PCN24/GEN/APP/UT

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

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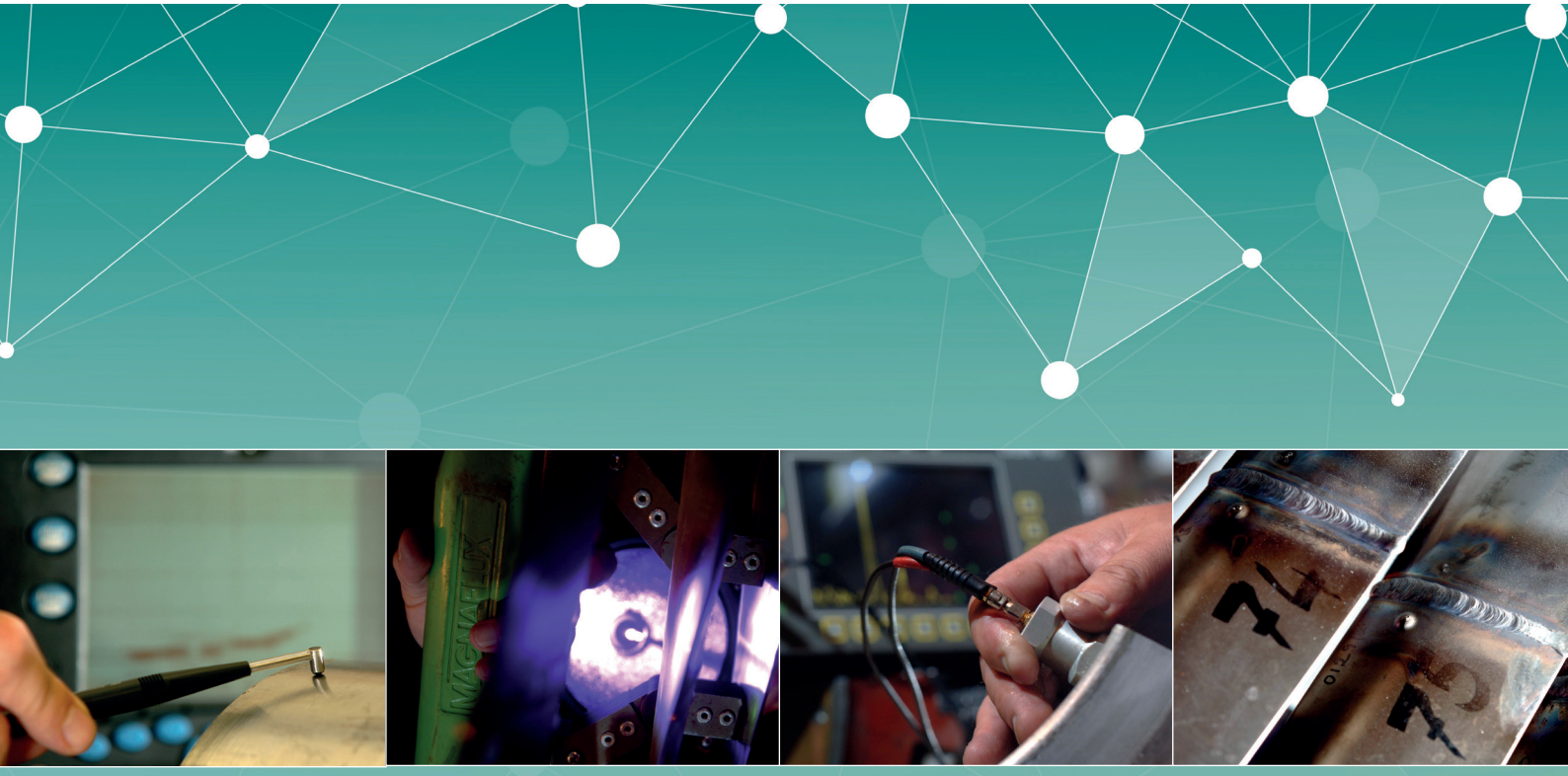
A division of BINDT THE BRITISH INSTITUTE OF NON-DESTRUCTIVE TESTING



Contents

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.

1. Scope

1.1 This document prescribes the specific requirements and procedures by which personnel may be examined and, where successful, certified to use the ultrasonic testing (UT) method for the testing of product types listed within BS EN ISO 9712 at Annex A, specifically A.2.

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

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

1.4 This document relates to all techniques applicable to the UT method, as detailed in BS EN ISO 9712. These are:

i. Manual pulse echo (UT);

ii. Phased array (UT-PA); and

iii. Time-of-flight diffraction (UT-TOFD).

2. Associated documents

2.1 PCN24/GEN: General requirements for qualification and PCN certification of NDT personnel.

2.2 PCN24/AQB/REQ/UT: PCN training/examination and practical testing specimen requirements document for ultrasonic testing (UT) at PCN Levels 1, 2 and 3 (this document is available to AQB examination centres only).

2.3 PCN24/CP09: General requirements for the approval of Authorised Qualifying Bodies (AQBs).

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

2.5 DD CEN/TS 15053:2005: Non-destructive testing – Recommendations for discontinuities-types in test specimens for examination.

2.6 PCN/GEN/Syllabus document.

2.7 PCN/GEN/Specimen questions compendium.

3. Employer responsibilities

3.1 **IMPORTANT:** Candidates and employers shall ensure that they are conversant with the responsibilities ascribed to both the 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.

PCN24/GEN details the specific requirements regarding employer responsibility. It is important that employers are fully aware of their responsibilities. As such, candidates must be aware of the certification privileges and responsibilities awarded to them when PCN certification is issued following success in a PCN examination.

3.2 See PCN24/GEN for further details.

4. PCN UT certification available for single- or multi-sector use

4.1 PCN certification availability (techniques/sectors/materials/levels) is detailed in Table 1 below.

4.2 Table 1 provides a detailed breakdown of all PCN UT certification options available to candidates after successful completion of general and specific NDT method training.

4.3 Detailed sector-specific examination content is included within this document to provide the prospective candidate with guidance and direction when making a considered decision on their eligibility and preparedness prior to making a formal examination application.

Table 1. PCN ultrasonic testing (UT) certification option codes

Technique within the UT method	Certification options within the UT method for the ultrasonic testing of pre- and in-service (which includes manufacturing) products		PCN certification abbreviation	PCN certification level		
				1	2	3
Ultrasonic testing (UT)	Specific UT technologies and certification levels available	Conventional manual UT	UT	✓	✓	✓
		Phased array	UT-PA	–	✓	✓
		Time-of-flight diffraction	UT -TOFD (welds)	✓	✓	✓
	Product sector certification available allied to a specific UT technology	Castings	(c)	✓	✓	✓
		Forgings and wrought products: general forgings/bar/billet/plate	(f-wp)	✓	✓	✓
		Welds (*)	(w)	✓	✓	✓
		Railway products (**)	(r)	✓	✓	✓
		Composites (***)	(m)	✓	✓	✓
UT limited certification	Thickness measurement and lamination testing	Manufactured wrought plate	UT-limited	–	✓	–
Product sector key for welds (*)	Weld Group 3.1 Butt welds in plate	Weld Group 3.2 Butt welds in pipe	Weld Group 3.7 Constructional 'T' joints	Weld Group 3.8 Nozzles and variable configuration welds		
	Weld Group 3.9 Nodes	PCN welds sector certification is single-sector certification only. PCN candidates for 3.7/3.8 and 3.9 must first hold certification for either Weld Group 3.1 or 3.2 or both				
Product sector key for railway products (**)	UT in the rail sector is addressed in a separate suite of PCN examination documents					
Product sector key for composites (***)	The PCN Scheme for the UT of composites is currently under development					
Worked certification examples	**Conventional manual UT – Castings – Level 2** **UT (c) Level 2**		**Conventional manual UT – Welds – 3.1 / 3.2** **UT (w) 3.1/3.2**			

Notes:

1. *Candidates for UT-PA must first hold certification in conventional UT at the appropriate level and in the product sector for which UT-PA is sought. For PAUT in plate and pipe welds, candidates must hold UT welds 3.1 or 3.2 or both. For PAUT in nozzle welds, candidates must hold UT welds 3.8.*
2. *Candidates for UT-TOFD must first hold certification in conventional UT at the appropriate level and in the weld sector. Candidates must hold UT welds 3.1 or 3.2 or both.*

5. Examination eligibility

5.1 Candidates shall provide documentary evidence of acceptable near-vision acuity and colour vision perception in accordance with PCN24/GEN.

5.2 Candidates shall provide documentary evidence of having achieved the required amount of practical industrial experience in accordance with PCN24/GEN.

5.3 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.

6. Examination administration overview

6.1 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 that could be attempted during a PCN examination, dependent upon whether the examination attempted is for initial, recertification, retest or for supplementary certification.

6.2 The 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 AQB. Permissible extensions to examination times are detailed in PCN24/GEN, Section 8.2.

6.3 All additional examination time extensions shall be recorded by the AQB prior to examination commencement.

6.3.1 It is a requirement for candidates to supply the AQB with a medical declaration/attestation from a suitably qualified medical professional confirming the situation. A copy of the declaration/attestation shall be retained within the candidate's examination records file.

7. PCN examination content – Levels 1 and 2 (overview)

7.1 All initial candidates will be required to attempt an examination comprising the following examination elements:

(a) General theory written examination element;

(b) Specific theory written examination element;

(c) Specific practical examination element; and

(d) NDT instruction writing element (Level 2 candidates only).

7.2 Recertification and retest examinations may include some or all of the examination elements listed, dependent upon the candidate's specific examination requirements and as confirmed by individual circumstance. See PCN24/GEN.

7.3 For direct certification under the limited scope options detailed in Table 1 (thickness and lamination testing), candidates shall complete general, specific and practical elements relevant to the limited certification sought. They shall also complete a written instruction element related to the limited scope of testing.

7.4 Renewal, recertification and retest examinations may include some or all of the examination elements listed, dependent upon the candidate's specific examination requirements and as confirmed by individual circumstance. See Section 15 below and PCN24/GEN.

8. General theory examination element (Levels 1 and 2)

8.1 The written examination element to test the candidate's general theoretical knowledge of the ultrasonic testing method. This examination element is closed book (no access to reference materials).

8.2 The general theory examination element is applicable to all UT techniques within the method. For example, candidates holding UT certification need not attempt the general theory paper if adding supplementary advanced UT techniques (UT-PA and/or UT-TOFD).

8.3 40 multiple-choice questions.

8.4 Time allowed per question: 2 minutes.

8.5 Pass mark: 70%.

9. Sector-specific theory examination element (Levels 1 and 2)

9.1 Written examination element to test the candidate's specific theoretical knowledge on the application and use of the ultrasonic testing method within the techniques under examination. This examination element is open book (reference materials may be provided at the discretion of the examination centre/AQB).

9.2 For single-sector UT certification, the specific theory examination shall consist of the following:

(a) For Level 1: a minimum of 25 questions; and

(b) For Level 2: a minimum of 30 questions.

9.3 For multi-sector UT certification, the specific theory examination shall consist of the following:

(a) For Level 1: a minimum of 35 questions; and

(b) For Level 2: a minimum of 40 questions.

9.4 Time allowed per question: 3 minutes.

9.5 Pass mark: 70%.

10. Sector-specific practical examination element (Levels 1 and 2)

10.1 The sector-specific practical examination element requires candidates to demonstrate proficiency in performing tasks that are typical of those to be accomplished during the performance of the candidate's employed duties. This includes testing prescribed practical specimens, recording resulting information to the degree required and reporting the results in the AQB's desired format to meet the requirements of PCN24/CP09.

10.2 All specimens tested shall be sector specific, representing appropriate field geometries and shall contain discontinuities representative of those likely to occur during manufacturing or manifesting during in-service life. Discontinuities may be natural or manufactured/implanted.

10.3 Candidates shall demonstrate use of appropriate equipment and NDT techniques for use within the UT method and technique relevant to the specimens tested for certification sought.

10.4 Pre-use system control and function checks/verification of settings

10.4.1 This part of the practical examination will involve the setting up of UT equipment in accordance with the equipment manufacturer's instructions. The candidate shall complete a calibration exercise to confirm the flaw detector and probe performance are correct and performing within prescribed limits.

(a) The equipment function test and control procedure will be provided to the candidate by the examiner prior to commencement of the test. Additionally, candidates will be required to produce a conventional beam spread diagram for a test centre probe provided to the candidate by the examiner.

(b) The candidate shall document and record in written form the outcome of the equipment's system control and function checks in accordance with the requirements contained within the procedure provided to them by the examiner.

10.4.2 Time allowed: 60 minutes.

10.5 Parent metal lamination checks – Initial PCN candidates – Weld sector only

10.5.1 Initial candidates for PCN UT certification in the weld sector will be required to test a minimum of one parent wrought plate/pipe specimen, reporting on the condition of the material, with particular reference to any laminations and/or inclusions present within the wrought parent plate/pipe specimen tested. This equates to the 'P' category awarded previously. Candidates seeking certification under the limited UT certification detailed in PCN24/LIM/UT/REQ for testing of wrought plate need to test a minimum of two specimens, as detailed in that document.

10.5.2 In addition, candidates shall provide five thickness measurements from specimens of varying thickness. All provided readings shall be within prescribed tolerances.

10.5.3 Both lamination and thickness tests shall be carried out in accordance with written instructions provided to the candidate by the examiner prior to the commencement of the test.

10.5.4 Where the candidate has demonstrated success for the testing of the wrought plate/pipe specimen and for the provision of thickness measurements within specified tolerance bands, they may be awarded lamination testing and thickness measurement on their PCN welds certification.

10.5.5 Time allowed (lamination test): 1 hour.

10.5.6 Time allowed (thickness measurement): 30 minutes.

10.5.7 To pass this prerequisite section, candidates must correctly identify all areas of lamination noted on the AQB master and complete thickness measurements within ±10% of the known AQB master measurements.

10.5.8 Failure in this mandatory prerequisite will prevent the issue of any subsequent weld certification attained until such time that this certification prerequisite is successfully completed.

Note: *PCN certification for thickness checking and lamination mapping was previously available as a separate certification category through ISO 20807. The introduction of BS EN ISO 9712:2022 now allows this certification under BS EN ISO 9712 as UT limited certification (see PCN24/LIM/UT/REQ).*

10.6 Practical testing of specimens

10.6.1 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.

10.6.2 The number of specimens to be tested shall be as advised by the AQB at the time of examination based upon Tables A1-A6 in Annex A, ensuring compliance with BS EN ISO 9712 Annex B. Each specimen shall be different in character, *ie* in product form, material specification, shape, size or discontinuity type.

10.6.3 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.

10.6.4 Candidates will be required to report the results obtained during testing using the AQB's required format.

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

10.6.6 Pass mark: ≥70% for each part of the practical examination, including each individual practical specimen tested or data file interpreted.

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

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

10.6.9 Level 2 candidates shall test prescribed specimens, recording and performing interpretation to the degree required, reporting the results obtained in the AQB's required format.

10.7 NDT instruction writing element – Level 2 candidates

10.7.1 Candidates for Level 2 certification shall be required to draft a detailed written NDT instruction for one of the specimens tested during the practical examination. The specimen shall be selected by the AQB.

10.7.2 This shall be an open-book examination, where candidates are provided with the relevant standard, code or specification, together with a copy of PCN24/CP25, which provides guidance on the content required to be included within the written instruction. This includes the examination element marking scheme for correct allocation of marks.

10.7.3 For the written instruction element, the allowed time shall not be less than 60 minutes and shall not exceed 120 minutes. The actual time permitted shall be advised by the AQB based upon the complexity of the written instruction required.

10.7.4 Mark required to pass: ≥70%.

11. PCN Level 3 candidates – Basic examination

11.1 PCN Level 3 candidates will be required to pass a basic examination before attempting main method examinations.

11.2 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.

11.3 PCN basic examination items/parts are as follows:

11.4 Examination Part A: technical knowledge in materials science and process technology

11.4.1 30 multiple-choice questions (exceeds BS EN ISO 9712).

11.4.2 Time allowed: 2 minutes per question.

11.4.3 Pass mark: ≥70%.

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

11.5.1 Ten multiple-choice questions based upon the contents of PCN24/GEN.

11.5.2 Time allowed per question: 3 minutes per question.

11.5.3 Pass mark: 70%.

11.6 Examination Part C: general knowledge of at least four NDT methods as required for Level 2 certification, at least one method being volumetric from UT or radiographic testing (RT)

11.6.1 15 multiple-choice questions from each method (from a total of 60 possible questions).

11.6.2 Time allowed: 2 minutes per question.

11.6.3 Pass mark: 70%.

11.7 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 ≥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.

11.8 Candidates who hold current valid Level 2 certification shall be exempt from the need to pass the PCN Level 2 practical examination.

12. PCN Level 3 – Main method examination

12.1 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.

12.2 Examination Part D: Level 3 knowledge relating to the test method:

12.2.1 30 multiple-choice questions on the method for certification.

12.2.2 Time allowed: 2 minutes per question.

12.2.3 Pass mark: 70%.

12.3 Examination 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

12.3.1 20 multiple-choice questions based upon the sector for specific certification.

12.3.2 Time allowed: 3 minutes per question.

12.3.3 Pass mark: 70%.

12.4 Examination 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

12.4.1 The recommended time allowed per written procedure is four hours. However, the Certification Body (BINDT) allows the AQB discretion to extend this time period if required.

12.4.2 Pass mark: 70%.

13. Supplementary examinations

13.1 A certified Level 1 or Level 2 individual changing industry or product sector and/or adding another sector for the same NDT method shall be required to take the sector-specific and practical examination elements for the new product sector.

13.2 Candidates for Level 2 certification shall be required to draft a written NDT instruction for the new sector.

Note: *This applies when adding supplementary sectors (ie welds, castings, forgings, etc) to those already held. It does not when adding additional categories within a sector already held (ie additional weld categories 3.7, 3.8, etc).*

13.3 Already certified Level 3 individuals changing or adding another industry or product sector for the same NDT method shall be required to attempt sector-specific items E and F of the main method examination element only.

13.4 It is mandatory for additional practical industrial experience to be demonstrated in accordance with the BS EN ISO:9712 requirements listed below at (a) and (b).

(a) BS EN ISO 9712, section 7.3.3.2 confirms that a certified Level 1, 2 or 3 adding an additional method may be permitted a reduction in the required experience of 25% for that additional method.

(b) BS EN ISO 9712, section 7.3.3.3 requires a certified Level 1, 2 or 3 individual changing product sectors or adding another product sector or technique for the same NDT method to gain additional experience of at least 25% of the experience required in Table 3 and this shall never be less than 15 days in duration.

14. Re-examination

14.1 A candidate who fails one or more elements of an examination (*ie* general, specific, practical, written instruction, procedure writing, etc) may retake the failed examination element no more than twice.

14.2 The re-examination shall only take place after a minimum time period of one month from the date of the original failed examination. This minimum period may be reduced if further training acceptable to the Certification Body has been satisfactorily completed (see PCN24/GEN).

14.3 Any re-examination attempt must take place no later than 12 months after the initial (failed) examination.

14.4 A candidate failing the two allowable re-examinations on one or more elements shall complete further training acceptable to BINDT and then be required to retake all certification examination elements as per the process for initial certification.

15. Renewal and recertification

15.1 BINDT/PCN issues certificates at issue 01 or issue 02. Issue 01 certificates are issued after initial examination or after a five-year or ten-year recertification by examination. Issue 02 certificates are issued following the recertification of an issue 01 certificate by claimed points in accordance with Annex C of this document and BINDT document PCN24/CP16.

15.2 Revalidation of issue 01 certificates is deemed to be a 'renewal'. Revalidation of issue 02 PCN certificates is deemed to be 'recertification'.

15.3 For Level 1 and Level 2 applicants, the renewal/recertification examination shall consist of the practical element detailed below and additionally, for Level 2, the completion of the written instruction element.

15.4 Levels 1 and 2 (five-year renewal of issue 01 certificates by claimed points)

15.4.1 Prior to the completion of the period of validity following certification and recertification, renewal of certification for a further period shall be by application to BINDT/PCN using form PCN24/CP16. The applicant is required to provide the following:

(a) A completed PCN24/CP16 form;

(b) Documentary evidence of a satisfactory near-vision acuity examination taken within the preceding 12 months;

(c) Documentary evidence of a satisfactory colour vision and/or greyscale perception examination taken within the preceding 60 months; and

(d) Verifiable documentary evidence of continued satisfactory work activity without significant interruption in the method and sector for which certificate renewal is sought. See Annex C for guidance on claiming renewal by points.

15.5 Levels 1 and 2 – Renewal of issue 01 or issue 02 certificates by re-examination)

15.5.1 The PCN certificate holder shall apply by submission of a completed PCN24/PSL57A form directly to the AQB.

15.5.2 For renewal or recertification by examination, the candidate shall attempt a practical examination as detailed in 15.5.3 below. For Level 2 renewals by examination or recertification, the candidate is also required to complete the written instruction element of the examination.

15.5.3 For renewal or recertification by examination, the candidate shall achieve a pass grade of 70% for each specimen attempted (and for Level 2, the written instruction). Candidates who fail to achieve a pass grade of 70% for each specimen attempted and/or the written instruction (at Level 2) are allowed two retests of the failed element, which shall consist of the practical testing element and/or written instruction element of the examination (at Level 2) depending upon the individual elements failed.

15.5.4 For renewal examinations (issue 01 certificates), the candidate is required to complete a practical element as detailed in Tables A1-A6 in Annex A. The minimum practical element content shall be as follows (minimum):

(a) For renewal certification in the welds sector, the candidate will test one specimen from each weld category in which renewal is sought and in which certification is currently held. The time allowed will be 2.5 hours per sample tested. The minimum pass mark for the practical part is 70% in each sample tested;

(b) For renewal certification in the castings sector, the candidate will test two specimens from the product sector concerned; and

(c) For renewal certification in the wrought products/forgings sector, the candidate will test one specimen from each of the product sectors concerned, unless the forging sector is attempted in isolation when two specimens shall be tested.

15.5.5 For recertification examinations (issue 02 certificates), the practical element shall be the same as for initial examination.

15.5.6 Any retest of the practical testing element shall require the candidate to re-attempt the full practical element equivalent to that attempted during the failed renewal or recertification examination. The retests shall take place after seven days and within six months of the initial date of the failed renewal or recertification examination.

Note 1: *Level 3 certificate holders renewing their Level 2 practical certification in support of their Level 3 certificate need not complete a written instruction as part of the recertification process.*

15.5.7 In the event of final failure in a renewal or recertification examination, BINDT will immediately cancel the certificate concerned, issuing a new record of certification that no longer shows the competence concerned and sending this with an explanatory letter to the certificate holder requesting the return of the superseded record of certification which is a mandatory requirement.

15.5.8 In the event of failure in the two allowable retests, the certificate shall not be revalidated and, to regain certification for that level, sector and method, the candidate shall reapply for certification as an initial candidate. For Level 1 and 2, no examination exemptions shall be awarded by virtue of any other valid/recognised certification held.

15.6 Level 3 (five-year renewal)

15.6.1 The procedure for renewal and recertification of PCN Level 3 certificates is detailed in PCN document PCN24/CP16.

15.6.2 The PCN certificate holder shall apply by submission of a completed PCN24/PSL57A form directly to the AQB (for renewal by examination) and directly to BINDT (for renewal by points).

15.6.3 For all Level 3 renewals/recertifications, the individual may decide between the examination or credit system for recertification. If the credit system is chosen and requires submission of employer's documents or access to an employer's premises, the individual shall provide to the certification body a written statement of approval from the employer.

15.6.4 In both cases (written examination or credit system), the individual shall either provide appropriate documented evidence, acceptable to the Certification Body, of his/her continued practical competence in the method or pass a Level 2 practical examination, as specified, except for the drafting of NDT instructions.

15.6.5 A candidate who does not meet the requirements of the Level 3 recertification by the structured credit system (PCN24/CP16) shall recertify by examination. In the event of failure at the first attempt at recertification by examination, only one retest of the recertification examination shall be allowed within 12 months of the date of application for recertification via the PCN24/PSL57A form.

15.6.6 For candidates who proceed directly to the recertification exam process. In the event of failure in the two allowable retests, the certificate shall not be revalidated and, to regain certification for that level, sector and method, the candidate shall apply for certification as an initial candidate. For Level 3, the candidate shall be required to achieve success in the appropriate main method examination.

ANNEX A – GUIDANCE ON MINIMUM PRACTICAL EXAMINATION SPECIMEN QUANTITIES TO BE ATTEMPTED

The Tables below give details on the minimum number of practical component specimens or associated data that a candidate will be expected to attempt in the varying examination types (initial, renewal and recertification) as applicable to the individual ultrasonic testing techniques within the varying product sectors.

Table A1. Minimum number of specimens to be attempted in manual UT of castings

Initial notes:

1. *This Table refers to the required practical element for manual UT testing of castings. The candidate will be subject to other examination elements as detailed in PCN24/GEN and within this document as applicable to the examination type being undertaken.*
2. *Level 1 candidates shall practically test and provide thickness measurements and attenuation readings as detailed in the Table below.*
3. *Level 2 candidates shall practically test and report on actual physical casting specimens.*
4. *Renewal of issue 01 certificates may be achieved by claimed points in accordance with PCN24/CP16 or by the examination route which includes the practical testing of specimens, as detailed in the Table below.*
5. *Recertification of issue 02 certificates at Level 2 also requires the candidate to complete the written instruction examination element as per the requirements for initial certification.*

Component type	Additional information	Initial examination		Renewal by examination (issue 01 certificates)		Recertification examination (issue 02 certificates)	
		Minimum number of practical specimens to be attempted					
		Level 1	Level 2	Level 1	Level 2	Level 1	Level 2
Castings	Ultrasonic thickness measurements on cast materials	8	–	4	–	8	–
	Attenuation measurements using cast material	2	–	1	–	2	–
	Castings specimens	–	4	–	2	–	4

Notes:

1. *Failure to achieve the pass criteria in any part of the practical element will result in an overall examination failure. All re-attempts following examination failure will require the re-administration of the full practical examination.*

Table A2. Minimum number of specimens to be attempted in manual UT of wrought products and forgings

Initial notes:

1. *This Table refers to the required practical testing examination element for the manual UT testing of wrought products and forgings. Candidates may be subject to other PCN examination elements as detailed in PCN24/GEN dependent upon the certification sought (initial, recertification, retest, etc).*
2. *The two examination options available are:*
   (a) Wrought products (bar, billet, plate); and
   (b) Wrought products (bar, billet, plate) and general forgings.
3. *Renewal of issue 01 certificates may be achieved by claimed points in accordance with PCN24/CP16 or by the examination route which includes the practical testing of specimens detailed in the Table below.*
4. *Recertification of issue 02 certificates at Level 2 requires the candidate to complete the written instruction examination element as per the requirements for initial certification.*

Component type	Additional information	Initial examination		Renewal by examination (issue 01 certificates)		Recertification examination (issue 02 certificates)	
		Minimum number of practical specimens to be attempted					
		Level 1	Level 2	Level 1	Level 2	Level 1	Level 2
Wrought products (option A)	Bar	1	1	1	1	1	1
	Billet	1	1	1	1	1	1
	Plate	1	1	1	1	1	1
Wrought products and forgings (option B)	Bar	1	1	1	1	1	1
	Billet	1	1	1	1	1	1
	Plate	1	1	1	1	1	1
	Forging	1*3 (2*4)	1*3	1	1	1*3	1*3

Notes designated by an asterisk in the Table above:

*1. *Candidates for multi-sector certification must attempt a minimum of one specimen from each product sector. This applies to initial, renewal and recertification examinations as the proving of competence in the testing of all three product types is essential in all examination types.*

*2. *Failure to achieve the pass criteria in any bar, billet or plate specimen during either examination option will result in an overall examination failure. All re-attempts following examination failure will require the re-administration of the full practical examination.*

*3. *Failure to achieve the pass criteria in any forging specimen during examination option (B) 'bar, billet, plate and forgings' will result in the candidate being awarded the option (A) 'certification (bar, billet, plate only)' providing those specimens are successfully completed. In such instances, the candidate may re-attempt the forging sector by attempting one additional forging specimen in the re-attempt examination.*

*4. *Candidates holding certification for bar, billet and plate may add the forging product sector by completing two forging specimens for initial certification.*

Table A3. Minimum number of specimens to be attempted in manual UT of welds for the varying examination types

Initial notes:

1. *This Table should be read in conjunction with Table 1 of this document (Table 1 of PCN24/AQB/REQ/UT).*
2. *This Table refers to the testing of weld specimens within the practical element of the examination type being attempted. Candidates will be subjected to other examination elements as detailed in PCN24/GEN and within this document as applicable to the examination type being undertaken.*
3. *Eligibility to attempt initial certification examinations in categories 3.7, 3.8 and/or 3.9: candidates must first hold valid certification in either category 3.1* ***OR*** *3.2.*
4. ***The minimum number of practical examination specimens to be attempted shall be two to comply with BS EN ISO 9712 Annex B.*** *Where a single category is attempted in isolation (butt welds in plate, for example) then the minimum number of specimens to be tested shall be two butt welds in plate. The only exemption to this requirement is in the node (3.9) category where only one specimen is required.* ***Note:*** *the Table below is specific to multi-category examinations.*
5. *Renewal of issue 01 certificates may be achieved by claimed points in accordance with PCN24/CP16 or by the examination route which includes the practical testing of specimens detailed in the Table below.*
6. *Recertification of issue 02 certificates at Level 2 requires the candidate to complete the written instruction element as per the requirements for initial certification.*

Weld type (group)	Category	Subcategories	Additional information	Initial examination	Renewal by examination (issue 01 certificates)	Recertification examination (issue 02 certificates)
				Minimum number of practical specimens to be attempted		
Butt welds in plate	3.1	3.1.2	Deposited from one side of plate (w/t 6-15 mm)	2*1	1	1
		3.1.3	Deposited from both sides of plate (w/t > 15 mm)			
		3.1.4	Deposited from both sides of plate (w/t > 15 mm)			
Butt welds in pipe	3.2	3.2.1	OD 50-105 mm (w/t 6-15 mm)	2*2	1	1
		3.2.5	OD > 105 mm (w/t 6-15 mm)			
		3.2.7	OD > 105 mm (> 15 mm)			
Constructional 'T' joints	3.7	3.3.2	Full-penetration 'T' joints	2*3	1	1
		3.4.2	Partial-penetration 'T' joints			
Nozzles and variable configuration	3.8	3.3.1	Full-penetration nozzles	2*4	1	1
		3.4.1	Partial-penetration nozzles			
Nodes	3.9	3.9	Full-penetration nodes	1	1	1

****Notes designated by an asterisk in the Table above:***

**1. Candidates for certification in butt welds in plate 3. will be required to practically test a minimum of two specimens from within the three subcategories detailed in the Table above. The selection of specific categories in this group shall be at the discretion of the examination centre.*

**2. Candidates for certification in pipe welds 3.2 will be required to complete an examination consisting of a minimum of two specimens comprising one specimen from subcategory 3.2.1 and one specimen from subcategory 3.2.5 or subcategory 3.2.7.*

**3. Candidates for certification in constructional 'T' joint welds 3.7 will be required to practically test a minimum of two specimens. One specimen from subcategory 3.3.2 and one specimen from subcategory 3.4.2.*

**4. Candidates for certification in nozzle and variable-geometry welds 3.8 will be required to practically test a minimum of two specimens. One full-penetration specimen from subcategory 3.3.1 and one partial-penetration specimen from subcategory 3.4.1. Both specimens shall be of variable geometry. Successful completion of this group provides candidates with an exemption from Group 3.7 constructional 'T' joints, which the candidate will be awarded automatically.*

Table A4. Minimum number of specimens to be attempted in phased array UT (UT-PA) – Welds only

Initial notes:

1. *This certification is not available at Level 1.*
2. *This Table refers to the UT-PA testing of weld specimens within the practical element of the examination type being attempted. The candidate will be subjected to other examination elements, as detailed in PCN24/GEN and within this document as applicable to the examination type being undertaken.*
3. *In order to be eligible to attempt initial examinations in any UT-PAUT (welds) category, the candidate must hold current certification for the manual UT of welds in category 3.1 or 3.2 or both.*
4. *In order to be eligible to attempt initial examinations in category 3.8, candidates must hold valid UT-PA certification in plate/pipe welds.*
5. *Renewal of issue 01 certificates may be achieved by claimed points in accordance with PCN24/CP16 or by the examination route which includes the practical testing of specimens as detailed in the Table below.*
6. *Recertification of issue 02 certificates at Level 2 requires candidates to complete the written instruction element of the examination as per requirements for initial certification.*
7. *Candidates shall practically test examination specimens provided to them by the examination centre, collecting the required data for further interpretation and, where necessary, sentencing. Data acquisition and data interpretation are fundamental parts of the practical examination.*

Weld type (group)	Category	Additional information	Initial examination	Renewal by examination (issue 01 certificates)	Recertification examination (issue 02 certificates)
			Minimum number of practical specimens to be attempted		
Butt welds in plate/pipe	3.1 and 3.2	Plate or pipe welds from weld categories as selected by the AQB	3*1	2	3*1
Nozzles and variable configuration	3.8	Full-penetration nozzles	1*2	1	1
		Partial-penetration nozzles	1*2	1	1

Notes designated by an asterisk in the Table above:

*1. *Candidates for certification in plate/pipe welds 3.1 will be required to complete an examination consisting of a minimum of three plate or pipe specimens selected by the AQB. The selection of specific categories in this group shall be at the discretion of the examination centre. The one certification covers both plate and pipe welds as the practical testing techniques are similar. The examination specimens are selected at the discretion of the examination centre and do not necessarily need to include both plate and pipe welds.*

*2. *Due to the added complexity of testing nozzle welds using UT-PA, a supplementary examination is required to add the 3.8 category. Candidates for certification in the 3.8 category must already hold current certification in UT-PA of plate and pipe welds in order to be eligible for the supplementary 3.8 category.*

Table A5. Minimum number of specimens to be attempted in phased array UT (UT-PA) – Multi-sector

Initial notes:

1. *This certification is not available at Level 1.*
2. *This Table refers to the UT-PA testing of weld specimens within the multi-product sector covering welds, castings and wrought products. The candidate will be subject to other examination elements, as detailed in PCN24/GEN and within this document as applicable to the examination type being undertaken.*
3. *Renewal of issue 01 certificates may be achieved by claimed points in accordance with PCN24/CP16 or by the examination route which includes the practical testing of specimens as detailed in the Table below.*
4. *Recertification of issue 02 certificates at Level 2 requires candidates to complete the written instruction examination element as per the examination requirements for initial certification.*
5. *Candidates are required to practically test examination specimens provided by the examination centre, collecting the required data for further interpretation and, where necessary, sentencing. Data acquisition and data interpretation are fundamental parts of the practical examination.*

Component type	Additional information	Initial examination	Renewal by examination (issue 01 certificates)	Recertification examination (issue 02 certificates)
		Minimum number of practical specimens to be attempted		
Butt welds in plate/pipe	Plate or pipe welds from weld categories as selected by the AQB	1	1	1
Castings	–	1	1	1
Wrought products	–	1	1	1

Notes:

1. *Candidates for multi-sector UT-PA certification must attempt a minimum of one specimen from each product sector. This applies to initial, renewal and recertification examinations, as the proving of competence in the testing of all three product types is essential in all examination types.*
2. *Failure to achieve the pass criteria in any specimen or product type during the examination will result in an overall examination failure. All re-attempts following examination failure will require the re-administration of the full practical examination.*

Table A6. Minimum number of specimens to be attempted in UT time-of-flight diffraction (UT-TOFD) – Welds only

Initial notes:

1. *This certification is not available at Level 1.*
2. *In order to be eligible to attempt initial PCN examinations in the UT-TOFD technique, the candidate must hold current certification for the manual UT of welds in category 3.1 or 3.2 or both.*
3. *This Table refers to the UT-TOFD testing of weld specimens in the practical element of the examination type being attempted. Candidates will be subject to other examination elements, as detailed in PCN24/GEN and within this document as applicable to the examination type being undertaken.*
4. *Renewal of issue 01 certificates may be achieved by claimed points in accordance with PCN24/CP16 or by the examination route which includes the practical testing of specimens detailed in the Table below.*
5. *Recertification of issue 02 certificates at Level 2 also requires the candidate to complete the written instruction examination element as per the requirements for initial certification.*
6. *Candidates are required to scan the examination specimens provided by the examination centre, testing their competence in the use of the equipment and collecting the required data for interpretation. In addition to the data acquisition part of the practical examination, the candidate is also required to interpret data files selected by the examination centre. Data acquisition and data interpretation are fundamental parts of the practical examination.*

Component type	Examination part	Initial examination		Renewal by examination (issue 01 certificates)		Recertification examination (issue 02 certificates)	
		Minimum number of practical specimens to be attempted					
		Level 1	Level 2	Level 1	Level 2	Level 1	Level 2
Welds	Assembly and calibration of TOFD data acquisition equipment	✓	✓*1	✓	–	✓	–
	Collecting TOFD data from linear butt welds in accordance with written instructions	2	–	1	–	2	–
	Examine and evaluate the data collected to determine its suitability for interpretation or whether further scans are required	✓	–	✓	–	✓	–
	Test collect and store test data for linear weld specimens	–	2*2	–	2	–	2
	Interpret and report on recorded weld scan data files representative of a range of TOFD inspections	–	5	–	3	–	5

Notes designated by an asterisk in the Table above:

**1. Candidates holding UT-TOFD Level 1 are exempt this part of the practical element.*

**2. Candidates holding current Level 1 TOFD certificates will be required to attempt only one specimen.*

**3. Failure to achieve the pass criteria in any part of the practical element will result in an overall examination failure. All re-attempts following examination failure will require the re-administration of the full practical examination.*

16. Change control record

PCN24/GEN/APP/UT – Document issue and review status		
Document issue for review	**Changes/amendments**	**Current document status**
Issue 01	New Appendix document – Candidate facing UT document in support of PCN24.	1 January 2025 (for comment).

Issued by Certification Services Department, The British Institute of Non-Destructive Testing
Midsummer House, Riverside Way, Bedford Road, Northampton NN1 5NX, United Kingdom
Tel: +44 (0)1604 438300 | Email: pcn.enquiries@bindt.org | www.bindt.org/certification