Procedure For Eddy Current Testing of Welds in Accordance with BS EN ISO 17643

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1. Scope

This document is written in accordance with the general principles of BS EN ISO 15549 (2019) and meets the requirements of BS EN ISO 17643 (2015). It defines the use of specially designed Eddy Current surface coils for the detection of surface-breaking planar discontinuities on all accessible surfaces of welds including heat-affected zones and base material using complex plane analysis.

This procedure covers most weldment configurations and is intended for use on mainly ferrous weldments, with a weldment being defined as the regions of applicable cap, root, heat affected zones (HAZ) and specified areas of adjacent parent material. The testing of non-ferrous material may be permitted by special agreement.

The techniques described herein can be applied to coated and uncoated material during fabrication and in-service, both onshore and offshore.

2. References

This procedure refers to or is derived from the following documents:

BS EN ISO 9712 (2022) – Non-destructive testing – Qualification and certification of NDT personnel.

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

BS EN ISO 17643 (2015) – Non-destructive testing – Eddy current examination of welds by complex plane analysis.

BS EN ISO 15548-1 (2013) – Non-destructive testing – Equipment for eddy current examination – Part 1: Instrument characteristics and verification.

BS EN ISO 15548-2 (2013) – Non-destructive testing – Equipment for eddy current inspection – Part 2: Probe characteristics and verification.

BS EN ISO 15548-3 (2008) – Non-destructive testing – Equipment for eddy current inspection – Part 3: System characteristics and verification.

BS EN ISO 15549 (2019) – Non-destructive testing – Eddy current testing – General principles.

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3. Terminology

General terminology used in this procedure can be found in BS EN ISO 12718 (2019). A list of useful terms are stated in table 1.

For clarity, any reference to Full Screen Height (FSH) refers to deflection of the operating point from screen centre i.e. 100% FSH would be a 50% screen height deflection from screen centre.

Positive direction – vertical upwards on screen

Negative direction – vertical downwards on screen

Table 1. Definition of terms relevant to ET

Term	*Definition*
balance	compensation of the signal, corresponding to the operating point, to achieve a predetermined value, for example zero point
impedance plane diagram	graphical representation of the focus points, indicating the variation in the impedance of a test coil as a function of the test parameters
noise	any unwanted signal which could corrupt the measurement
phase reference	direction in the complex plane display chosen as the origin for the phase measurement
probe	eddy current transducer Physical device containing excitation elements and receiving elements.
lift off	indication visible after removal of the magnetic particles or that can be detected by the use of contrast dye penetrant

4. Health & Safety

Personnel working to this procedure shall work in such a manner as to comply with the Health and Safety at Work act (1974)

All consumables used shall have accompanying COSHH data sheets and shall be disposed of in a way that is non-injurious to site personnel or to the environment.

Personnel working to this procedure shall at all times wear mandatory PPE; overalls, safety boots, hard hat, high visibility clothing, etc.

Mains powered equipment shall be in good working order and have been PAT testing within the last 12 months.

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