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

**GB/T 39239-2020**

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**Non-destructive testing - Ultrasonic testing - Characterization  
and sizing of discontinuities**

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## Foreword

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

This standard uses the redrafting method to modify and adopt ISO 16827.2012 "Characteristics and quantification of discontinuities in ultrasonic testing for non-destructive testing".

The technical differences between this standard and ISO 16827.2012 and the reasons are as follows.

---Regarding normative reference documents, this standard has made adjustments with technical differences to adapt to my country's technical conditions and adjustments

It is concentratedly reflected in Chapter 2 "Normative Reference Documents", and the specific adjustments are as follows.

\* Replace ISO 5577 with GB/T 12604.1 which is equivalent to adopting international standards (see Chapter 2 and Chapter 3);

\* Replace ISO 23279 with GB/T 29711 equivalent to the international standard (see Chapter 2, B.1.1);

\* Replace ISO 16810 (see Chapter 2, 4.1, 5.1) with GB/T 39240 modified to adopt

international standards;

\* Replace ISO 16823 (see Chapter 2, 6.1) with GB/T 39241 modified to adopt international standards;

\* Replace ISO 16811 (see Chapter 2, 5.6, 5.7.1, F.1.1, F.2.1) with GB/T 39242 which is modified to adopt international standards.

--- Added a chapter "Terms and Definitions" (see Chapter 3).

--- Added "Overview", "Quantitative Technology Classification" and "Other Instructions" (see 6.5.1, 6.5.2, 6.5.3).

--- "Roughness  $R_a=6.3\mu\text{m}$ " and " $R_a=12.5\mu\text{m}$ " are modified to "roughness not exceeding  $6.3\mu\text{m}$ " and "roughness not exceeding  $12.5\mu\text{m}$ " (see 4.2).

--- Modified the formula (D.4), the "I, II" in the original international standard formula is not a parameter or variable, but only represents the probe moving direction as shown in Figure 3.

Therefore, it should not appear in the formula. A note has been added after this standard formula (D.4).

This standard has made the following editorial changes.

--- Adjusted the order of Appendix C~Appendix G according to the order in which the text is cited.

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

Drafting organizations of this standard. Shanghai Materials Research Institute, China General Nuclear Power Engineering Co., Ltd., Eintick Testing Technology (Shanghai) Co., Ltd., China

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## 1 Scope

This standard specifies the general principles and techniques for characterizing and quantifying the detected discontinuities to ensure that the discontinuities are assessed according to the applicable acceptance criteria.

This standard applies to the discontinuous characterization and quantification of materials specified in GB/T 39240.

## 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.

GB/T 12604.1 Non-destructive testing term Ultrasonic testing (GB/T 12604.1-2005, ISO 5577.2000, IDT)

GB/T 29711 Non-destructive testing of welds. Ultrasonic testing of welds. Display features (GB/T 29711-2013, ISO 23279.2010, IDT)

GB/T 39240 General rules for nondestructive testing and ultrasonic testing (GB/T 39240-2020, ISO 16810.2012, MOD)

GB/T 39241 Non-destructive testing Ultrasonic testing penetration technology (GB/T 39241-2020, ISO 16823.2012, MOD)

GB/T 39242 Non-destructive testing ultrasonic testing sensitivity and range setting (GB/T 39242-2020, ISO 16811.2012, MOD)

ISO 16828 Non-destructive testing Ultrasonic testing Ultrasonic diffraction acoustic time technology testing and evaluation methods

## 3 Terms and definitions

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

### 4.1 Overview

The characterization of discontinuity refers to the characteristics that need to be determined to evaluate the discontinuity according to the acceptance criteria, including.

- a) Determine the basic parameters of the ultrasonic signal (echo height, ultrasonic propagation time).
- b) Determine the basic shape and orientation.
- c) Take any of the following methods to quantify.
  - 1) Measure one or more dimensions (area/volume), if it cannot be measured due to conditions, follow the method of 2);
  - 2) Measure certain parameters according to the acceptance criteria, such as echo height that can represent discontinuous dimensions.
- d) Positioning, such as the distance from the detection surface or other discontinuities.

- e) Determine other parameters or characteristics required for evaluation.
- f) Feature evaluation, such as cracks or slag inclusions, but it is necessary to fully understand the inspected part and its manufacturing process before effective evaluation.

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