INTERNATIONAL STANDARD

**ISO 13583-1**

Third edition
2023-02

# Centrifugally cast steel and alloy products —

## Part 1: General testing and tolerances

*Produits en acier et alliages moulés par centrifugation —*

*Partie 1: Conditions générales d'essais et tolérances*

Reference number
ISO 13583-1:2023(E)

© ISO 2023



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2023

All rights reserved. Unless otherwise specified, or required in the context of its implementation, 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
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland



© ISO 2023 – All rights reserved

# Contents

Page

**Foreword** ..... **iv**
**1 Scope** ..... **1**
**2 Normative references** ..... **1**
**3 Terms and definitions** ..... **1**
**4 Materials** ..... **3**
**5 Supply** ..... **3**
**6 Mechanical tests** ..... **3**
**7 Surface finish requirements** ..... **3**
**8 Minimum sound wall (MSW) thickness and soundness** ..... **4**
**9 Dimensional and shape tolerances** ..... **4**
9.1 General ..... 4
9.2 Length ..... 4
9.3 Straightness ..... 4
9.4 Outside and inside diameters ..... 5
**10 Inspection procedures and standards of acceptance** ..... **6**
**11 Production welding** ..... **6**
**12 Supplementary requirements** ..... **6**
12.1 General ..... 6
12.2 Pressure test ..... 6
12.3 Elevated temperature test ..... 6
12.4 Acid etch ring test ..... 6
12.5 Magnetic particle test ..... 7
12.6 Ferrite determination ..... 7
12.7 Corrosion testing ..... 7
12.8 Eddy current testing ..... 7
12.9 Radiography ..... 7
12.10 Ultrasonic testing ..... 7

© ISO 2023 – All rights reserved

# 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 www.iso.org/directives).

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 www.iso.org/patents).

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

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 17, *Steel*, Subcommittee SC 11, *Steel castings*.

This third edition cancels and replaces the second edition (ISO 13583-1:2015), of which it constitutes a minor revision. The changes are as follows:

— updated titles to normative references;

— editorial update.

A list of all parts in the ISO 13583 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.


© ISO 2023 – All rights reserved

# Centrifugally cast steel and alloy products —

# Part 1:
# General testing and tolerances

## 1 Scope

This document specifies the requirements for horizontal and vertical centrifugally cast steel and alloy products to be used in the following applications:

a) heat resisting;

b) corrosion resisting;

c) general engineering.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3651-1, *Determination of resistance to intergranular corrosion of stainless steels — Part 1: Austenitic and ferritic-austenitic (duplex) stainless steels — Corrosion test in nitric acid medium by measurement of loss in mass (Huey test)*

ISO 3651-2, *Determination of resistance to intergranular corrosion of stainless steels — Part 2: Ferritic,austenitic and ferritic-austenitic (duplex) stainless steels — Corrosion test in media containing sulfuric acid*

ISO 4986, *Steel and iron castings — Magnetic particle testing*

ISO 4987, *Steel and iron castings — Liquid penetrant testing*

ISO 4990, *Steel castings — General technical delivery requirements*

ISO 4992-1, *Steel castings — Ultrasonic testing — Part 1: Steel castings for general purposes*

ISO 4992-2, *Steel castings — Ultrasonic testing — Part 2: Steel castings for highly stressed components*

ISO 4993, *Steel castings — Radiographic testing*

ISO 6892-1, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature*

ISO 6892-2, *Metallic materials — Tensile testing — Part 2: Method of test at elevated temperature*

ISO 13520, *Determination of ferrite content in austenitic stainless steel castings*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

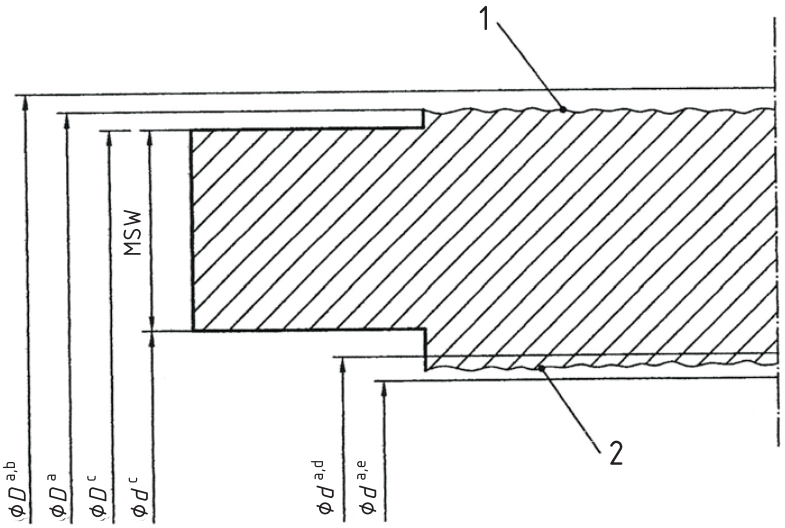
— ISO Online browsing platform: available at https://www.iso.org/obp

© ISO 2023 – All rights reserved

— IEC Electropedia: available at https://www.electropedia.org/

**3.1**
**minimum sound wall thickness**
**MSW**
thickness that remains when all the porosity and roughness associated with the internal and external cast surfaces have been removed by machining

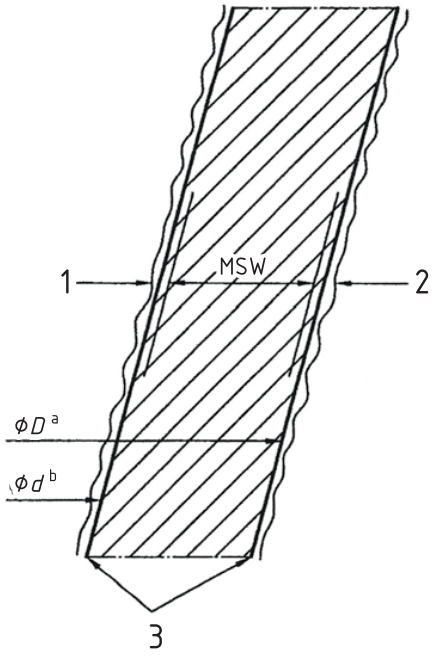
Note 1 to entry: See Figures 1 and 2.




**Key**
1 outside roughness
2 inside porosity
*D* outside diameter
*d* inside diameter
a As-cast.
b + tolerance.
c Machined.
d + porosity.
e – tolerance.

**Figure 1 — Horizontal centrifugally cast tube**


© ISO 2023 – All rights reserved




**Key**

1 inside porosity
2 outside roughness
3 unmachined surfaces with MSW and additions resulting from tolerances on diameters
[a] Machined + tolerance.
[b] Machined – tolerance.

**Figure 2 — Vertical centrifugally cast tube**

## 4 Materials

Materials shall be specified by the purchaser.

## 5 Supply

The product shall conform with the requirements of ISO 4990.

## 6 Mechanical tests

**6.1** Test pieces for mechanical tests shall be taken either from the centrifugally cast product or from separately cast samples from the same melt as the casting and heat treated under the same conditions as the casting they represent. The tensile test shall be carried out in accordance with ISO 6892-1.

Separately cast samples are acceptable only if agreed between purchaser and manufacturer.

**6.2** Upon agreement, the tensile test at room temperature may be substituted by an elevated temperature tensile test, a stress to rupture test or a creep test, (see 12.3). The elevated temperature tensile test shall be carried out in accordance with ISO 6892-2.

## 7 Surface finish requirements

The surface finish shall be agreed between purchaser and manufacturer.

© ISO 2023 – All rights reserved