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

GB/T 38952-2020

**Non-destructive testing--Testing method for measuring residual
stress using bulk wave**

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard is proposed and managed by the National Non-destructive Testing Standardization Technical Committee (SAC/TC56).

This standard was drafted by: Beijing Institute of Technology, Shanghai Institute of Materials, Sinosteel Zhengzhou Metal Products Research Institute Co., Ltd., Sichuan Airlines

Tianchangzheng Equipment Manufacturing Co., Ltd., Inner Mongolia First Machinery Group Co., Ltd., and Xi'an Advanced Stress Inspection and Control Technology Co., Ltd.

1 Scope

This standard specifies the terms and definitions of residual stress ultrasonic body wave testing, personnel requirements, testing points, testing systems, longitudinal and transverse wave acoustics

Requirements for the calibration of elastic coefficients, testing procedures, calibration of testing instruments and the preparation of testing reports.

This standard applies to the use of ultrasonic body waves to detect residual stress in materials.

2 Normative references

The following documents are essential for the application of this document. For dated reference documents, only the dated version applies to this article

Pieces. For the cited documents without date, the latest version (including all amendments)

applies to this document.

GB/T 228.1 Tensile test of metallic materials Part 1. Test method at room temperature

GB/T 7232 Terminology of metal heat treatment process

GB/T 7704 Non-destructive testing X-ray stress determination method

GB/T 9445 Qualification and certification of non-destructive testing personnel

GB/T 12604.1 Terminology for non-destructive testing Ultrasonic testing

GB/T 16923 Normalizing and annealing of steel parts

GB/T 18852 Non-destructive testing, ultrasonic inspection, reference test block and method for measuring the sound beam characteristics of contact probes

GB/T 25712 Vibration aging process parameter selection and effect evaluation method

GB/T 32073 Non-destructive testing residual stress ultrasonic critical refraction longitudinal wave detection method

3 Terms and definitions

The terms and definitions defined in GB/T 7232 and GB/T 12604.1 and the following apply to this document.

3.1

Ultrasound bulk wave

A longitudinal wave with a polarization direction parallel to the propagation direction and a transverse wave with a polarization direction perpendicular to the propagation direction.

3.2

Bulk wave probe bulk wave probe

Probes capable of generating longitudinal and transverse waves.

4 Personnel requirements

Personnel adopting this standard for testing should be qualified and certified in accordance with GB/T 9445 or the system agreed by the parties to the contract, and

Employers or agents carry out job training and operation authorization.

5.1 Detection principle

According to the stress of the acoustic elasticity in the material and the direction of ultrasonic propagation affects its propagation speed, the compression stress accelerates

the ultrasonic propagation speed

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