

JIS

JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS B 1054-1 : 2013

(ISO 3506-1 : 2009)

(JFRI/JSA)

**Mechanical properties of corrosion-resistant stainless steel fasteners—
Part 1: Bolts, screws and studs**

ICS 21.060.10

Reference number : **JIS B 1054-1 : 2013 (E)**

B 1054-1 : 2013 (ISO 3506-1 : 2009)

Date of Establishment: 2001-01-20

Date of Revision: 2013-05-20

Date of Public Notice in Official Gazette: 2013-05-20

Investigated by: Japanese Industrial Standards Committee
Standards Board

Technical Committee on Machine Elements

JIS B 1054-1:2013, First English edition published in 2013-09

Translated and published by: Japanese Standards Association
4-1-24, Akasaka, Minato-ku, Tokyo, 107-8440 JAPAN

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

© JSA 2013

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

AT

PROTECTED BY COPYRIGHT

Contents

	Page
Introduction.....	1
1 Scope.....	1
2 Normative references	2
3 Symbols	3
4 Designation, marking and finish	4
4.1 Designation.....	4
4.2 Marking.....	5
4.3 Finish	7
5 Chemical composition	7
6 Mechanical properties.....	9
7 Testing	11
7.1 Test programme.....	11
7.2 Test methods.....	11
Annex A (normative) External thread—Calculation of stress area	16
Annex B (informative) Description of the groups and grades of stainless steels.....	17
Annex C (informative) Stainless steel composition specifications (Extract from ISO 683-13:1986)	20
Annex D (informative) Stainless steels for cold heading and extruding (Extract from ISO 4954:1993).....	23
Annex E (informative) Austenitic stainless steels with particular resistance to chloride induced stress corrosion (Extract from EN 10088-1:2005)	25
Annex F (informative) Mechanical properties at elevated temperatures; application at low temperatures	26
Annex G (informative) Time-temperature diagram of intergranular corrosion in austenitic stainless steels, grade A2 (18/8 steels)	28
Annex H (informative) Magnetic properties for austenitic stainless steels	29
Annex JA (informative) Stainless steel grades and chemical composition (comparison table between JIS and ISO Standards)	30

Foreword

This translation has been made based on the original Japanese Industrial Standard 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 The Japan Research Institute for Screw Threads and Fasteners (JFRI)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently, **JIS B 1054-1**:2001 is replaced with this Standard.

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

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

JIS B 1054 series consists of the following 4 parts under the general title “*Mechanical properties of corrosion-resistant stainless-steel fasteners*”:

Part 1: Bolts, screws and studs

Part 2: Nuts

Part 3: Set screws and similar fasteners not under tensile stress

Part 4: Tapping screws

Mechanical properties of corrosion-resistant stainless steel fasteners— Part 1: Bolts, screws and studs

Introduction

This Japanese Industrial Standard has been prepared based on the second edition of **ISO 3506-1** published in 2009 without any modifications of the technical contents.

Annex JA in this Standard is not contained in the corresponding International Standard.

1 Scope

This Standard specifies the mechanical properties of bolts, screws and studs made of austenitic, martensitic and ferritic steel grades of corrosion-resistant stainless steels, when tested over an ambient temperature range of 10 °C to 35 °C. Properties vary at higher or lower temperatures.

This Standard applies to bolts, screws and studs

- with nominal thread diameter $d \leq 39$ mm,
- of **ISO** general purpose metric threads based on **JIS B 0205-1** with diameters and pitches in accordance with **JIS B 0205-2** and **JIS B 0205-3**, and
- of any shape.

It does not apply to bolts, screws and studs with special properties, such as weldability.

NOTE : The designation system of this Standard can be used for sizes outside the limits given in this clause (e.g. $d > 39$ mm), provided that all applicable mechanical and physical requirements of the property classes are met.

This Standard does not define corrosion or oxidation resistance in particular environments. However, some information on materials for particular environments is given in Annex E. Regarding definitions of corrosion and corrosion resistance, see **ISO 8044**.

The aim of this Standard is the classification of corrosion-resistant stainless steel fasteners¹⁾ into property classes. Some materials can be used at temperatures down to -200 °C, while some can be used at temperatures up to +800 °C in air. Information on the influence of temperature on mechanical properties is found in Annex F.

Note ¹⁾ The term “fasteners” is used when bolts, screws and studs are considered all together.

Corrosion and oxidation performances and mechanical properties for use at elevated or sub-zero temperatures can be agreed on between the user and the manufacturer in each particular case. Annex G shows how the risk of intergranular corrosion at elevated temperatures depends on the carbon content.

All austenitic stainless steel fasteners are normally non-magnetic in the annealed condition; after cold working, some magnetic properties can be evident (see Annex H).