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

GB/T 32073.2-2025

Replacing GB/T 38952-2020

**Non-destructive testing - Ultrasonic method for measuring
residual stress - Part 2: Bulk wave method**

无损检测 测量残余应力的超声检测方法 第2部分：体波法

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1 Scope

GB/T 32073.2-2025 is the Chinese national standard covering residual stress measured through the thickness rather than at the surface - the bulk wave gives an average through the section, which is what matters for a weld or a thick forging. It replaces GB/T 38952-2020, folding it into the GB/T 32073 series as Part 2. It was issued on 31 December 2025 and has been in force since 31 December 2025, replacing GB/T 38952-2020. The document is under the responsibility of the Standardization Administration of China. This page is published from the official record of the 2025 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document describes an ultrasonic testing method based on volume wave measurement of residual stress, and specifies the testing system, testing procedures, and temperature compensation for the volume wave method. With correction and testing reports. This document applies to the detection of residual stress in metallic components with a sound transmission rate of not less than 6 dB/m path attenuation. Other non-metallic materials are not specified in the provided text. Follow the instructions.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 228.1 Metallic materials - Tensile testing - Part

3 Terms and Definitions

The terms and definitions defined in GB/T 12604.1 and the following terms and definitions apply to this document.

3.1 bulkwave Ultrasound is composed of both longitudinal and transverse waves.

3.2 bulkwave probe A probe capable of generating body waves (3.1).

4 Testing Overview

4.1 Detection Principle According to the principle of acoustoelasticity, stress in a material that is in the same direction as the propagation of ultrasound will affect its propagation speed; compressive stress accelerates the propagation of ultrasound. Propagation speed. Tensile stress slows down the propagation speed of ultrasonic waves. A component with known stress and identical material, shape, and size to the component being tested is used. Using zero-stress as a reference, the tensile and compressive stress state inside the tested component can be determined by detecting changes in the ultrasonic wave propagation velocity within the component.

8 Test Report 7. References 8

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1. Structure and Drafting Rules of Standardization Documents". Drafting. This document is Part 2 of GB/T 32073 "Nondestructive Testing - Ultrasonic Testing Method for Residual Stress Measurement". GB/T 32073 has been... The following sections were published.

1. Critical Refraction Longitudinal Wave Method;

2. Volume Wave Method. This document replaces GB/T 38952-2020 "Nondestructive Testing - Residual Stress - Ultrasonic Volume Wave Testing Method" and is consistent with GB/T 38952-2020. In comparison, aside from structural adjustments and editorial changes, the main changes are as follows:

a) The scope has been changed (see Chapter 1, Chapter 1 in the 2020 edition);

b) Personnel requirements have been removed (see Chapter 4 in the 2020 edition);

c) The specifications for the tested components have been changed (see 4.2, 5.3 in the 2020 edition);

d) The functional specifications for ultrasonic testing instruments have been changed (see 5.1.1,

6.3 of the 2020 version);

- e) Added regulations for instrument calibration (see 5.1.2);
- f) The probe specifications have been changed (see 5.2, 6.2 in the 2020 edition);
- g) The specifications for the coupling agent have been changed (see 5.3,

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