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

GB/T 20935.3-2018

**Metal materials -- Method of electromagnetic acoustic inspection -- Part
3: Standard practice for ultrasonic surface examinations using
electromagnetic acoustic transducer (EMAT) techniques**

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Foreword

GB/T 20935 "Electromagnetic Ultrasonic Testing Method for Metal Materials" is divided into the following three parts.

- Part 1. Guide to electromagnetic ultrasonic transducers;
- Part 2. Methods for ultrasonic testing using electromagnetic ultrasonic transducer technology;
- Part 3. Ultrasonic surface detection using electromagnetic ultrasonic transducer technology.

This part is the third part of GB/T 20935.

This part is drafted in accordance with the rules given in GB/T 1.1-2009.

This part replaces GB/T 20935.3-2009 "Electromagnetic Ultrasonic Testing Methods for Metallic Materials - Part 3. Using Electromagnetic Ultrasonic Transducers

The method of technology for ultrasonic surface inspection", compared with GB/T 20935.3-2009, the main technical changes are as follows.

- The items in the scope were merged, and the original standard "1.6 part of the standard unit with international units" and "1.7 headquarters" were deleted.

Do not discuss security issues related to use. It is the responsibility of the user to establish procedures for the safety and health of the person before use.

Set its scope of application. (see Chapter 1,.2009 editions 1.6 and 1.7);

- Amend the 8.4 "NdFeB permanent magnets can be used for all electromagnetic ultrasonic transducer surface wave technology" to "at room temperature (nominal temperature)

When used below 82 ° C), NdFeB permanent magnets can be used for all electromagnetic ultrasonic transducer surface wave technology. At high temperatures

In use, it may be necessary to use more complex magnetization techniques, such as

electromagnets or special permanent magnets designed for high temperatures. " (see 8.4,.2009)

Version 8.4);

--- "As with piezoelectric ultrasound, the surface roughness of the workpiece has a great influence on the attenuation. When using an electromagnetic ultrasonic transducer, it is lifted off.

Changes in the gap may lead to false positives, and when the piezoelectric ultrasonic technique uses the attenuation method, the lift-off will not be caused by the use of the couplant

The change in signal amplitude is modified as "in piezoelectric ultrasonic technology, surface roughness has a great influence on attenuation. Using electromagnetic ultrasonic exchange

In the case of energy technology, a change in lift distance can lead to false positives. However, if all the sensors are the same when testing

The piezoelectric ultrasonic technology using the coupling attenuation compensation method can keep the signal level stable. " (see 10.3.3,.2009)

Version 10.2.7);

--- Added general requirements to the test method (see 10.1);

--- Added "and re-test all materials detected after the most recent sensitivity calibration" (see 10.1.4);

--- Added "In fact, the weld height and root signal are not detected due to the formation of diffraction, just like the specular reflector will reverse the signal

Shoot the same. This makes it possible to perform a linear scan of the weld and detect surface discontinuities in all directions, and the detection is not

The reflected signal to the weld height. "(see 10.4.2,.2009 edition 10.3.5).

This part was proposed by the China Iron and Steel Association.

This part is under the jurisdiction of the National Steel Standardization Technical Committee (SAC/TC183).

This section drafted by. Iron and Steel Research Institute, Steel Research Institute Testing Technology Co., Ltd., Metallurgical Industry Information Standards Institute.

1 Scope

This part of GB/T 20935 gives the use of electromagnetic ultrasonic transducer (EMAT) technology to detect material surface discontinuities (eg.

Cracks, cracks, folds, cold partitions, delamination, leakage, unfused) and near surface discontinuities that are less than or equal to the surface wavelength range

An overview, significance, and use of the principles of sexuality, and specifies the application conditions, techniques, devices, calibrations, test methods, results determination, and test reports.

This section applies to the detection of the production process of the product, the detection of the final product and the detection of the repair.

This section applies to non-contact detection techniques that use electromagnetic methods to excite surface waves in materials and their applicable materials, including non-ferrous Magnetic and ferromagnetic conductive materials.

Note. This section does not provide criteria for assessing discontinuities. The determination, grading and final assessment of discontinuities are not based on other technical specifications or agreements.

The continuation type, size, location, and orientation are judged to be qualified.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article.

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

GB/T 9445 Non-destructive testing personnel qualification and certification

GB/T 11343 non-destructive testing contact ultrasonic oblique probe detection method

GB/T 12604.1 Non-destructive testing terminology ultrasonic testing

GB/T 12604.6 Non-destructive testing term eddy current testing

GB/T 20935.1 Electromagnetic Ultrasonic Testing Methods for Metallic Materials - Part 1. Guide to Electromagnetic Ultrasonic Transducers

3 Terms and definitions

The terms and definitions defined in GB/T 12604.1, GB/T 12604.6 and GB/T 20935.1 apply to this document.

4 Principles Overview

4.1 This section describes the use of electromagnetic methods to excite surface wave technology, through the reflection of reflected or transmitted waves at the discontinuous