

PCN24/GEN/APP/MT

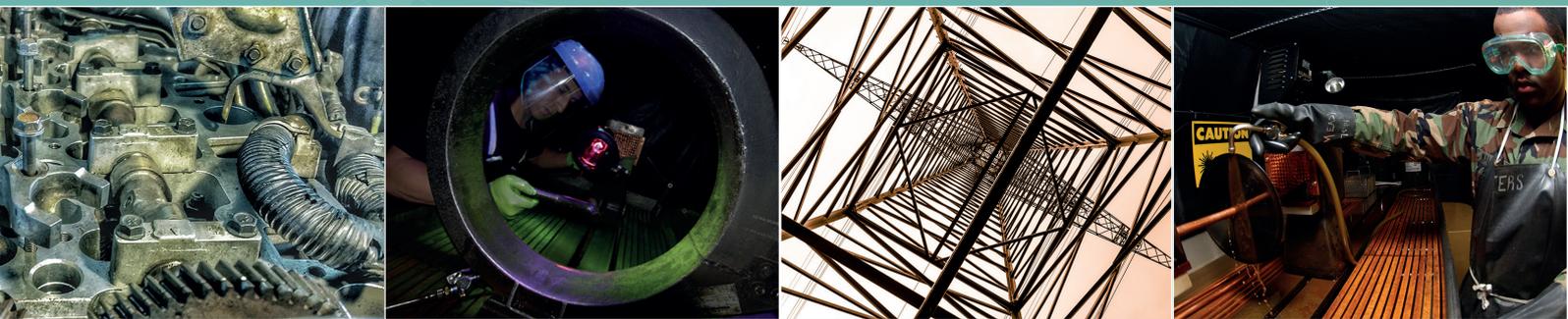
PCN certification eligibility and examination requirements for persons engaged in non-destructive testing (NDT) using the magnetic particle testing (MT) method at Levels 1, 2 and 3

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The British Institute of Non-Destructive Testing is an accredited Certification Body offering personnel and quality management systems assessment and certification against criteria set out in international and European standards through the PCN Certification Scheme.

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1. Scope

This document prescribes the specific requirements and procedures by which personnel may be examined and, where successful, certified to use the magnetic particle testing (MT) method and associated NDT techniques for the testing of metallic materials listed within BS EN ISO 9712 Annex A, specifically A.2.

Requirements contained within this document are additional to those contained in the current edition of PCN24/GEN: General requirements for PCN qualification and certification of NDT personnel, drafted to meet the requirements of BS EN ISO 9712:2022.

The full PCN training, examination and eligibility requirements are set out in PCN24/GEN. This Appendix document provides the reader with a glance at PCN examination requirements for PCN MT certification at all levels. Except where exemptions apply, all candidates will be required to attempt an examination comprising the appropriate examination elements required for certification listed herein.

2. Associated documents

- 2.1 PCN24/GEN: General requirements for qualification and PCN certification of NDT personnel.
- 2.2 BS EN ISO 9712: Non-destructive testing – Qualification and certification of NDT personnel.
- 2.3 PCN/GEN/SYLLABUS DOCUMENT.
- 2.4 PCN/GEN/SPECIMEN QUESTIONS COMPENDIUM.

3. Employer responsibilities

- 3.1 **IMPORTANT:** Candidates and employers shall ensure that they are conversant with responsibilities ascribed to both candidate and employer, and that it is the employer's duty to issue PCN-certified employees with the 'authority to operate' before PCN certificate holders carry out NDT tasks on behalf of the employer or employer's customers.
- 3.2 See PCN24/GEN – Section 5.5.

4. PCN (MT) certification available, for single- or multi-sector use

- 4.1 PCN Level 1 MT.
- 4.2 PCN Level 2 MT.
- 4.3 PCN Level 3 MT.
- 4.4 PCN certification is available for any combination of product where a minimum of one specimen has been tested from each product group for multi-sector certification and a minimum of two specimens have been tested from a single product sector where single-sector certification is required. See section 7 herein.

5. Practical testing techniques available for certification

- 5.1 Portable equipment only.
- 5.2 Fixed installations only.
- 5.3 Portable equipment and fixed installations combined.

6. Industrial sectors where PCN (MT) certification may be applied

- 6.1 Manufacturing.
- 6.2 Pre- and in-service testing, which includes manufacturing.

7. Product sectors for (MT) certification (*BS EN ISO 9712 Annex A, A.2 for metallic materials*)

- 7.1 Castings (c) (ferrous materials).

- 7.2 Forgings (f) and wrought products (wp), which includes:
 - (a) For forgings, all types of forging: ferrous materials; and
 - (b) For wrought products (ferrous products such as plates, bar and rod).
- 7.3 Welds (w) (all types of weld, including soldering, for ferrous materials).

8. Examination eligibility

- 8.1 Candidates shall provide documentary evidence of acceptable near vision acuity and colour vision perception in accordance with PCN24/GEN requirements.
- 8.2 Candidates shall provide documentary evidence of having achieved the required amount of practical industrial experience in accordance with PCN24/GEN requirements.
- 8.3 Candidates shall provide documentary evidence of having satisfactorily completed an approved NDT training course within the NDT method and at the required level for certification in accordance with PCN24/GEN.

9. Examination administration overview

- 9.1 The full PCN examination format linked to the candidate's personal certification requirements shall be as described in PCN24/GEN. This PCN examination requirements Appendix document highlights to candidates the potential examination elements which could be attempted during a PCN examination, dependent upon whether the examination attempted is for initial, recertification, retest or for supplementary certification.
- 9.2 Examination time shall be confirmed to the candidate on the front of the PCN examination paper. Additional time may be allowed at the discretion of the Authorised Qualifying Body (AQB) for those circumstances detailed below at 9.3.1 and 9.3.2.
- 9.3 All additional examination time extensions shall be recorded by the AQB prior to examination commencement.
- 9.3.1 Time extension scenario 1: where the candidate's primary language is not English, who may require additional reading time (25%).
- 9.3.2 Time extension scenario 2: where the candidate has a disability, such as dyslexia, and may require additional reading time (25%). It will be a requirement for candidates to supply to the AQB a medical declaration/attestation from a suitably qualified medical professional confirming matters. A copy of the declaration/attestation shall be retained within the candidate's examination records file.

10. PCN Level 1 – Initial certification

10.1 General theory written examination element for MT

- 10.1.1 Written examination element specific to the general theory of the **MAGNETIC** particle testing method.
- 10.1.2 40 multiple-choice questions.
- 10.1.3 Time allowed per question: 2 minutes.
- 10.1.4 Pass mark: 70%.

10.2 Sector-specific written theory examination element for MT

- 10.2.1 Theoretical written examination element specific to the application and use of the **MAGNETIC** Particle Testing method.
- 10.2.2 35 multiple-choice questions: (*exceeds BS EN ISO 9712*).
- 10.2.3 Where the specific theory examination element covers two or more sectors, the examination shall take into account the industrial or product sectors concerned and questions shall be spread evenly across the product sectors for examination.
- 10.2.4 Time allowed per question: 3 minutes.
- 10.2.5 Pass mark: 70%.

10.3 Sector-specific practical examination element

10.3.1 The practical examination element requires candidates to test practical specimens, record the resulting information to the degree required and report the results in the AQB's desired format. Specimens shall be sector (one or more) specific, representing defined field geometries and shall contain discontinuities representative of those likely to occur during manufacturing or during in-service life. Defects may be natural or manufactured and the examination shall be as follows:

10.4 Practical examination control checks

10.4.1 Candidates shall demonstrate knowledge and correct use of NDT equipment and/or NDT media to include system and/or media control and validity of verifications and/or media, as per Annex D Table D.1 Item 1 within BS EN ISO 9712 (control checks).

10.4.2 Time allowed: 30 minutes.

10.5 Practical testing – Level 1

10.5.1 Level 1 candidates shall follow written NDT instructions provided to them by the examiner to test product sector (one or more) specific practical specimens.

10.5.2 Where the certification examination covers two or more product sectors, practical specimens tested shall include a **MINIMUM** of one specimen from each product sector for certification. This could result in candidates demonstrating their practical ability to deploy a number of different NDT techniques within the NDT method.

10.5.3 The number of specimens tested shall be as advised by the AQB at the time of examination to meet the requirements of BS EN ISO 9712 Annex B. Each specimen shall be different in character, *ie* in product form, material specification, shape, size or discontinuity type.

10.5.4 Single product sector practical examination candidates shall be required to test a minimum of two specimens and, for multiple product sectors, a minimum of one specimen from each product sector for certification.

10.5.5 For an industrial sector-related practical examination: candidates shall be required to test a minimum of two specimens, representative of products typically tested within the industrial sector certification.

10.5.6 Candidates shall report results obtained during testing in the AQB's required format.

10.5.7 The recommended time allowed per specimen tested is 1 hour. However, the Certification Body (BINDT) allows the AQB to extend this time period if required based upon the component complexity and test technique deployed.

10.5.8 Pass mark: $\geq 70\%$ for each specimen tested.

11. PCN Level 2 – Initial certification

11.1 Candidates shall follow the examination process requirements described for Level 1 certification but at the required theoretical (general and specific) knowledge level for Level 2 certification, and in addition they shall demonstrate the following enhanced practical testing requirements:

11.2 Level 2 candidates shall **SELECT** the applicable NDT technique and determine the operating conditions required related to a given code, standard or specification.

11.3 Candidates shall test prescribed specimens, recording and **INTERPRETING** the resulting information to the degree required, reporting the results obtained in the AQB's desired format.

11.4 Recommended testing time allowed per specimen tested is 1 hour. However, BINDT allows the AQB to extend this time period if required based upon component complexity and test technique deployed.

11.5 Pass mark: $\geq 70\%$ for each practical specimen tested.

11.6 Written NDT instruction writing element – Level 2

11.6.1 Candidates shall draft a written NDT instruction for one of the specimens tested in the practical examination; the specimen shall be selected by the AQB.

11.6.2 Time allowed per written instruction: 1 hour.

11.6.3 Pass mark: 70%.

12. PCN Level 3 – Basic examination

- 12.1 PCN Level 3 candidates will be required to pass a basic examination before attempting main method examinations.
- 12.2 The basic examination shall assess the candidate's knowledge of basic examination subjects using multiple-choice questions, selected in an unpredictable way from PCN's current collection of questions, which are valid on the day of the examination. See PCN24/GEN for further information.
- 12.3 Basic examination items/parts are as follows:

12.4 Part A: Technical knowledge in materials science and process technology

- 12.4.1 30 multiple-choice questions (*exceeds BS EN ISO 9712*).
- 12.4.2 Time allowed: 2 minutes per question.
- 12.4.3 Pass mark: $\geq 70\%$.

12.5 Part B: Knowledge of the Certification Body's qualification and certification system based upon the contents contained within PCN24/GEN

- 12.5.1 Ten multiple-choice questions based upon the content of PCN24/GEN.
- 12.5.2 Time allowed per question: 3 minutes per question.
- 12.5.3 Pass mark: 70%.

12.6 Part C: General knowledge of at least four methods as required for Level 2 certification, at least one method being volumetric (UT or RT)

- 12.6.1 15 multiple-choice questions from each method (total 60 possible questions).
- 12.6.2 Time allowed: 2 minutes per question.
- 12.6.3 Pass mark: 70%.
- 12.7 Successful PCN Level 3 basic examination candidates may progress to Level 3 main method training; however, they shall also be required to complete with a grade of $\geq 70\%$ the practical examination requirements for Level 2 certification where candidates do not hold current valid Level 2 certification, excepting the need to draft a written NDT instruction.
- 12.8 A candidate who holds current valid Level 2 certification shall be exempt from the need to pass the PCN Level 2 practical examination.

13. PCN Level 3 – Main method examination

- 13.1 A written examination to assess the candidate's knowledge of the main method subjects using multiple-choice questions selected in an unpredictable way from the current collection of questions approved by BINDT at the time of the examination.

13.2 Part D: Level 3 knowledge relating to the test method

- 13.2.1 30 multiple-choice questions on the method for certification.
- 13.2.2 Time allowed: 2 minutes per question.
- 13.2.3 Pass mark: 70%.

13.3 Part E: Application of the NDT method in the sector concerned, including the applicable codes, standards, specifications and procedures. This may be an open-book examination in relation to codes, standards, specifications and procedures

- 13.3.1 20 multiple-choice questions based upon the sector for specific certification.
- 13.3.2 Time allowed: 3 minutes per question.
- 13.3.3 Pass mark: 70%.

13.4 Part F: Candidates will be required to draft an NDT procedure in the relevant sector for which certification is required. All applicable codes, standards and or specifications required for the drafting of a written procedure shall be made available to the candidate during the examination by the AQB

- 13.4.1 Recommended time allowed per written procedure: 4 hours. However, the Certification Body (BINDT) allows the AQB discretion to extend this time period if required.
- 13.4.2 Pass mark: 70%.

14. Supplementary examinations

- 14.1 A certified Level 1 or Level 2 individual who would like to change sectors or add another sector for the same NDT method shall be required to attempt sector-specific theory and practical examination elements for the new sector.
- 14.2 Level 2 candidates shall also be required to write the NDT instruction for the new sector.
- 14.3 A certified Level 3 individual changing sectors or adding another sector for the same NDT method shall be required to take the sector-specific Parts E and F of the main method examination element only.
- 14.4 All candidates will be required to meet the additional industrial experience requirements as per PCN24/GEN.

15. Certification renewal and recertification

- 15.1 Comprehensive general rules for certification renewal, recertification and retest at all levels are described in PCN24/GEN, Sections 10 and 11.
- 15.2 Applications for renewal of existing Level 1 or Level 2 certification can be made using PCN document PCN24/F45.
- 15.3 Applications for renewal of Level 3 certification can be made using PCN document PCN24/F46.

16. Reference literature and essential reading

- 16.1 All associated MT reference literature can be found within PCN document PCN24/PSL72.

17. Change control record

PCN24/GEN/APP/MT – Document issue and review status		
Document issue for review	Changes/amendments	Current document status
Not applicable	New document, Issue 01	PCN24/GEN/APP/MT. Issue 01. 1 January 2024.

