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

GB/T 11345-2023

**Non-destructive testing of welds - Ultrasonic testing -
Techniques, testing levels and assessment**

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Foreword

This document was drafted in accordance with the rules given in GB/T 1.1-2020 "Directives for standardization - Part

1.Rules for the structure and drafting of standardizing documents". This document replaces GB/T 11345-2013 "Non-destructive testing of welds -- Ultrasonic testing -- Techniques, testing levels, and assessment". Compared with GB/T 11345-2013, in addition to the structural adjustments and editorial modifications, the main technical changes in this document are as follows:

- a) Change the scope (see Chapter 1 of this Edition; Chapter 1 of Edition 2013);
- b) Change the terms and definitions (see Chapter 3 of this Edition; Chapter 3 of Edition 2013);
- c) Add symbols (see Chapter 4 of this Edition);
- d) Delete the illustration of probe contact width (see Figure 1 of Edition 2013);
- e) Add the coordinate system for defining the location of discontinuities (see Figure 1 of this Edition);

- f) Change the general (see Chapter 5 of this Edition; Chapter 4 of Edition 2013);
- g) Change the requirements for testing equipment (see 7.2 of this Edition; 6.2 of Edition 2013);
- h) Changed the requirements for probe parameters (see 7.3 of this Edition; 6.3 of Edition 2013);

1 Scope

GB/T 11345-2023 specifies the techniques for manual ultrasonic testing of fusion-welded joints in metallic materials of 8 mm thickness and above, the Chinese equivalent of ISO 17640 and one of the most heavily used weld inspection standards there is. Its central device is the testing level: four levels, A, B, C and D, each corresponding to a different probability of detecting an imperfection, so that a specification can buy the amount of inspection the application actually needs rather than an undefined quantity of it. The document sets the requirements on the equipment and its verification, on the preparation of the surface and the parent material check, on the range and sensitivity setting, on the probe selection and the scanning to be performed at each level, and then on the assessment, which may be based on the length and echo amplitude of the discontinuity or on its characterisation and sizing by probe movement techniques. Level D covers special applications. The 2023 edition takes effect on 1 June 2024.

This document specifies techniques for the manual ultrasonic testing of fusion-welded joints in metallic materials of thickness not less than 8 mm which exhibit low ultrasonic attenuation (especially that due to scatter) at object temperatures from 0°C to 60°C. It is primarily intended for use on full penetration welded joints where both the welded and the parent material are ferritic.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 5577, Non-destructive testing - Ultrasonic testing - Vocabulary NOTE.

GB/T 12604.1-2020, Non-destructive testing -- Terminology -- Ultrasonic testing (ISO 5577.2017, MOD)

3 Terms and definitions

For the purposes of this document, the terms and definitions defined in ISO 5577 and ISO 17635 apply.

4 Symbols

The symbols in Table 1 apply.

5 General

The purpose of this document is to describe general techniques of ultrasonic weld testing, using standard criteria, for the most commonly used welded joints at object temperatures in the range 0°C to 60°C. The specific requirements of this document cover the test equipment, preparation, performance of testing, and reporting. The parameters specified, in particular those for the probes, are compatible with the requirements of ISO 11666 and ISO 23279.

6 Information required prior to testing

The definitions and requirements in this document normally satisfy the need for a written test procedure. Where this is not the case, or where the techniques described in this document are not applicable to the welded joint to be tested, additional written test procedures shall be used, if required by specification.

7 Requirements for personnel and equipment

Any equipment used for testing in conjunction with this document shall comply with the requirements of ISO 22232 (all parts). The transducer size shall be chosen according to the ultrasonic path to be used and the frequency. The coupling media shall be in accordance with ISO 16810. The coupling medium used for range and sensitivity setting and for the test shall be the same.

8 Testing volume

The testing volume (see Figure 2) is defined as the zone which includes weld and parent material and the width of the heat-affected zone on each side of the weld or at least 10 mm if the width of the heat-affected zone is not known.