



CERTIFICATION SCHEME FOR PERSONNEL

DOCUMENT No. CSWIP-ISO-NDT-11/93-R

Requirements for the Certification of Personnel Engaged in Non-Destructive Testing in accordance with the requirements of ISO 9712

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Issued under the authority of the Governing Board for Certification
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CSWIP is administered by TWI Certification Ltd
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Accreditation Certificate No 25

FOREWORD

The Certification Scheme for Personnel (CSWIP) is a comprehensive scheme which provides for the examination and certification of individuals seeking to demonstrate their knowledge and/or competence in their field of operation. The scope of CSWIP includes Welding Inspectors, Welding Supervisors, Welding Instructors, Welding Examiners, Welding Quality Control Coordinators, Heat Treatment Operatives, Cathodic Inspection personnel, Drillstem Inspection personnel, Plant Inspectors, Underwater Inspection personnel, plastics welders and NDT personnel.

CSWIP is managed by the Certification Management Board, which acts as the Governing Board for Certification, in keeping with the requirements of the industries served by the scheme. The Certification Management Board, in turn, appoints specialist Management Committees to oversee specific parts of the scheme. All CSWIP Boards and Committees comprise member representatives of relevant industrial and other interests. TWI Certification Ltd is accredited by UKAS to ISO 17024(1).

TWI Certification Ltd understands the importance of impartiality in carrying out its certification activities, managing conflict of interest and ensuring the objectivity of all its certification activities, in accordance with BS EN ISO/IEC 17024.

ACCESS TO CERTIFICATION

Access to certification is not improperly restricted. The sole criteria for certification are given in this document (and any subsequent amendments) and no other criteria will be applied. Certification is not conditional on the candidate applying for other services or membership from TWI Certification Ltd, its parent, or any other groups or associations.

1 General

This document prescribes procedures by which personnel may be examined and, if successful, certificated for; ultrasonic testing (including automated testing), magnetic testing, liquid penetrant testing, visual and optical testing, radiographic testing and/or radiographic interpretation as applied to welded joints and /or castings and wrought components (including forgings).

The requirements for examination eligibility, examination format and the rules governing certificate validity and renewal are, as a minimum, in compliance with ISO 9712(2).

The competence assessment and assurance provided within this scheme document are designed to satisfy the guidance expressed in RG 0 "Guidelines on the competence of personnel undertaking engineering inspections". Product sectors and industrial sectors are named, where applicable, in the CSWIP Inspector certification titles, roles and responsibilities.

Job specific training, as defined in ISO 9712 Clause 3.13, may be provided within the requirements of Document CSWIP ES-NDT-12-04.

2 Scope

Certification comprises three parts:

- i) General (theory and practical common to all applications of a particular method of NDT)
- ii) Sector specific (theory and practical for the method related to a specific application – in the present case this is welds made by conventional fusion welding processes, castings and or wrought products including forgings).
- iii) Job specific (examination related to the special needs of an individual employer – the examination is conducted by or on behalf of the employer).

General and sector specific examinations are conducted by, or under the control of, an Examining Body authorised by TWI Certification Ltd.

The present requirements are intended to meet the majority of users' needs for the practical non-destructive testing of welds, castings and wrought products (including forgings) and to provide industry with an assured minimum standard of proficiency. The majority of users of independent certification find the general and sector specific examinations sufficient for their needs, and do not require job specific examinations. The specialist user may add job specific examinations related to their own particular needs.

Level 1, 2 and 3 personnel are covered by these requirements.

2.1 NDT Level 1 personnel

An individual certified to Level 1 has demonstrated competence to carry out NDT operations in the method and sector described, and in accordance with written instructions under the supervision of Level 2 or 3 personnel. The individual has, under assessment, demonstrated the ability to set up the equipment, carry out the tests, record the results obtained, classify the results in accordance with written criteria and report the results. The responsibilities of a Level 1 do not include choice of the test method or technique to be used, and the assessment of test results.

2.2 NDT Level 2 personnel

An individual certified to NDT Level 2 has demonstrated competence to perform and direct non-destructive testing in accordance with established or recognised techniques in the method and sector described. The individual has, under assessment demonstrated the ability to choose the test techniques to be used; to set up and calibrate equipment; to interpret and evaluate results in accordance with applicable codes, standards and specifications; to carry out all duties for which a Level 1 individual is certified and to check that they are properly executed; and to translate NDT codes, standards, specifications and procedures into NDT instructions and organise and report the results of non-destructive tests. The individual has also demonstrated the ability to be familiar with the scope and limitations of the method for which they are certified, and be able to exercise assigned responsibility for on-the-job training and guidance of trainees and NDT Level 1 personnel.

2.3 NDT Level 3 personnel

An individual certified to NDT Level 3 has demonstrated the capability of assuming full responsibility for a test facility and staff; establishing techniques and procedures; interpreting codes, standards, specifications and procedures; and designating the particular test methods, techniques and procedures to be used. To develop NDT procedures adapted to problems which are the subject of an NDT specification. The individual has, under assessment demonstrated the ability to interpret and evaluate results in accordance with existing codes, standards and specifications and have sufficient practical background in applicable materials, fabrication and product technology to select methods and establish techniques and to assist in establishing acceptance criteria where none are otherwise available. The individual has also demonstrated under assessment general familiarity with other NDT methods and has the ability to train Level 1 and Level 2 personnel.

3 Eligibility for Examination

Candidates shall have a combination of education, training and experience adequate to ensure that they have the potential to understand the principles and procedures of the applicable NDT method.

3.1 Training

3.1.1 Levels 1 and 2

To be eligible for certification in any NDT method, the candidate shall provide evidence of successful completion of a training programme approved by TWI Certification Ltd in that method. As a guide the minimum, training hours required are:

NDT Method	Training Hours		
	Level 1	Level 2	Level 3*
Liquid penetrant testing (PT)	16	24	24
Magnetic testing (MT)	16	24	32
Radiographic interpretation (RI)	-	56	-
Radiographic testing (RT)	40	80	40
Digitised radiographic interpretation (DRI)	-	12	-
Digitised radiographic testing (DRT)	12	24	-
Ultrasonic Inspector (conventional) (UT)	40	80	40
Ultrasonic Corrosion & Erosion Monitoring Endorsement (UCM)	-	40	-
Electromagnetic Acoustic Transducer (EMAT) Inspection Corrosion & Erosion endorsement	-	40	-
Automated Ultrasonic Inspector (AUT)	40	80	-
Automated Ultrasonic Data Interpreter (AUTDI)	-	40	-
Phased			
Array Ultrasonic Inspector (PAUT)	80	24	22
Phased Array Corrosion & Erosion Monitoring Endorsement (PACM)	-	40	-
Phased Array Data Analysis	-	80	-
Critical Sizing Endorsement (CSE)	-	40	-
Guided Wave Testing (GWT)	80	40	40
TOFD Ultrasonic Testing	40	40	40
TOFD Data Analysis	-	80	-
Visual and optical testing (VT)	16	24	24
ACFM (ET)	40	48	48
Eddy Current testing (EC)	40	48	48
Eddy Current Array	-	40	-
Ultrasonic Thickness Measurement and Monitoring (UTMM)	40	80 (direct entry)	-
Radiation Safety (RS)	16	24	-
Leak Testing (LT)	24	40	40

* Level 3 candidates who hold current EN 473/ISO 9712 Level 2 in a given method, the training duration may be reduced by up to 50%.

Notes:

- 1 On the job training can account for one-third of the total training hours.
- 2 Direct access to Level 2 requires the total hours for Level 1 and Level 2 except ultrasonic thickness measurement.
- 3 The critical sizing endorsement is only available to holders of the phased array ultrasonic inspection.
- 4 The Phased array corrosion and erosion monitoring endorsement is only available to holders of the phased array ultrasonic inspection Level 2.
- 5 The Ultrasonic corrosion and erosion monitoring endorsement is only available to holders of conventional ultrasonic inspection Level 2.
- 6 The Electromagnetic Acoustic Transducer corrosion and erosion inspection endorsement is only available to holders of conventional ultrasonic inspection Level 2.
- 7 The Eddy Current array endorsement is only available to holders of conventional Eddy Current Inspection Level 2.

- 8 Candidates who hold a Level 1 Phased Array Ultrasonic Inspection, the training duration may be reduced by up to 50% for Phased Array Data Analysis.
- 9 Candidates who hold a Level 1 TOFD Inspection, the training duration may be reduced by up to 50% for the TOFD Data Analysis.

Candidates must provide evidence of training. A certificate of attendance and a copy of the training syllabus, both authenticated by a senior responsible person in the candidate's employing organisation or by a major client, will normally suffice.

Note:

- 1 Evidence of training must satisfy the requirements of ISO 9712 and any technique or sector specific requirements in this document.

3.2 Experience

3.2.1 Levels 1 and 2

To be eligible for certification, the candidate shall have the minimum experience indicated below in the method in which they are seeking certification:

NDT Method	Months of Experience	
	Level 1	Level 2
Liquid penetrant testing (PT)	1	3
Magnetic testing (MT)	1	3
Radiographic interpretation (RI)	N/A	6
Radiographic testing (RT)	3	9
Digitised radiographic interpretation (DRI)	N/A	3
Digitised radiographic testing (DRT)	1	3
Ultrasonic testing (conventional) (UT)	3	9
Ultrasonic Corrosion & Erosion Monitoring Endorsement (UCM)	N/A	3
Electromagnetic Acoustic Transducer (EMAT) Inspection		
Corrosion & Erosion endorsement	N/A	3
Automated Ultrasonic Inspector (AUT)	3	9
Automated Ultrasonic Data Interpreter (AUTDI)	N/A	3
Phased Array Ultrasonic Inspector (PAUT)	3	3
Phased Array Corrosion Monitoring Endorsement (PACM)		3
Phased Array Data Analysis	N/A	3
Critical Sizing Endorsement (CSE)	N/A	3
Guided Wave Testing (GWT)	0	6
TOFD Ultrasonic Testing	1	3
TOFD Data Analysis		3
Visual and optical testing (VT)	1	3
ACFM (ET)	3	9
Eddy current testing (EC)	3	9
Eddy Current Array	N/A	3
Ultrasonic thickness measurement and Monitoring (UTMM)	1	4
Radiation safety (RS)	0	6
Leak Testing (LT)	3	9

For the Senior Automated Ultrasonic Girth Weld Inspector, Level 2 Inspector, twelve months automated UT experience is required, plus an EN 473/ISO 9712 Ultrasonic Inspector 3.1 or 3.2 or a Level 1 Automated Ultrasonic Girth Weld Operator or Automated Ultrasonic Data Interpreter is required, see Appendix 1, Part 1b.

For the Phased Array and Time of Flight Diffraction Ultrasonic Inspection Level 2, three months experience is required, plus an EN 473/ISO 9712 Ultrasonic Inspector 3.1 or 3.2, see Appendix 1, Part 1b.

For PAUT, AUT, AUTDI and TOFD operators who do not hold EN 473/ISO 9712 Level 2 certification in ultrasonic inspection a general theory ultrasonic paper of 40 multiple choice questions must also be successfully completed.

For Automated Ultrasonic Inspection Level 3, candidates must hold:

- A valid Automated Ultrasonic Inspector Level 1 and Automated Ultrasonic Data Interpreter in accordance with ISO 9712 for a minimum of 2 years

and

- are required to have a good understand of TOFD and Phased Array Ultrasonic Inspection, this can be demonstrated by holding an ISO 9712 Phased Array Ultrasonic Inspection Level 2 and TOFD Level 2

or

- By candidates successfully completing a 20 multiple choice specific question paper on TOFD and PAUT (this can be taken after undertaking either an appreciation course or following completion of an approved distance learning package).

For the Computed Radiographic certification, an ISO 9712 Level 2 or Level 3 radiographic testing certification shall be held by the candidate as required.

For radiographic testing certification, candidates who do not hold a valid BRS or RPS certificate with a validity of at least four years will be required to successfully sit the CSWIP BRS examination prior to undertaking the CSWIP radiographic testing examination.

Industrial NDT experience may be acquired prior to or following success in the examination. In the event that the experience is sought following successful examination, the results of the examination shall remain valid for two years.

The industrial NDT experience must be supervised by an individual certified in accordance with ISO 9712 in the relevant method and sector at a minimum of Level 2 or ASNT-ACCP Level 3, or responsible welding coordinator in accordance with ISO 3834-2 or ISO 3834-3.

Notes:

Work experience in months is based on a nominal 40h/week (160 h/month). When an individual is working more than 40h/week, they may be credited with experience based on the total hours, but they shall be required to produce evidence, of this experience.

If the individual is being qualified directly to Level 2, with no time at Level 1, the experience shall consist of the sum of the hours required for Level 1 and Level 2. Credit for work experience may be gained simultaneously in two or more complementary NDT methods with the reduction in total required experience as follows:

- a) two testing methods – reduction of total required time by 25%
- b) three testing methods – reduction of total required time by 33%
- c) four testing methods – reduction of total required time by 50%

In such cases the division of time between the methods must be approximately the same ratio as the original experience required for each method.

The candidate shall be required to show that, for each of the testing methods for which they seek certification, they have acquired at least half of the experience requirement shown in the table above.

Candidates must provide evidence of experience by providing relevant information authenticated by a senior responsible person in the candidate's employing organisation or by a major client.

3.2.2 Level 3

Level 3 responsibilities require knowledge beyond the technical scope of any specific NDT method. This broad knowledge may be acquired through a variety of combinations of education, training and experience. The table below details minimum experience related to formal education.

	Education	Experience (months)
Access to Level 3 by a certified Level 2 operator	Graduate of at least three years accredited science or engineering college or university programme	18
	Successful completion of at least two years of engineering or science study at an accredited college, university or technical school	24
	No degree	48
Direct access to Level 3 by a non-certified operator with experience equivalent to Level 2 (The candidate shall have successfully completed the practical examination for Level 2 in that NDT method)	Graduate of at least three years accredited science or engineering college or university programme	30
	Successful completion of at least two years of engineering or science study at an accredited college, university or technical school	48
	No degree	72
<p>Note – If the college or university degree is issued in non-destructive testing the experience required for access to Level 3 may be reduced by 50%.</p> <p>Work experience for Level 3 certification shall consist of time as a certified Level 2 operator. For direct access without a Level 2 certificate, the candidate shall have worked on a level comparable to that of a Level 2 in the period stated.</p> <p>Credit for work experience may be gained simultaneously in two or more of the NDT methods covered by this European Standard, with the reduction of total required experience as follows:</p> <ul style="list-style-type: none"> – two testing methods – reduction of total required time by 25%; – three testing methods – reduction of total required time by 33%; – four or more testing methods – reduction of total time by 50% <p>In all cases the candidate shall be required to show that, for each of the testing methods for which he seeks certification, he has at least half of the time required as shown above.</p>		

3.3 Mature candidate route

A mature candidate route offering exemption from the formal training is available for candidates who are able to demonstrate having at least five years recent experience in their chosen method and can show documented evidence of having completed a course of training compliant with provision of the relevant CSWIP syllabus. Training courses completed shall be approved by CSWIP prior to the examination.

If a mature candidate is unsuccessful in obtaining certification it will be necessary to undertake an approved course followed by a full re-examination.

3.4 Vision requirements

The candidate shall provide documented evidence of satisfactory vision in accordance with the following requirements:

- a) Unaided or corrected near visual acuity in at least one eye shall be such that the candidate is capable of reading N4.5 Times Roman or Jaeger number 1 or equivalent letters (having a height of 1.6mm) type at a distance of not less than 30cm with one or both eyes on a standard reading test chart or should be conducted in accordance with BS EN ISO 18490:2015, Non-destructive testing – Evaluation of visual acuity of NDT personnel, using the “tumbling E” chart.
- b) Colour vision shall be sufficient that the candidate can distinguish and differentiate contrast between the colours or shades of grey used in the NDT methods concerned. All candidates and holders of CSWIP certification will be required to have a colour perception assessed by the Ishihara 24 plate test, in the event of colour perception deficiency, indicated by misreading any of the first 17 plates, the employer shall be notified, a further ‘trade test shall be carried out by the employer to ascertain whether the detected colour perception deficiency affects the individuals ability to perform the NDT method for which he is certified.

The evidence must be in the form of a certificate issued by a medically recognised person or a trained appointed representative of the medically recognised person within the previous 12 months, covering all the above points.

With all the above eligibility requirements the onus is on the candidate to provide the necessary evidence prior to examination. An examination appointment will not be confirmed until the evidence has been received. Subsequent to certification, tests of visual acuity shall be carried out annually.

Personnel who satisfy most but not all of the other entry requirements and who may have alternative attributes which they consider should be taken into account may have their individual cases assessed by the appropriate CSWIP Management Committee. Such applications should be directed to TWI Certification Ltd in the first instance.

4 Application for Examination and Fees

When the eligibility for examination has been achieved, the next step is to take the examination.

Candidates will be required to submit an application form. All the information requested must be on these forms. No applications can be considered confirmed until receipt of correctly completed documents. Application forms ask for specific details of experience and training, and require commitment to the CSWIP Rules, and must be signed to the effect that these details are correct.

In the event of a false statement being discovered on forms any examination undertaken will be declared null and void. A certificate is automatically invalidated if there are any outstanding examination fees in respect of that certificate.

Candidates proved to have cheated, or found to have attempted to remove or found to have removed examination material in a CSWIP examination will not be accepted as a candidate for any CSWIP examination for a minimum period of five years from the date of the examination where cheating, attempt to remove or remove all of examination material, was established to have taken place.

Examinations may be taken at any one of a number of Test Centres in the UK and overseas. Lists are available on request.

5 Certification Available

Examination can be of four types: initial examinations (new candidates), supplementary examinations (certificate holders wishing to improve their existing certificates) retests (repeat of failed parts of examinations) and ten year renewal examinations.

Details of the examination format and syllabus can be found in the relevant part of Appendix 1.

5.1 CSWIP Ultrasonic Inspector Level 1 (Appendix 1 Part 1a)

Candidates may apply for examination in one or more of the following categories:

Butt welds in plate and pipe
Thickness measurement and monitoring
Wrought products (including forgings)
Castings.

5.2 Automated Ultrasonic Inspector and Phased Array Ultrasonic Inspector Level 1 (Appendix 1, Part 1b)

Candidates may apply for examination in one or more of the following categories:

Automated ultrasonic girth weld operator
Phased array ultrasonic inspector.

5.3 TOFD Ultrasonic Testing Level 1 (Appendix 1 Part 1c)

Candidates may apply for examination in one or more of the following categories:

Inline Non-Ferritic welds
Inline Ferritic welds.

5.4 CSWIP Ultrasonic Inspector Level 2 (Appendix 1 Part 1a)

Candidates may apply for examination in one or more of the following categories:

5.4.1 Thickness measurement & monitoring (Appendix 1 Part 1a)

Categories of certification available are thickness measurement or corrosion monitoring.

5.4.2 Wrought products (including forgings) (Appendix 1 Part 1a)

Categories of certification available include bar and billet, plate and forgings or combinations of these products.

5.4.3 Castings (Appendix 1 Part 1a)

One category of certification is available for the ultrasonic inspection of castings

5.4.4 Welds (Appendix 1 Part 1a)

Practical welds samples are available in 11 different categories of weld joint geometry subdivided into five groups as described in Appendix 1 Part 1a.

5.4.5 Ultrasonic Corrosion & Erosion Monitoring (UCM) Endorsement (Appendix 1 Part 1a)

An endorsement examination is available.

5.4.6 Electromagnetic Acoustic Transducer (EMAT) Inspection Corrosion & Erosion Endorsement (Appendix 1 Part 1a)

An endorsement examination is available.

5.4.7 Automated Ultrasonic Inspector (Appendix 1 Part 1b)

Two categories of certification are available:

Level 2 Automated Data Interpreter
Level 2 Senior Automated Inspector

Note: These categories apply only to conventional pipeline girth welds. They do not cover special situations, for example if the inspection involves Inconel cladding.

5.4.8 Phased Array Ultrasonic Inspector (Appendix 1 Part 1b)

Four categories of certification are available:

- Welds
- Wrought products (including forgings)
- Castings
- Data analysis

Endorsement examinations are available for:

- Critical sizing
- Corrosion and erosion monitoring

5.4.9 TOFD Ultrasonic Testing (Appendix 1 Part 1c)

Two categories of certification are available:

- Welds
- Data analysis

5.5 CSWIP Ultrasonic Inspector Level 3 (Appendix 1 Part 1a and 1b and 1c)

Six categories of certification are available:

- Welds
- Wrought Products (including forgings)
- Castings
- Automated Ultrasonic Inspection
- Phased Array Ultrasonic Inspector
- TOFD

5.6 CSWIP Magnetic Particle Inspector Level 1 (Appendix 1 Part 2)

Two categories of certification are available:

- General Engineering (welds, castings and wrought products (including forgings))
- Welds

5.7 CSWIP Magnetic Particle Inspector Level 2 (Appendix 1 Part 2)

Two categories of certification are available:

- General Engineering (welds, castings and wrought products (including forgings))
- Welds

5.8 CSWIP Magnetic Particle Inspector Level 3 (Appendix 1 Part 2)

One category of certification is available:

- General Engineering (welds, castings and wrought products including forgings)

5.9 CSWIP Liquid Penetrant Inspector Level 1 (Appendix 1 Part 3)

Two categories of certification are available:

- General Engineering (welds, castings and wrought products including forgings)
- Welds

5.10 CSWIP Liquid Penetrant Inspector Level 2 (Appendix 1 Part 3)

Two categories of certification are available:

- General Engineering (welds, castings and wrought products including forgings)
- Welds

5.11 CSWIP Liquid Penetrant Inspector Level 3 (Appendix 1 Part 3)

One category of certification is available:

- General Engineering (welds, castings and wrought products including forgings)

5.12 CSWIP Radiographic Interpreter Level 2 (Appendix 1 Part 4a or 4b)

Two categories of certification are available:

- Castings
- Welds

5.13 CSWIP Radiographic Inspector Level 1 (Appendix 1 Part 5a or 5c)

Two categories of certification available are:

- Castings
- Welds

5.14 CSWIP Computed Radiographic Inspector Level 1 (Appendix 1 Part 5b)

Three categories of certification available are:

- Welds
- Castings
- Profile and Tangential

5.15 CSWIP Radiographic Inspector Level 2 (Appendix 1 Part 5a or 5c)

Two categories of certification are available:

- Castings
- Welds

5.16 CSWIP Computed Radiographic Inspector Level 2 (Appendix 1 Part 5b)

Three categories of certification available are:

- Welds
- Castings
- Profile and Tangential

5.17 CSWIP Computed Radiographic Interpreter Level 2 (Appendix 1 Part 5b)

Two categories of certification available are:

- Welds & Castings
- Profile Radiography

5.18 CSWIP Radiographic Inspector Level 3 (Appendix 1 Part 5a or 5c)

Two categories of certification are available:

- Castings
- Welds

5.19 CSWIP Visual and Optical Inspector Level 1 (Appendix 1 Part 6)

Two categories of certification are available:

- General Engineering (welds, castings and wrought products including forgings)
- Welds

5.20 CSWIP Visual and Optical Inspector Level 2 (Appendix 1 Part 6)

Two categories of certification are available:

- General Engineering (welds, castings and wrought products (including forgings)
- Welds

5.21 CSWIP Visual and Optical Inspector Level 3 (Appendix 1 Part 6)

One category of certification is available:

- General Engineering (welds, castings and wrought products (including forgings)

5.22 CSWIP ACFM Inspector Level 1 (Appendix 1 Part 7)

Two categories of certification are available:

- General engineering (welds, plate, castings, forgings and bars made of ferritic steels or electromagnetically similar materials)
- Rail

5.23 CSWIP ACFM Inspector Level 2 (Appendix 1 Part 7)

Two categories of certification are available:

- General engineering (welds, plate, castings, forgings and bars made of ferritic steels or electromagnetically similar materials)
- Rail

5.24 CSWIP ACFM Inspector Level 3 (Appendix 1 Part 7)

One category of certification is available:

- General engineering (welds, plate, castings, forgings bars and rail, made of any of the materials mentioned in 5.17 and 5.18 above)

5.25 CSWIP Eddy Current Inspector Level 1 (Appendix 1 Part 8)

Two categories of certification are available:

- Welds
- Wrought products

5.26 CSWIP Eddy Current Inspector Level 2 (Appendix 1 Part 8)

Three categories of certification are available:

- Welds
- Wrought products
- Tubes

5.27 CSWIP Eddy Current Array (Appendix 1 Part 8)

Three categories of certification are available:

- Welds
- Wrought products
- Tubes

5.28 CSWIP Eddy Current Inspector Level 3 (Appendix 1 Part 8)

Categories of certification available:

- Welds
- Wrought and tubular products

5.29 CSWIP Radiation Safety Level 1 – Basic (Appendix 1 Part 9)

One category of certification is available.

5.30 CSWIP Radiation Safety Level 2 – Supervisor (Appendix 1 Part 9)

One category of certification is available.

5.31 CSWIP Leak Detection Inspector Level 1 (Appendix 1 Part 10)

Categories of certification available:

- Pressure Testing
- Tracer Gas Testing.

5.32 CSWIP Leak Detection Inspector Level 2 (Appendix 1 Part 10)

Categories of certification available:

- Pressure Testing
- Tracer Gas Testing.

5.33 CSWIP Leak Detection Inspector Level 3 (Appendix 1 Part 10)

One category of certification is available:

- Pressure and Tracer Gas Testing

5.34 CSWIP Guided Wave Testing (GWT) Inspector Level 1 (Appendix 1 Part 11)

One category of certification is available:

- Pipes and pipelines.

5.35 CSWIP Guided Wave Testing (GWT) Inspector Level 2 (Appendix 1 Part 11)

One category of certification is available:

- Pipes and pipelines

5.36 CSWIP Guided Wave Testing (GWT) Inspector Level 3 (Appendix 1 Part 11)

One category of certification is available:

- Pipes and pipelines.

6 Examination Content

The qualification examinations include a general and a specific examination for each level of competence. Each examination consists of a written part and a practical part.

The general and specific theory examinations are mainly comprised of multiple-choice answer questions. The time allowed for examinations comprised of multiple-choice questions is 1.5 minutes per question. The time allowed for narrative answer questions varies but is specified on the examination paper presented to the candidate.

The general and specific practical part is of sufficient duration, complexity and scope to verify adequately the candidate's ability to apply the NDT method to real test situations.

6.1 Exemptions

Candidates sitting initial CSWIP examinations are not required to attempt an examination part in which they have already achieved success during the process of gaining a CSWIP or equivalent BS EN ISO 9712 certification.

CSWIP will grant exemptions for the Level 3 Basic examination part A1 (materials processes and discontinuities) and part B (Level 2 knowledge of four NDT methods), and the Level 3 Main Method examination part C1 (Level 3 knowledge relating to the test method) for holders of centrally issued valid ASNT Level III certification.

6.2 Level 1 and 2 Examinations

6.2.1 General theory examination

In the general theory examination the candidate shall demonstrate proficiency in performing the relevant NDT method. The candidate is required to give answers to the fixed number multiple-choice questions shown below.

NDT Method	Number of Questions	
	Level 1	Level 2
Liquid penetrant testing (PT)	30	30
Magnetic particle testing (MT)	30	30
Radiographic testing (RT)	40	40
Radiographic interpretation (RI)	N/A	40
Ultrasonic testing (conventional) (UT)	40	40
Automated Ultrasonic Testing (AUT)	40	40*
Automated Ultrasonic Data Interpreter (AUTDI)	40	40*
Phased Array Ultrasonic Testing (PAUT)	N/A	40*
Critical Sizing Endorsement (CSE)	N/A	N/A
Guided Wave Testing (GWT)	40	40
TOFD Ultrasonic Testing (TOFD)	40	40*
Visual and optical testing (VT)	30	30
ACFM (ET)	40	40
Eddy current testing (EC)	40	40
Ultrasonic thickness measurement (UTCM) and Corrosion Monitoring	40	40
Radiation Safety (RS)	30	40
Pressure Testing (PRT)	30	30
Tracer Gas Testing (TGT)	30	30

* Candidates who hold a valid Ultrasonic Level 2 ISO 9712 certification will be exempt from the General Level 2 paper.

6.2.2 General practical examination

The practical test in the general examination is to verify the candidate's ability to make required settings operate and calibrate the test equipment properly in order to obtain satisfactory results and correctly interpret these results. The candidate is required therefore to demonstrate this ability, with comments, using the means available, as directed by the examiner, for each test method.

6.2.3 Specific theory examination

In the specific theory examination the candidate shall demonstrate sufficient knowledge and understanding of the application of the relevant test method in the applicable industrial sector or product type. During the specific theory examination the candidate is required to give answers to a fixed number of questions, the minimum number being defined in the table

below, including multiple-choice answer questions, calculations, written procedures and questions on codes, standards and specifications.

NDT Method	Number of Questions	
	Level 1	Level 2
Liquid penetrant testing (PT)	20	20
Magnetic particle testing (MT)	20	20
Radiographic testing (RT)	20	20
Digitised Radiographic Testing (DRT)	20	20
Radiographic interpretation (RI)	N/A	20
Digitised Radiographic interpretation(DRI)	N/A	20
Ultrasonic testing (conventional) (UT)	20	20
Ultrasonic Corrosion & Erosion Monitoring Endorsement (UCM)	N/A	20
Ultrasonic thickness measurement (UTM)	20	20
Electromagnetic Acoustic Transducer (EMAT) Inspection Corrosion & Erosion Endorsement	N/A	20
Automated Ultrasonic Testing (AUT)	20	20
Automated Ultrasonic Data Interpreter (AUTDI)	N/A	20
Phased Array Ultrasonic Testing (PAUT)	N/A	20
Phased Array Corrosion Monitoring Endorsement (PACM)	N/A	20
Critical Sizing Endorsement (CSE)	N/A	N/A
Phased Array Data Analysis	N/A	20
Guided Wave Testing (GWT)	30	30
TOFD Ultrasonic Testing (TOFD)	20	20
TOFD Data Analysis	N/A	20
Visual and optical testing (VT)	20	20
Electromagnetic testing (ET)	20	20
Eddy current testing (EC)	20	20
Eddy current array (ECA)	N/A	20
Radiation Safety	N/A	N/A
Pressure Testing (PRT)	20	20
Tracer Gas Testing (TGT)	20	20

Note: If the specific examination covers two or more sectors the minimum number of questions shall be 30, evenly spread between the sectors concerned.

6.2.4 Specific practical examinations

The practical test in the specific examination is to verify the candidate's ability to perform testing of prescribed components relating to the industrial sector concerned, to record and analyse the resultant information to the degree required, according to specific testing instructions or specifications and to the NDT level being sought.

Level 2 candidates are required to demonstrate the ability to prepare written instructions for Level 1 personnel.

6.3 Level 3

The qualification examination for Level 3 consists only of a written examination covering a specified test method.

The examination covers:

- Basic knowledge relating to the test method applied for and to materials, processes and discontinuities; questions of a Level 2 standard relating to other NDT methods (MT, PT, RT, UT, ET (Eddy current inspection), VT, AE (Acoustic Emission), TIR (Thermal Infra-Red inspection); requirements for the certification of NDT personnel as outlined in ISO 9712(2) EN 473 (5) and SNT-TC-1A (6).
- Specific knowledge relating to the application of the NDT method in which the candidate is being examined including applicable codes, standards and specifications, plus knowledge of the product being tested.
- If the candidate is not qualified to Level 2 at the time of application, then they shall also successfully complete the practical examination in the relevant NDT method.

6.3.1 Basic examination

The basic examination includes only multiple choice questions and consists of three sections. The number of questions and the areas covered are as shown below.

Candidates successful in Section A and B of the basic examination will not be required to re-sit this section when attempting additional Level 3 examinations in other methods.

- A1 25 questions on materials, processes and discontinuities
- A2 10 questions on the certification body's certification and qualification system
- B Up to 60 questions of a Level 2 standard relating to the general knowledge of up to four NDT methods chosen from those listed in 3.1.1. One of those methods chosen shall be a volumetric test method (UT or RT).

6.3.2 Main method examination

- C1 30 questions of Level 3 knowledge relating to the test method concerned.
- C2 20 questions relating to the application of the method in the sector concerned. This maybe an open book examination where questions relating to codes, standards and specifications are involved.
- C3 The drafting of an NDT procedure for a component selected by the examiner. The use of applicable codes, standards and specifications by the candidate shall be allowed.

6.4 Grading

To be certified the candidate shall obtain a grade of at least 70% in each section of the examination.

7 Certification

7.1 Results notices

All candidates will be sent a results notice. This notice will also be sent to the organisation paying the examination fee, if not paid by the candidate.

Results notices will indicate whether the candidate has achieved success or otherwise in the examination, the marks gained in each part of the examination, whether retests are allowable and brief reasons for failure of any part of the examination. The personal details recorded shall be those provided by the candidate.

7.2 Successful candidates

Two copies of a certificate of proficiency will be issued to the sponsoring organisation or person. Duplicate certificates to replace those lost or destroyed will be issued only after extensive enquiries.

7.3 Unsuccessful candidates

Candidates who fail to pass the initial examination may attempt one retest on those parts of the examination in which success was not achieved. The retest must be completed within one year of the initial test; otherwise candidates will have to repeat the complete examination.

The retest, (or complete re-examination) may not be taken within 30 days of the previous examination, unless further specific training is undertaken.

7.4 Period of validity

The certificate is valid for five years from the date of completion of the initial examination and may be renewed for a further five years on application, provided evidence is produced in accordance with Clause 7.5.1. Certificates are only valid provided they:

- a) Are within date.
- b) Are on standard cream CSWIP paper bearing the CSWIP logo in black on gold signed by an officer of CSWIP and embossed with the CSWIP stamp.
- c) Have been signed by the individual to whom the certificate is awarded.
- d) Are accompanied by a valid official CSWIP identity card.
- e) Accompanied by a valid visual acuity test, in accordance with Clause 3.4 issued within the previous twelve months.

Photocopies are unauthorised by CSWIP and should only be used for internal administrative purposes.

7.5 Five year renewal procedure

Individuals whose certificates expire at the end of the five year period may renew their certificates for a further five years if they are able to supply evidence of reasonably continuous work activity in the relevant method during the period of validity of the certificate. For radiographic inspectors Level 1, 2 and 3 candidates must hold a current recognised radiation safety qualification.

The radiation safety qualifications Levels 1 and 2 may only be renewed by examination every five years.

Renewal must take place not later than 21 days after the date of expiry. It is the certificate holders' responsibility to ensure that renewal takes place at the appropriate time. Only under extreme circumstances will certificates be renewed up to a maximum of six calendar months from the date of expiry shown on the certificate and late renewal will be subject to a special fee.

7.5.1 General requirements

In all cases, the individual applying for renewal must provide evidence of:

- a) A current satisfactory vision examination (see Clause 3.4)
- b) Continued satisfactory work activity without significant interruption.

A significant interruption means an absence or a change of activity which prevents the certified individual from practising the duties corresponding to their level in the method and the industrial sector(s) for which they are certified, for one or several periods for a total time exceeding one year.

7.5.2 Ten year recertification procedure – Levels 1 and 2

At the end of a further five years, (i.e. 10 years from Initial certification) a recertification examination will be required consisting of a practical part of the initial examination prior to the expiry date of the certificate in addition to the renewal procedure given in Clause 7.5.1 above. Further information can be obtained from the relevant part of Appendix 1.

It is recommended that recertification examinations (see below) are carried out between six and one month prior to the expiry of the certificate as failure to do so may affect the continuity of their certification. Candidates failing to take the renewal examination before the expiry date of their certificate may be treated as initial candidates.

It is not possible to combine ten year renewal examinations with supplementary examinations for additional groups not included in the original certificate.

Any previous certificate is invalidated upon issue of the result of the ten year renewal examination.

A candidate unsuccessful in any section of the examination will be allowed one further attempt in the section or sections failed. One retest, within six months of the 10 year recertification examination, will be allowed.

If the candidate is unsuccessful in this second examination no certificate will be awarded and, to obtain a certificate, the procedure for a new candidate will have to be followed.

The pass mark for all recertification examinations is 70%.

7.5.3 Level 3

Inspectors whose certificates expire at the end of the ten year period will be recertified provided they meet the following:

1. Provide evidence of a current satisfactory vision examination (see Clause 3.4).
2. Provide evidence of continued satisfactory work activity without significant interruption (see Clause 7.5.1).
3. Successfully complete a closed book multiple choice examination of 20 questions on the method application in the industrial or product sector or sectors concerned, and successfully answer four open book narrative questions to demonstrate the candidate's understanding of current technology and codes utilised within the method.
4. Successfully complete the relevant method Level 2 re-certification practical examination. Candidates who hold valid Level 2 certification, of the same scope, shall be exempt from this part of the Level 3 recertification process.

5. As an alternative to Parts 3 and 4 above the candidate may gain recertification by meeting the requirements of a structured credit system as detailed below.

Candidates shall submit separate applications for each Level 3 certificate for which recertification is sought.

Where the candidate elects to take the route comprising items 1, 2, 3 and 4 above applications shall be made to the Test Centre of their choice.

Where the candidate elects to take the route comprising items 1, 2 and 5 above application shall be made to TWI Certification Ltd.

Candidates who fail to reach a grade of at least 70% in the recertification examination comprising items 1, 2, 3 and 4 shall be allowed one further attempt of the failed parts within six months of the recertification date.

Candidates who fail the retest must undertake the relevant main method examination and Level 2 practical examination in full.

Candidates who do not meet the requirement of recertification under items 1, 2 and 5 shall be permitted one attempt at the method comprising items 1, 2, 3 and 4 above within six months. Failure in this will require the candidate to undertake the relevant main method examination and Level 2 practical examination in full.

7.5.3.1 Structured credit scheme for Level 3 re-certification

In this system, the Level 3 candidate gains credit for participation, during the five years prior to recertification, in the various NDT activities shown in the Table below. Limits are placed on the maximum number of points which can be gained in each year, and in any activity over the five years, to ensure an even spread of activities.

To be eligible for recertification a minimum of 70 points must be accrued over the five year validity of the certificate, whilst a maximum of 25 points per year will be accepted.

In addition to the recertification application, the candidate shall submit evidence of satisfying the criteria of the Table as follows:

- Agenda and list of attendees for the meetings under items 1 to 4.
- A brief description of research & development under item 5.
- References to technical or scientific publications under item 5.
- A summary of training delivered under item 6.
- For each certificate, evidence of work activity per year under item 7.

Structured credit system for Level 3 recertification

Item	Activity	Points accorded for each item (or function)	Maximum points per year per item	Maximum points per 5 year period per item
1	Membership of a relevant professional institution, attendance at seminar, symposia, conferences and/or courses covering NDT and related sciences and technologies	1	3	8 ^a
2.1	Attendance at international and national standardisation committees	1	3	8 ^a
2.2	Convenorship of standardisation committees	1	3	8 ^{a,b}
3.1	Attendance at sessions of other NDT committees	1	3	8 ^a
3.2	Convenorship of sessions of other NDT committees	1	3	8 ^{a,b}
4.1	Attendance at sessions of NDT related working groups	1	5	15 ^a
4.2	Convenorship of NDT related working groups	1	5	15 ^{a,b}
5.1	NDT related technical/scientific contribution of publications	3	6	20 ^{c,d}
5.2	NDT related research work published	3	6	15 ^{c,d}
5.3	NDT research activity	3	6	15 ^{c,d}
6	NDT technical instructor (per 2 hours) and/or NDT examiner (per examination)	1	10	30 ^d
7	Industrial Activity			
7.1	NDT method in an examination centre or for engineering of NDT (for each full year)	10	10	40 ^d
7.2	Dealing with disputes referring to clients	1	5	15 ^d
7.3	Development of NDT applications	1	5	15 ^d
<p>a Maximum points for items 1 to 4: 20 b Points to be given for both convenorship and attendance c If there is more than one author, the lead author shall define points for the other authors d Maximum points for each of items 5 and 6: 30 and 7: 50.</p>				

7.6 Complaints and appeals

An aggrieved party in a dispute which considers itself to have reasonable grounds for questioning the competency of a CSWIP qualified person may petition the Governing Board for invalidation of the certificate. Such a petition must be accompanied by all relevant facts, and if in the opinion of the Board an adequate case has been presented, a full investigation of the circumstances under dispute will be initiated.

Appeals against failure to certify or against invalidation of the certificate may be made by the holder upon application in writing to the Governing Board.

7.7 Supplementary examinations

Certificated candidates who apply to be examined in additional groups of weld samples or sectors will be required to pass an additional specific theory examination in addition to the practical examination covering the extra group(s) of weld categories or sector. The pass mark for each part is 70%. Candidates who fail to pass a part of the supplementary examination may attempt one retest, the retest must be completed within six months of the supplementary examination.

Supplementary examinations may not be attempted 30 days prior to the expiry of an existing certificate.

Success in a supplementary examination does not extend the life of the certificate to which it is added.

8 Records

The CSWIP Chief Executive maintains records of successful and unsuccessful candidates. These records are accessible to the Governing Board or its nominees at all reasonable times.

9 References

- | | | |
|----|---|--|
| 1 | ISO 17024:2012 | 'General criteria for certification bodies operating certification of personnel.' |
| 2 | ISO 9712: 2012 | 'Non-destructive testing – Qualification and certification of personnel.' |
| 3 | http://www.hse.gov.uk/dst/ndt1.pdf | 'Best practice for the procurement and conduct of non-destructive testing, Part 1: Manual Ultrasonic Inspection |
| 4 | http://www.hse.gov.uk/dst/ndt2.pdf | Best practice for the procurement and conduct of non-destructive testing, Part 2; Magnetic Particle and Dye Penetrant Inspection |
| 5 | Recommended Practice | Guideline to Personnel Qualification and SNT-TC-1A, 1996 Certification in NDT |
| 6. | CSWIP-ES-NDT-12-04 | Requirements for the Employer Specific Certification of Personnel Engaged in Non-Destructive Testing in accordance with the requirements of ISO 9712 |

10 Addresses

For further general information contact:

TWI Certification Ltd
Granta Park
Great Abington
Cambridge CB21 6AL

Phone: +44 (0) 1223 899000
Fax: +44 (0) 1223 894219
Email: twicertification@twi.co.uk

For specific information on examinations and tests and arranging for them to be carried out, contact the approved Examining Body:

TWI Training and Examinations
Granta Park
Great Abington
Cambridge CB21 6AL

Phone: +44 (0) 1223 899000
Fax: +44 (0) 1223 891630
Email: trainexam@twi.co.uk