

ICS 77.040.20
CCS J31



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

GB/T 7233.2-2023

**Steel castings - Ultrasonic testing - Part 2: Steel castings for
highly stressed components**

铸钢件 超声检测 第2部分：高承压铸钢件

Issued on: May 23, 2023

Implemented on: December 1, 2023

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

Table of Contents

1 Scope	1
2 Normative references	1
3 Terms and Definitions	1
4 General requirements	2
23 Reference	35

Foreword

This document is in accordance with the provisions of GB/T 1:1-2020 "Guidelines for Standardization Work Part 1: Structure and Drafting Rules for Standardization Documents" drafting: This document is the second part of GB/T 7233 "Ultrasonic Testing of Steel Castings": GB/T 7233 has issued the following parts:

--- Part 1: General purpose steel castings;

--- Part 2: High pressure steel castings: This document replaces GB/T 7233:2-2010 "Ultrasonic Testing of Steel Castings Part 2: High Pressure Steel Castings", and Compared with GB/T 7233:2-2010, in addition to structural adjustments and editorial changes, the main technical content changes are as follows:

- a) Changed the material in the scope of application of the standard (see Chapter 1, Chapter 1 of the:2010 edition);
- b) Added some terms and definitions (see 3:5, 3:7);
- c) Increase the maximum allowable limit of defects (see 4:3:3:1~4:3:3:3);
- d) Changed the general principles of testing and the standards cited by equipment (see 5:1, 5:3:1~5:3:3, 5:1, 5:3:1~ of the:2010 edition 5:3:3);
- e) Added couplant, preparation of casting surface for scanning, range setting, general principle of sensitivity adjustment, transmission correction, defect characteristics Standards cited for general principles of characterization and quantification (see 5:3:4, 5:4, 5:5:2, 5:5:3:1, 5:5:3:2, 5:5:7:1);
- f) Added reference test block (see 5:3:5): This document is modified to adopt ISO 4992-2:2020 "Ultrasonic Testing of Steel Castings Part 2: High Pressure Steel Castings": Compared with ISO 4992-2:2020, this document has more structural adjustments: The structural changes between the two documents are listed in the appendix Record A: Compared with ISO 4992-2:2020, this document has more technical differences, and

vertical A single line (I) is marked: See Appendix B for a list of these technical differences and their causes: The following editorial changes were made to this document:

--- 3:6, delete the note of 3:8 in ISO 4992-2;

--- Removed references: Please note that some contents of this document may refer to patents: The issuing agency of this document assumes no responsibility for identifying patents: This document is proposed and managed by the National Foundry Standardization Technical Committee (SAC/TC54): This document is drafted by: Shenyang Foundry Research Institute Co., Ltd.; Anhui Yingliu Group Huoshan Foundry Co., Ltd.; Harbin Jiuzhou Group Co., Ltd.; Co., Ltd.; Steel Research Nanoco Testing Technology Co., Ltd.; Zhejiang Dalong Special Materials Co., Ltd.; China Railway Baoqiao Group Co., Ltd.; Lanzhou Lanzhou Stone Heavy Equipment Co., Ltd.; Tongyu Heavy Industry Co., Ltd.; Sanming Yijun Machinery Casting Co., Ltd.; Jiangxi Fuling Casting Co., Ltd. Company, Jinyun County Creer Testing Equipment Co., Ltd.; Xiangyang Jinnaite Machinery Co., Ltd.; Qingdao Changhui Pipe Industry Co., Ltd.; Shandong Zhen Tingjinggong Piston Co., Ltd.; Shandong Automobile Manufacturing Co., Ltd.; Yantai Standard Metrology Inspection and Testing Center, Erzhong (Deyang) Heavy Equipment Co., Ltd.; Co., Ltd.; Harbin Electric Machinery Co., Ltd.; CITIC Heavy Industry Machinery Co., Ltd.; CRRC Changchun Railway Vehicle Co., Ltd.; China Cheqihar Vehicle Co., Ltd.; North Heavy Industry Group Co., Ltd.: The main drafters of this document: Li Xingjie, Xu Xu, Guo Zongshan, Sun Chungui, Zhang Zhen, Hou Chunyu, Du Yingliu, Wang Lihua, Zhang Jianwei, Ren Qing, Song Quanzhi, Wang Hanchao, Ma Zhengqiang, Wang Qingyu, Jia Guanfei, Shen Haihong, Xu Wenda, Wang Kai, Lu Qifeng, Chen Tao, Tian Meng, Cheng Shishu, Zhang Yiru, Liu Yi, Wang Engang, Wu Fangming, Du Ming, Zhang Zhouxu, Shuai Dejun, Huang Liankai, Liu Yuanyi, Zu Yuwei, Pang Wenhua, Hu Zhonghua, Xu Lei, Qi Yinghao, Cui Lanfang, Liu Yuchang, Zhang Wen, Xie Jingtian, An Yang: The previous versions of the documents replaced by this document are as follows:

---GB/T 7233, first released in 1987;

---GB/T 7233:2, first released in:2010;

--- This is the first revision:

1 Scope

GB/T 7233.2-2023 is Part 2 of the Chinese series on ultrasonic testing of steel castings, and covers castings for highly stressed components. A casting is a difficult object for ultrasonics: the grain is coarse and variable, the surface is as-cast, and the section thickness changes across the part, so the same instrument settings that find a defect in one region are blind in another. Yet these are the parts - valve bodies, turbine casings, structural nodes - whose failure is not recoverable, so the examination has to be specified rather than left to the operator. The standard sets the general requirements and the detection method,

with a normative annex on the resolution of the instrument and probe combination and informative annexes on the sound beam diameter and on the types of indication that typical defects produce. It took effect on 1 December 2023.

This document specifies the general requirements and testing methods for ultrasonic testing of high pressure steel castings: This document applies to ultrasonic testing of high pressure steel castings that have undergone grain refinement heat treatment and whose wall thickness does not exceed 600mm: for wall thickness For steel castings larger than 600mm, if there is no special requirement, it can be implemented by reference: This document does not apply to austenitic and austenitic-ferritic duplex stainless steels: Martensitic stainless steels may be implemented as a reference:

2 Normative references

The contents of the following documents constitute the essential provisions of this document through normative references in the text: Among them, dated references For documents, only the version corresponding to the date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to this document:

GB/T 9445 Qualification and certification of non-destructive testing personnel (GB/T 9445-2015, ISO 9712:2012, IDT) GB/T 12604:

1 Nondestructive Testing Terminology Ultrasonic Testing (GB/T 12064:1-2020, ISO 5577:2017, MOD) GB/T 19799:

1 Nondestructive Testing Ultrasonic Testing No:

1 Calibration Test Block (GB/T 19799:1-2015, ISO 2400:2012, IDT) GB/T 19799:

2 Nondestructive Testing Ultrasonic Testing No:

2 Calibration Test Block (GB/T 19799:2-2012, ISO 7963:2006, IDT) GB/T 27664:

1 Performance and inspection of ultrasonic testing equipment for non-destructive testing - Part 1: Instruments GB/T 27664:

2 Performance and inspection of ultrasonic testing equipment for non-destructive testing - Part 2: Probes GB/T 27664:

3 Performance and inspection of ultrasonic testing equipment for non-destructive testing - Part 3: Combined equipment

GB/T 39239 Characterization and quantification of discontinuities in ultrasonic nondestructive testing (GB/T 39239-2020, ISO 16827: 2012, MOD)

GB/T 39240 General Rules for Nondestructive Testing Ultrasonic Testing (GB/T 39240-2020, ISO 16810:2012, MOD)

GB/T 39242 Ultrasonic testing sensitivity and range setting for non-destructive testing (GB/T 39242-2020, ISO 16811: 2012, MOD)

3 Terms and Definitions

GB/T 12604:1, GB/T 39240, GB/T 39242, GB/T 39239 and the following terms and definitions apply to this document: 3:

1 Point-like defect point-like defect A defect whose size is smaller than or equal to the beam diameter:

Note: The dimensions in this document refer to the size of the defect in the direction of length, width and wall thickness: [Source: GB/T 7233:1-2023,3:1]