



## **Non-destructive testing — Eddy current testing — General principles**

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AS ISO 15549:2020

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The following are represented on Committee MT-007:

- Australasian Thermographers Association
- Australian Institute for Non-Destructive Testing
- Australian Nuclear Science and Technology Organisation
- Austrroads
- Engineers Australia
- Institute of Electrical Inspectors
- National Aerospace Non-Destructive Testing Board of Australia
- Weld Australia

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## Preface

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee MT-007, Non-Destructive Testing of Metals and Materials.

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this Standard is to define the general principles to be applied to non-destructive eddy current examination of products and materials in order to ensure defined and repeatable performance.

This Standard includes guidelines for the preparation of application documents which describe the specific requirements for the application of the eddy current method to a particular type of product.

This Standard is identical with, and has been reproduced from, ISO 15549:2019, *Non-destructive testing — Eddy current testing — General principles*.

As this document has been reproduced from an International Standard, a full point substitutes for a comma when referring to a decimal marker.

Australian or Australian/New Zealand Standards that are identical to those of international normative references may be used interchangeably. Refer to the online catalogue for information on specific Standards.

The terms “normative” and “informative” are used in Standards to define the application of the appendices or annexes to which they apply. A “normative” appendix or annex is an integral part of a Standard, whereas an “informative” appendix or annex is only for information and guidance.

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 135, *Non-destructive testing*, Subcommittee SC 4, *Eddy current testing*.

This second edition cancels and replaces the first edition (ISO 15549:2008), which has been technically revised.

The main change compared to the previous edition is as follows:

- rewriting of [Clause 5](#) "Qualification of personnel".

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

# Australian Standard<sup>®</sup>

## Non-destructive testing — Eddy current testing — General principles

### 1 Scope

This document defines the general principles to be applied to non-destructive eddy current examination of products and materials in order to ensure defined and repeatable performance.

It includes guidelines for the preparation of application documents which describe the specific requirements for the application of the eddy current method to a particular type of product.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 9712, *Non-destructive testing — Qualification and certification of NDT personnel*

ISO 12718<sup>1)</sup>, *Non-destructive testing — Eddy current testing — Vocabulary*

ISO 15548-1, *Non-destructive testing — Equipment for eddy current examination — Part 1: Instrument characteristics and verification*

ISO 15548-2, *Non-destructive testing — Equipment for eddy current examination — Part 2: Probe characteristics and verification*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12718 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

### 4 General principles

The eddy current examination is based upon the induction of an alternating electric current in a conducting material. The quantity measured and analysed is related to the distribution of the induced currents and it is represented by a vector in the complex plane.

The distribution of eddy currents in the depth of a material is governed by physical laws, the density of the currents decreasing drastically with the increasing depth. For a given frequency, this decrease is an exponential function of the depth.

The following properties, alone or in combination, of the product to be tested influence the measured quantity:

- the electrical conductivity of the material;
- the magnetic permeability of the material;
- the size and geometry of the product to be tested;
- the geometrical relationship between the eddy current probe and the product to be tested.

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1) Under preparation.