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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 7233.1-2023

**Steel castings - Ultrasonic testing - Part 1: Steel castings for
general purposes**

铸钢件 超声检测 第1部分：一般用途铸钢件

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Table of Contents

Foreword	3
Introduction	5
1 Scope	6
2 Normative References	6
3 Terms and Definitions	7
4 General Requirements	8
5 Testing Method	13
Appendix A (Informative) Structural Changes between this Document and ISO 4992-1.2020	23
Appendix B (Informative) Technical Differences and Their Causes between This Document and ISO 4992-1.2020	25
Appendix C (Informative) Diameter of Sound Beam	28
Appendix D (Informative) Display Type Generated by Typical Defects	30

Foreword

This document was issued on 17 March 2023 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 1 October 2023.

It is a GB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

1 Scope

GB/T 7233.1-2023 is the part of the series that governs ultrasonic testing of steel castings for general purposes. Clause 4 sets the general requirements: choosing a technique that reaches every area to be inspected where the shape of the casting allows, and dividing the casting into inner and outer layers according to the size it has once assembled or finished, since depth changes what a probe can resolve. Clause 5 covers the testing method, including the couplant, which complies with GB/T 39240 and stays the same through verification and subsequent testing, and the check on coupling made with bottom echoes parallel to the back wall. The terminology of clause 3 builds on GB/T 12604.1, GB/T 39240, GB/T 39242 and GB/T 39292, and separates discontinuities having two measurable dimensions from the rest. Informative annexes give the diameter of the sound beam, the display types produced by typical defects, and the differences from ISO 4992-1:2020. Steel solidifies with shrinkage cavities, porosity and cracks that leave nothing visible on the

surface, and a foundry and its customer reach the same verdict only when the coupling, the technique and the reading of an indication are fixed in advance. Used by steel foundries, non-destructive testing laboratories and the inspection bodies that accept castings.

This Document specifies the general requirements and testing methods for ultrasonic testing of

steel castings for general purposes.

This Document applies to the ultrasonic testing of general-purposed steel castings having a grain refining heat treatment and a wall thickness not exceeding 600 mm. For steel castings with a wall thickness greater than 600mm, if there is no special requirement, refer to it.

2 Normative References

The provisions in following documents become the essential provisions of this Document through reference in this Document. For the dated documents, only the versions with the dates

indicated are applicable to this Document; for the undated documents, only the latest version

(including all the amendments) is applicable to this Document.

GB/T 9445 Non-destructive testing - Qualification and certification of NDT personnel
(GB/T 9445-2015, ISO 9712:2012, IDT)

GB/T 12604.1 Non-destructive testing - Terminology - Ultrasonic testing (GB/T 12604.1-2020, ISO 5577:2017, MOD)

3 Terms and Definitions

For the purposes of this Document, the terms and definitions given in GB/T 12604.1, GB/T 39240, GB/T 39242, GB/T 39292 and the following apply.

A defect with two-dimensional measurable dimension.

Welding to ensure that steel castings meet their required quality.

4 General Requirements

The most appropriate testing method shall be used to detect all inspected areas of the steel castings (if the shape of the steel castings allows).

According to the size of steel castings to be assembled (finishing), it is divided into inner

layer

and outer layer, and the wall thickness division is shown in Figure 2.

5 Testing Method

The couplant that complies with GB/T 39240 shall be used; and the same couplant shall be used

in the verification and subsequent testing. The coupling effect is checked using one or more bottom waves parallel to the bottom.

For the recorded defective area (see 5.5.5), it shall be further verified the type, shape, size, and

location.

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Appendix A for a list of changes in structure number between the two documents.

Compared with ISO 4992-1:2020, this document has many technical differences, and the outer

margins of the terms involved are marked with a vertical single line (|). See Appendix B for a

list of these technical differences and their causes.

This Document made the following editorial modifications.

--- 3.6, delete NOTE of 3.8 in ISO 4992-1;

--- Delete the bibliography.

Please note some contents of this Document may involve patents. The issuing agency of this

Document shall not assume the responsibility to identify these patents.

This Document was proposed by and under the jurisdiction of National Technical Committee

on Castings of Standardization Administration of China (SAC/TC 54).

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The historical editions replaced by this Document are as follows.

--- GB/T 7233 was first-time published in 1987;

--- GB/T 7233.1 was first-time published in 2009;

--- It is first-time revised hereby.