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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 18852-2020

Replacing GB/T 18852-2002

Non-destructive testing. Ultrasonic testing. Reference blocks and test procedures for the characterization of contact probe sound beams

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Foreword

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

This standard replaces GB/T 18852-2002 "Reference test block and method for non-destructive testing, ultrasonic inspection and measurement of acoustic beam characteristics of contact probes"

Compared with GB/T 18852-2002, the main technical changes are as follows.

---Modified the scope (see Chapter 1, Chapter 1 of the.2002 edition);

---Modified normative reference documents (see Chapter 2, Chapter 2 of the.2002 edition);

---Added terms and definitions (see Chapter 3);

---Modified some symbols and their definitions, deleted the "focus diameter" symbol and its definition, and added the "focus width" symbol and its definition

(See Chapter 4, Chapter 3 of the.2002 edition);

---Modified some abbreviations, modified "FSH", "T", "R", deleted "X, Y, Z", and added "Pi", "SDHi", "Note.

SDH456" (see Chapter 4, Chapter 3 of the.2002 edition);

--- "Sound beam profile and amplitude distribution diagram" is changed to "sound beam characteristic curve" (see Chapter 6, Chapter 5 of the.2002 edition);

--- "Diffraction" is changed to "Interference" (see 6.1.1, 5.1.1 of the.2002 edition).

The translation method used in this standard is equivalent to the ISO 12715.2014 "Non-destructive testing, ultrasonic testing, and measurement of acoustic beam characteristics of contact probes".

Exam blocks and methods.

The Chinese documents that have a consistent correspondence with the international documents cited in this standard are as follows.

---GB/T 12604.1-2020 Non-destructive testing terminology Ultrasonic testing (ISO 5577.2017, IDT)

---GB/T 19799.2-2012 Non-destructive testing Ultrasonic testing No. 2 test block (IS07963.2006, IDT)

This standard was proposed and managed by the National Standardization Technical Committee for Nondestructive Testing (SAC/TC56).

Drafting organizations of this standard. Shanghai Institute of Materials, Changzhou Ultrasonic Electronics Co., Ltd., State Grid Xinjiang Electric Power Co., Ltd. Electric Power Research Institute.

1 Scope

This standard specifies the measurement method of the acoustic beam characteristics of the sound field in the workpiece when the probe is in contact with the workpiece. Probes include straight probes and oblique probes

(Refracted longitudinal wave and refracted transverse wave), focusing probe and double crystal probe. This standard recommends two metal reference test blocks, namely semicircular stepped test blocks

(HS test block) and horizontal hole test block (SDH test block). The diameter or side length of the probe element shall not exceed 25mm.

This standard specifies the measurement guidelines for the acoustic beam characteristics of probes suitable for testing forged steel, rolled steel, aluminum alloy or titanium alloy products. This standard applies

The frequency range of the probe used is 1MHz~15MHz. 1MHz~5MHz is the most suitable frequency range for steel product testing.

5MHz~15MHz is the most suitable frequency range for the detection of fine-grain structure products (such as aluminum alloy products).

If this standard is applied to inspections other than steel products, inspectors should note that the sound speed of the material is different from the sound speed of steel, and at the

same time, the

The nominal refraction angle of the head is usually designed for inspection in steel. This standard gives Snell's law so that inspectors can calculate other isotropic sums

Refraction angle in fine-grained materials. This standard applies to oblique probes, focus probes and dual crystal probes whose actual refraction angle ranges from 0° to 70°.

This standard does not apply to surface wave (Rayleigh) probes.

This standard does not involve the use of flat-bottomed test blocks to evaluate the lack of equivalent dimensions. This standard does not stipulate the acceptance clause, but it is the inspection personnel system

The acceptance clauses for determining the performance of the probe establish a technical basis.

2 Normative references

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

For undated references, the latest version (including all amendments) applies to this document.

ISO 5577 Nondestructive Testing Ultrasonic Testing Terminology

ISO 7963 Nondestructive Testing Ultrasonic Testing No. 2 Test Block

3 Terms and definitions

The terms and definitions defined by ISO 5577 apply to this document.

4.1 Symbols

The symbols listed in Table 1 apply to this document.