (informative) Sectioning procedure for cast test pieces ······	• 40
Annex	x J (informative) Cross-references of designations of ausferritic spheroidal graphite cast iron among this Standard, the ISO standard and other international standards	· 41
Annex	x JA (normative) Measurement of graphite nodularity of cast irons by image analysis (JIS method)	

Bibliography	45
Annex JB (informative)	Comparison table between JIS and corresponding
	International Standard ·······46

G 5503: 2024

Foreword

This Japanese Industrial Standard has been revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Foundry Society, Inc. (JFSinc)/Japanese Standards Association (JSA) with a draft being attached, based on the provision of Article 12, paragraph (1) of the Industrial Standardization Act applied mutatis mutandis pursuant to the provision of Article 16 of the said Act. This edition replaces the previous edition (JIS G 5503: 1995), which has been technically revised.

This **JIS** document is protected by the Copyright Act.

Attention is drawn to the possibility that some parts of this Standard may conflict with patent rights, published patent application or utility model rights. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying any of such patent rights, published patent application or utility model rights.

Austempered spheroidal graphite cast irons

JIS G 5503: 2024

Introduction

This Japanese Industrial Standard has been prepared based on **ISO 17804**: 2020, Edition 2, with some modifications of the technical contents.

Annex JA is unique to **JIS** and not given in the corresponding International Standard. The vertical lines on both sides and dotted underlines indicate changes from the corresponding International Standard. A list of modifications with the explanations is given in Annex JB.

1 Scope

This Standard specifies the requirements for ausferritic spheroidal graphite cast irons (hereafter referred to as cast irons).

NOTE The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows.

ISO 17804: 2020 Founding — Ausferritic spheroidal graphite cast irons — Classification (MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21-1**.

2 Normative references

Part or all of the provisions of the following standards, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

- JIS B 0403 Castings System of dimensional tolerances and machining allowances
- JIS G 0201 Glossary of terms used in iron and steel (Heat treatment)
- JIS G 0320 Standard test method for heat analysis of steel products
- JIS G 1253 Iron and steel Method for spark discharge atomic emission spectrometric analysis
- JIS G 5502 Spheroidal graphite cast irons
- JIS Z 2241 Metallic materials Tensile testing Method of test at room temperature
- NOTE Normative reference in the corresponding International Standard:ISO 6892-1 Metallic materials Tensile testing Part 1: Method of test at room temperature