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

GB/T 44046-2024

**Non-destructive testing - Metamagnetic memory - Inspection of
welded joints**

无损检测 金属磁记忆 焊接接头检测

(English Translation)

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting:

This document is equivalent to ISO 24497-2:2020 "Non-destructive testing of metal magnetic memory - Part 2: Testing of welded joints":

The following minimal editorial changes were made to this document:

--- Change the name of the standard to "Non-destructive testing of metal magnetic memory welded joints":

--- Added Notes (see 4.1, 4:2):

1 Scope

This document specifies the Metal Magnetic Memory (MMM) technique for the non-destructive testing (NDT) magnetic testing of welded joints:

General requirements of:

This document is applicable to the inspection of welded joints of various types of ferromagnetic pipelines, containers, equipment and metal structure products agreed upon by all parties:

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document:

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document:

GB/T 26641-2021 General requirements for non-destructive testing of magnetic memory (ISO 24497-1:2020, IDT) for metallic materials) Note: GB/T 34628-2017 General rules for the application of non-destructive testing of welds to metallic materials (ISO 17635:2016, IDT)

3 Terms and definitions

The terms and definitions defined in GB/T 26641-2021 apply to this document:

4 Basic Principles

4.1

MMM detection is a technology that reflects the process characteristics of welded joints based on measuring and analyzing the distribution of magnetic field (SF) on the surface of welded joints:

For example, the residual magnetic field strength generated during welding is the main signal source for SF detection:

Note: Surface magnetic field (SF) refers to the surface stray magnetic field:

4.2

MMM testing is carried out by surface magnetic field indication (SFI) testing for key areas of welded joints of vessels, pipelines, equipment and components:

Other non-destructive testing recommendations are available:

Note: Surface Field Indication (SFI) stands for Surface Stray Magnetic Field Indication:

4.3

MMM testing is applicable to all types of ferromagnetic and metastable austenitic steels and their alloys, as well as cast iron of any size and structure:

Welded joints of various structures (butt joints, T-joints, corner joints, lap joints, end joints,

intermittent welding, etc.):

Note: The evaluation of SFI of metastable austenitic steels is limited to the ferromagnetic phase:

4.4

MMM testing can be performed on welded joints after construction, in service, or after repair:

4.5

MMM detection can find the following displays:

- Areas where various types of micro-defects and macro-defects (pores, slag inclusions, discontinuities, cracks, fractures) may occur;
- SFI caused by the welding process and SFI along the weld joint:

4.6

MMM testing can be used to test the following welding properties:

- Degradation of welding quality due to defects and the extension of defects;
- Quality of welded joints, used for selection, assessment and optimization of welding processes:

4.7

Due to the limitations of the testing personnel and the working range of the probe, the temperature range for MMM testing should be between -20°C and 60°C: