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SWEDISH STANDARDS INSTITUTE

Oförstörande provning – Induktiv provning – Terminologi (ISO 12718:2019)

Non-destructive testing – Eddy current testing – Vocabulary (ISO 12718:2019)

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Europastandarden EN ISO 12718:2019 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN ISO 12718:2019.

Denna standard ersätter SS-EN ISO 12718:2008, utgåva 1

The European Standard EN ISO 12718:2019 has the status of a Swedish Standard. This document contains the official version of EN ISO 12718:2019.

This standard supersedes the SS-EN ISO 12718:2008, edition 1

Upplysningar om sakinnehållet i standarden lämnas av SIS, Swedish Standards Institute, telefon 08-555 520 00. Standarder kan beställas hos SIS som även lämnar allmänna upplysningar om svensk och utländsk standard.

Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS, who can also provide general information about Swedish and foreign standards.

Denna standard är framtagen av kommittén för Oförstörande provning, SIS/TK 125.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 12718

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Supersedes EN ISO 12718:2008

English Version

Non-destructive testing - Eddy current testing - Vocabulary (ISO 12718:2019)

Essais non destructifs - Contrôle par courants de Foucault - Vocabulaire ISO 12718:2019)

Zerstörungsfreie Prüfung - Wirbelstromprüfung - Terminologie (ISO 12718:2019)

This European Standard was approved by CEN on 29 April 2019.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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European foreword

This document (EN ISO 12718:2019) has been prepared by Technical Committee ISO/TC 135 "Non-destructive testing" in collaboration with Technical Committee CEN/TC 138 “Non-destructive testing” the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 2020, and conflicting national standards shall be withdrawn at the latest by March 2020.

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

This document supersedes EN ISO 12718:2008.

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Endorsement notice

The text of ISO 12718:2019 has been approved by CEN as EN ISO 12718:2019 without any modification.

Non-destructive testing — Eddy current testing — Vocabulary

1 Scope

This document defines terms used in eddy current testing.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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/

3.1 General terms specifically associated with the eddy current test method

3.1.1
background noise
noise (3.1.26) originating from geometric and metallurgical variations in the product to be tested

Note 1 to entry: These effects may also be the subject of the measurement.

3.1.2
balance
compensation of the signal, corresponding to the *operating point* (3.5.20), to achieve a predetermined value

Note 1 to entry: The predetermined value can be, for example, zero.

3.1.3
bandwidth
range of frequencies in which a signal is transmitted or amplified in a linear way

Note 1 to entry: Bandwidth is defined by the lower and upper cut-off frequencies which conventionally correspond to an attenuation of 3 dB.

Note 2 to entry: Bandwidth can be defined for any or all elements of the system, such as a *filter* (3.4.14), a cable or an amplifier.

3.1.4
bucking signal
compensating signal
signal which is injected to balance a signal corresponding to the *operating point* (3.5.20)

3.1.5
characteristic frequency
f
conventional quantity used as a frequency unit

Note 1 to entry: Characteristic frequency is derived from the mathematical model using Bessel functions to describe the *eddy current distribution* (3.1.10) in a cylindrical bar. The value is dependent on the characteristics of the product which influence this distribution, e.g. electrical conductivity, magnetic permeability and diameter.

Note 2 to entry: Characteristic frequency, *f*, is given by:

$$f = \frac{1}{2\pi\sigma\mu r^2}$$

where

μ is the magnetic permeability;

σ is the electrical conductivity;

r is the radius of the cylinder.

3.1.6
characteristic frequency ratio
dimensionless ratio of the *excitation frequency* (3.1.18) to the *characteristic frequency* (3.1.5) which enables the behaviour of electromagnetic quantities involved in the test to be generalized

Note 1 to entry: See *law of similarity* (3.1.24).

3.1.7
coupling factor
ratio of the *excitation* (3.1.19) flux through the product to be tested to the total excitation flux, which measures the *electromagnetic coupling* (3.1.15) between the *probe* (3.3.40) and the product to be tested

3.1.8
demodulated signal
eddy current signal after demodulation

3.1.9
differentiated signal
output signal of a *differential filter* (3.4.8)

3.1.10
eddy current distribution
vector field of eddy current density

3.1.11
eddy current testing
non-destructive testing method using the electromagnetic effects of induced currents to evaluate the product to be tested

3.1.12
eddy currents
electric current induced in a conductive material by a varying magnetic field

3.1.13
effective depth of penetration
depth in the material beyond which the electromagnetic effects of *eddy currents* (3.1.12) can no longer be used for testing with a given system

3.1.14
effective permeability
complex quantity introduced to account for the weakening of the magnetic field strength within cylindrical objects due to the eddy current flow

Note 1 to entry: Effective permeability is used to calculate the output voltage from a *secondary coil* (3.3.49) of a *coaxial probe* (3.3.8).

3.1.15
electromagnetic coupling
electromagnetic interaction between two or more circuits

Note 1 to entry: In eddy current examination, the product to be tested is a circuit.

3.1.16
electromagnetic testing
class of non-destructive test methods that uses electromagnetic energy having frequencies lower than those of infrared light

Note 1 to entry: For example, *eddy current testing* (3.1.11) and microwave methods are classed as electromagnetic testing.

3.1.17
excitation current
current in the *primary coil* (3.3.39) *arrangement* (3.3.6) (exciting element)

3.1.18
excitation frequency
nominal frequency of the *excitation current* (3.1.17)

3.1.19
excitation
induction
creation of *eddy currents* (3.1.12)

3.1.20
impedance plane diagram
graphical representation of the locus of points, indicating the variations in the impedance of a test coil as a function of the *test parameters* (3.5.39)

3.1.21
in phase demodulation
use of *synchronous demodulation* (3.1.38) to extract the active (resistive) component from the *probe* (3.3.40) signal

3.1.22
instrument noise
noise (3.1.26) originating in the *eddy current instrument* (3.4.11)

3.1.23
interference noise
noise (3.1.26) originating from sources external to the *eddy current testing system* (3.4.12)

3.1.24
law of similarity
law which permits the general description of electromagnetic phenomena for geometrically similar products

Note 1 to entry: The *eddy current distribution* (3.1.10) is the same provided that the *characteristic frequency ratio* (3.1.6) is the same.

3.1.25
loaded coil impedance
apparent impedance
impedance of a test coil coupled to a conductive product to be tested

3.1.26
noise
unwanted signal which can corrupt the measurement