Doc. No. MTD16(25873)WC
June 2024

भारतीय मानक ब्यूरो

भारतीय मानक **प्रारूप**

उष्मा-उपचारित इस्पात, मिश्रधातु एवं सकटय इस्पात — बॉल एवं रोलर बेयरिंग इस्पात

(पहला पुनरीक्षण)

Draft *Indian Standard*

HEAT-TREATABLE STEELS, ALLOY STEELS AND FREE-CUTTING STEELS —BALL AND ROLLER BEARING STEELS

(First Revision)

21.100.20; 77.140.10

Alloy steel and Forging Sectional committee, MTD 16

Last date for receipt of comments: 19/07/2024

NATIONAL FOREWORD

This draft standard is identical to ISO 683 : 2023 ‘Heat-treatable steels, alloy steels and free-cutting steels Part 17: Ball and roller bearing steels’ issued by the International Organization for Standardization (ISO), and subject to its finalization is to be adopted by the Bureau of Indian Standards on the recommendation of the Alloy steel and Forging Sectional committee, MTD 16 and approval of the Metallurgical Engineering Division Council

This standard has been undertaken to align with the latest version of ISO 683 : 2023 to harmonize it with the latest developments that have taken place at international level.

This fourth edition cancels and replaces the third edition (ISO 683-17:2014), which has been technically revised.

The main changes are as follows:

a) Induction hardening steel 50CrMo4 and stainless steel X30CrMoN15-1 were added;
b) Requirements for Ca and Ti content have been added for through-hardening bearing steels;
c) Requirements for O content have been further restricted for through-hardening and induction
d) hardening bearing steels;
e) Option for H content for premium bearing steels has been added for through-hardening, case
f) hardening and induction-hardening bearing steels;
g) Option for verification of microscopic inclusions in Table A.1 for through-hardening bearing steels has been revised

The text of ISO standard has been approved as suitable for publication as in Indian Standard without deviations. Certain terminologies and conventions are, however, not identical with those used in Indian Standard. Attention is especially drawn to the following:

a) Wherever the words `International Standard’ appear referring to this standard, it should be read as `Indian Standard’

b) Comma (,) has been used as a decimal marker while in Indian Standards the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exists. The corresponding Indian Standards which are to be substituted in their place are listed below along with their degree of equivalence for the edition indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 377 : 2020 Steel and steel products — Location and preparation of samples and test pieces for mechanical testing	IS 3711 : 2020 Steel and Steel Products — Location and Preparation of Samples and Test Pieces for Mechanical Testing (Third Revision)	Identical under dual numbering
ISO 404:2013 General technical delivery requirements for steel and steel products	IS 8910 : 2022 General technical delivery requirements for steel and steel products	Identical under dual numbering
ISO 642:1999 Steel — Hardenability test by end quenching (Jominy test)	IS 3848 : 2024 Steel — Hardenability Test by End Quenching (Jominy Test) (Second Revision)	Identical under dual numbering
ISO 643:2012 Steels — Micrographic determination of the apparent grain size	IS 4748 : 2021 Steel - Micrographic determination of the apparent grain size (Third Revision)	Identical under dual numbering
ISO 3763:1976 Wrought steels — Macroscopic methods for assessing the content of non-metallic inclusions	IS 10138 : 2010 Macroscopic methods for determination of non-metallic inclusion content in wrought steels (Second Revision)	Not Equivalent
ISO 3887:2023 Steels — Determination of the depth of decarburization	IS 6396 : 2000 Methods of measuring decarbunzed depth of steel (Second Revision)	Not Equivalent
ISO 4948-1 : 1982 Steels — Classification — Part 1: Classification of steels into unalloyed and alloy steels based on chemical composition	IS 7598 : 1990 Classification of steels (First Revision)	Not Equivalent
ISO 4948-2:1981 Steels — Classification Part 2: Classification of unalloyed and alloy steels according to main quality classes and main property or application characteristics	IS 7598 : 1990 Classification of steels (First Revision)	Not Equivalent
ISO 4967:2013 Steel — Determination of content of non-metallic inclusions — Micrographic method using standard diagrams	IS 4163 : 2021 Steel - Determination of content of non-metallic inclusions - Micrographic method using	Identical under dual numbering

	standard diagrams (Fourth Revision)	
ISO 5949 : 1983 Tool steels and bearing steels — Micrographic method for assessing the distribution of carbides using reference photomicrographs	IS 12211 : 1987 Specification for micrographic method for assessing the distribution of carbides in tool steels and bearing steels using reference photomicrographs	Not Equivalent
ISO 6506-1 : 2014 Metallic materials — Brinell hardness test — Part 1: Test method	IS 1500 (Part 1) : 2019 Metallic materials - Brinell hardness test: Part 1 test method (Fifth Revision)	Identical under dual numbering
ISO 6508-1 : 2016 Metallic materials — Rockwell hardness test — Part 1: Test method	IS 1586 (Part 1) : 2018 Metallic materials - Rockwell hardness test: Part 1 test method (Fifth Revision)	Identical under dual numbering
ISO 10474 : 2013 Steel and steel products — Inspection documents.	IS/ISO 10474 : 2013 Steel and steel products — Inspection documents	Identical under single numbering
ISO 14284 : 1996 Steel and iron — Sampling and preparation of samples for the determination of chemical composition	IS/ISO 14284 : 1996 Steel and iron - Sampling and preparation of samples for the determination of chemical composition	Identical under single numbering

The technical committee has reviewed the provisions of the following International Standard, referred in this adopted standard and has decided that it is acceptable for use in conjunction with this standard:

International Standard	*Title*
ISO 4885 : 2018	Ferrous materials — Heat treatments — Vocabulary
ISO 4969 : 2015	Steel — Etching method for macroscopic examination
ISO 6929 : 2013	Steel products — Vocabulary
ISO 9443 : 2018	Surface quality classes for hot-rolled bars and wire rod
ISO 23825:2020	Method for evaluating the nodularity of spheroidal carbides — Steels for cold heading and cold extruding
ASTM A892,	Standard Guide for Defining and Rating the Microstructure of High Carbon Bearing Steels
JIS G0555,	Microscopic testing method for the non-metallic inclusions in steel
SEP 1520,	Microscopic examination of carbide structure in steels by means of diagram series

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

The Scope of the standard is as follows:

SCOPE

This document specifies the technical delivery requirements for five groups of wrought ball and roller bearing steels as listed in Table 3, namely

— through-hardening bearing steels (steels with about 1 % C and 1 % to 2 % Cr),
— case-hardening bearing steels,
— induction-hardening bearing steels (unalloyed and alloyed),
— stainless bearing steels, and
— High-temperature bearing steels.

This document is applicable to the products and heat-treatment conditions given in Table 1 and the surface conditions given in Table 2

The complete document/text of ISO 683-17 : 2023 'Heat-Treatable Steels, Alloy Steels and Free-Cutting Steels — Part 17: Ball and Roller Bearing Steels' may be made available, on request to:

संजीव मैनी /**Sanjiv Maini**
वरिष्ठ निदेशक, वैज्ञानिक 'एफ' एवं प्रमुख /**Senior Director, Scientist 'F' & Head**
धातुकर्म अभियांत्रिकी विभाग /**Metallurgical Engg. Department**
भारतीय मानक ब्यूरो /**Bureau of Indian Standards,**
मानक भवन, नई दिल्ली/ **Manak Bhavan, 9, B.S.Z. Marg,**
New Delhi-110002
E-mail: mtd@bis.gov.in, mtd25@bis.gov.in
Tel: + 91 11 23231085