



EF European Federation for
Non-Destructive Testing
NDT



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EUROPEAN CONFERENCE ON NON-DESTRUCTIVE TESTING

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A New ISO 9712 ET Certification Structure for a Modern World – Including ISO 9712 Eddy Current Array Training & Certification

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BINDT Incoming Vice-President, BINDT CTC ET Working Group Chair, BINDT ET Industry Users Group Founder/Chair

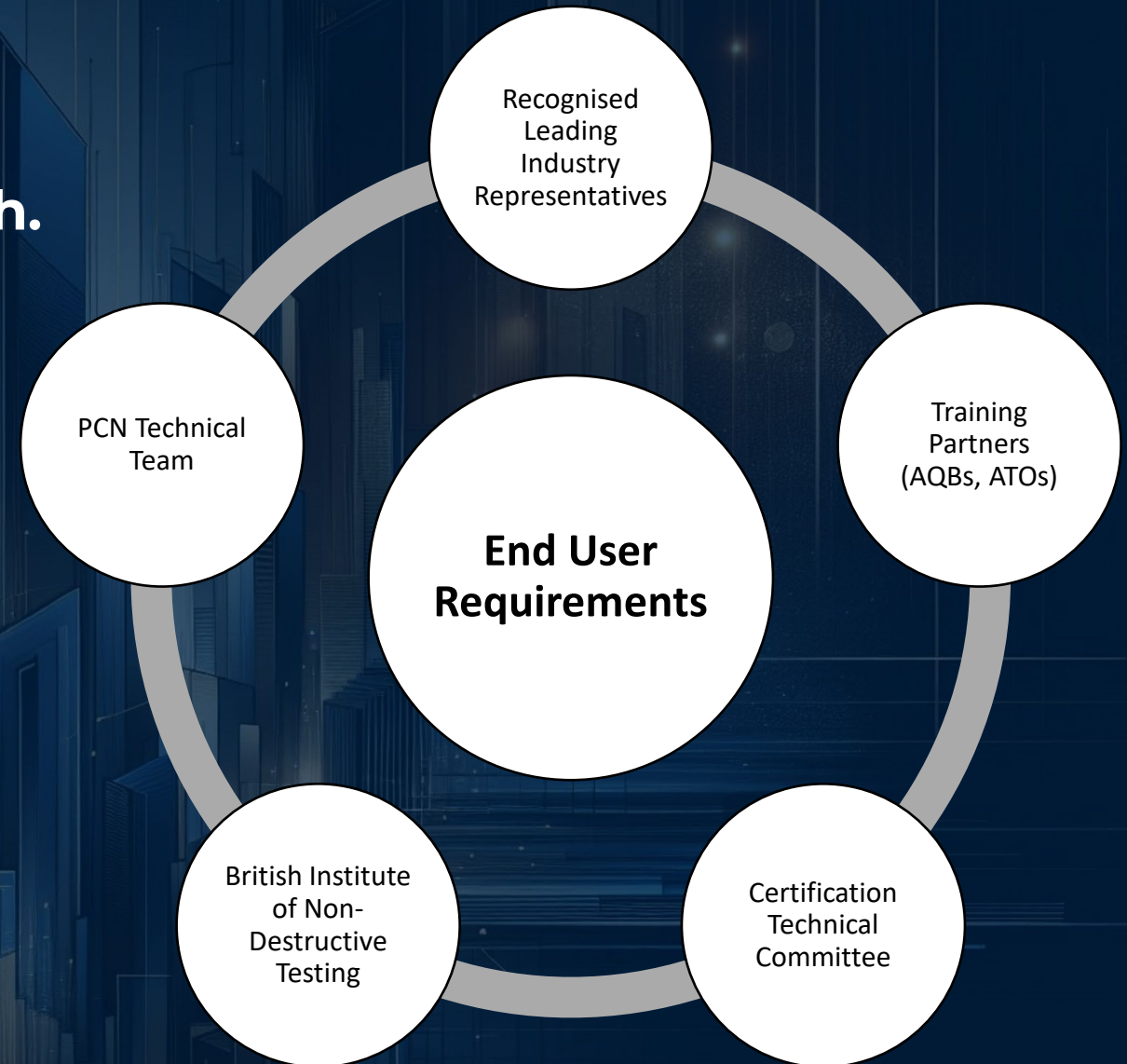
MOTIVATION

The landscape of electromagnetic testing has dramatically changed in recent times.

As certification bodies, what are we doing to:

- understand these changes and the needs of industry end-users.
- adapt existing certification structures to accommodate their needs.
- ensure certification structures remain reliant yet adaptable to future changes in end-user requirements.

An industry end-user driven approach.



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Certification structure

- Flexible
- Modular
- Customisable

Training syllabus

- Modern
- Relevant
- Accessible

Eddy current arrays

- Surface probes (not tubes)
- Welds and wrought products only

Electromagnetic Testing

ISO 9712
METHOD



TECHNIQUE

SECTOR
(LEVEL 3 CERTIFICATION)



EXAMINATION KEY		
General theory	Specific theory (Level 3 certification)	Practical exam element (Level 2 certification)

LEVEL 2
CERTIFICATION

Electromagnetic Testing

ISO 9712
METHOD



One shared General Theory paper across different ET techniques.

- Reduces training time (- approx. 1 week) for those adding new techniques with existing ET certifications. More financially viable for sponsoring companies and those self employed.
- Reduces unnecessary stress to candidates – they have already demonstrated prior knowledge.
- General theory paper is truly general principles, not aligned to any particular ET technique.

SECTOR
(LEVEL 3 CERTIFICATION)

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EXAMINATION KEY

General theory

Specific theory

(Level 3 certification)

Practical exam element

(Level 2 certification)

LEVEL 2
CERTIFICATION

Electromagnetic Testing

ISO 9712
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TECHNIQUE

SECTOR
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LEVEL 2
CERTIFICATION

Eddy-current testing

Array testing

Pulsed eddy
current testing

Alternating current field
measurement testing

Welds

Wrought
products

Tubes

Surface arrays

Wrought
products

Multi

EXAMINATION KEY

General theory

Specific theory
(Level 3 certification)

Practical exam element
(Level 2 certification)

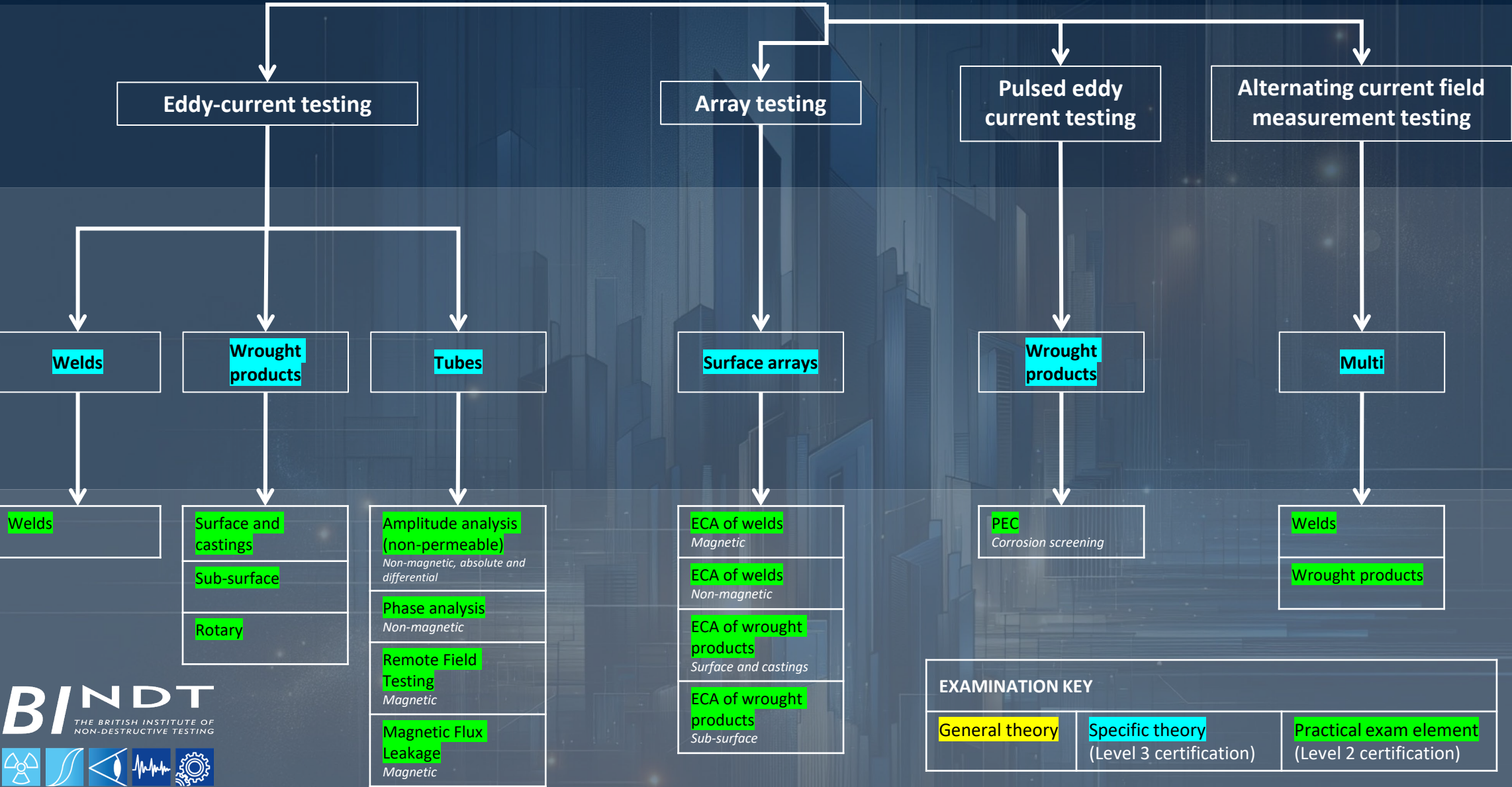
Electromagnetic Testing

ISO 9712
METHOD

TECHNIQUE

SECTOR
(LEVEL 3 CERTIFICATION)

LEVEL 2
CERTIFICATION



EDDY CURRENT ARRAYS

Provision of ISO 9712 certification and training of their use.



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EDDY CURRENT ARRAYS

Provision of ISO 9712 certification and training of their use.

Proposed certification in:

Sector	Scope	Example application
Welds	Magnetic (ferromagnetic)	Surface-breaking discontinuities in carbon steel welds.
	Non-magnetic (non-ferromagnetic)	Surface-breaking discontinuities in aluminium welds.
Wrought products	Surface (including castings)	Surface-breaking discontinuities in extruded part.
	Sub-surface	Sub-surface discontinuities in aluminium sandwich layer structures.

TRAINING SYLLABUS

A modern scope of training, for modern times.

Limitations of legacy syllabus:

- includes using outdated equipment / niche applications – e.g. physically printed strip chart paper, CRT displays.
- includes candidates performing calculations of no real world use or relevance.
- holes in scope – e.g. no mention of reflection probes in eddy current testing of wrought products.
- inconsistent language in exam questions (less accessible for international candidates).
- inconsistent formula sheets used across PCN authorised examination centres.
- limited pool of exam questions.
- **is a list of key words and does not actually specify WHAT the candidate needs to know.**

TRAINING SYLLABUS

A modern scope of training, for modern times.

Magnetic permeability

PCN Level	Learning objective	Example exam questions
1	Describe magnetic permeability as the ease of which a material can be magnetized.	1. Which of the following describes the ease of which a material can be magnetised? 2. Magnetic permeability can be described as:
2	Describe magnetic permeability as the ratio of magnetic flux density (B) to magnetizing force (H), i.e. B/H.	1. Magnetic permeability can be described as: 2. The ratio of magnetic flux density inside a material to magnetizing force applied to it, can be used to calculate: 3. The ratio of B/H for a given material describes its:
3	Describe magnetic permeability as the gradient (steepness) of the material's B-H hysteresis curve.	1. On a B-H curve, the steepness (gradient) of the line can be used to calculate: 2. What metric of a B-H curve can be used to calculate a material's magnetic permeability?

SUMMARY

Exciting times ahead.

- New modularised ET certification structure.
- ISO 9712 eddy current array training/certification provision.
- Modern ET training syllabus.

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