
**Non-destructive testing — Metal magnetic
memory —**

**Part 3:
Inspection of welded joints**

*Essais non destructifs — Mémoire magnétique des métaux —
Partie 3: Examen des assemblages soudés*



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 24497-3 was prepared by the International Institute of Welding, Commission V, *Quality control and quality assurance of welded products*, recognized as an international standardizing body in the field of welding in accordance with Council Resolution 42/1999.

Requests for official interpretations of any aspect of this part of ISO 24497 should be directed to the ISO Central Secretariat, who will forward them to the IIW Secretariat for an official response.

ISO 24497 consists of the following parts, under the general title *Non-destructive testing — Metal magnetic memory*:

- *Part 1: Vocabulary*
- *Part 2: General requirements*
- *Part 3: Inspection of welded joints*

Non-destructive testing — Metal magnetic memory —

Part 3: Inspection of welded joints

1 Scope

This part of ISO 24497 specifies the general requirements for the application of the metal magnetic memory inspection method (MMM inspection) as a non-destructive testing method for quality assurance of welded joints of pressurized components.

This part of ISO 24497 may be applied to welded joints in any type of products, pipelines, vessels, equipment, and metal constructions, as agreed with the purchaser.

The terms and definitions for the process are contained in ISO 24497-1, and the general requirements of the process are in ISO 24497-2.

2 Basic principles

2.1 MMM inspection is based on measurement and analysis of the distribution of self-magnetic-leakage fields (SMLF) in the material of welded joints reflecting their technological history. Natural magnetization, induced during the welding process in the Earth's magnetic field, is used for the inspection.

2.2 MMM inspection permits the detection of mechanical stress concentration zones (SCZ) and gives recommendations for additional non-destructive inspections in critical zones of vessels, pipelines, equipment, and construction welded joints.

2.3 MMM inspection is complementary in its capability to other well-known non-destructive testing methods (ultrasonic inspection, magnetic particle inspection, liquid penetrant inspection, and hardness testing).

2.4 MMM inspection allows the testing of welded joints of any size and configuration (butt, tee, fillet, lap, edge, intermittent, etc.) regardless of weld material thickness on all types of ferromagnetic and austenitic steels and alloys, as well as on cast irons.

2.5 MMM inspection may be carried out on the original weld after construction, during operation, or after repair.

2.6 The following conditions can be found during MMM inspection:

- residual stress concentration zones caused by welding, and their distribution along the welded joint;
- zones of probable location of all types of micro- and macro-defects (pores, slag inclusions, discontinuities, cracks, ruptures).

Defect classification by magnetic parameters is carried out following special testing techniques for a specific welded joint.