

INTERNATIONAL  
STANDARD

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**Non-destructive testing — Qualification  
and certification of personnel**

*Essais non destructifs — Qualification et certification du personnel*

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Reference number  
ISO 9712:1999(E)

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 9712 was prepared by Technical Committee ISO/TC 135, *Non-destructive testing* Subcommittee SC 7, *Personnel qualification*.

This second edition cancels and replaces the first edition (ISO 9712:1992) which has been technically revised.

Annexes A to C of this International Standard are for information only.

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## Introduction

Since the effectiveness of any application of non-destructive testing depends upon the capabilities of the persons who perform or who are responsible for the test, a procedure was developed to provide a means for evaluating and documenting the competence of personnel whose duties require the appropriate theoretical and practical knowledge of the non-destructive tests that they perform, specify, supervise, monitor or evaluate. An added incentive stems from the world-wide comparability of a wide range of industrial applications requiring common non-destructive testing approaches.

Any certification body adopting this International Standard shall comply with level 3 requirements for qualification and certification, but is permitted a transition period of up to five years to implement levels 1 and 2.

The aim is to permit the starting of the system in a country that has no third party certification. It is also applicable when an independent certification body applies the certification scheme to a new NDT method or when a new industrial sector is created.

NOTE Wherever gender specific words such as "his", "her", "he" or "she" appear in this International Standard the other gender is also applicable.

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# Non-destructive testing — Qualification and certification of personnel

## 1 Scope

1.1 This International Standard establishes a system for the qualification and certification, by a certification body, of personnel to perform industrial non-destructive testing (NDT) using any of the following methods:

- a) eddy current testing;
- b) liquid penetrant testing;
- c) magnetic particle testing;
- d) radiographic testing;
- e) ultrasonic testing.

1.2 The system described in this International Standard may also apply to visual inspection (VT), leak testing (LT), neutron radiography (NT), acoustic emission (AT) and other NDT methods where independent certification programmes exist.

1.3 Where latitude is provided in the criteria within this International Standard, the certification body shall have the final decision in determining specific requirements.

## 2 Normative reference

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

EN 45013:1989, *General criteria for certification bodies operating certification of personnel*.

### 3 Terms and definitions

For the purposes of this International Standard, the following terms and definitions apply.

#### 3.1

##### **authorized qualifying body**

competent organization, independent of the employer or responsible agency, approved by the certification body to prepare and administer examinations to qualify NDT personnel

#### 3.2

##### **candidate**

individual seeking certification in accordance with this International Standard

#### 3.3

##### **certificate**

written testimony of qualification

#### 3.4

##### **certification body**

agency that administers procedures for certification of NDT personnel in accordance with the requirements of this International Standard

#### 3.5

##### **certification**

procedures leading to a written testimony of the qualification of an individual's level of competence in a given NDT method and industrial sector

#### 3.6

##### **employer or responsible agency**

organization for which the candidate works on a regular basis

#### 3.7

##### **examination, basic**

one of the level 3 qualification examinations which assesses the knowledge of:

- the materials science and processes technology,
- this qualification and certification system and
- the basic principles of NDT methods as required for level 2

#### 3.8

##### **examination centre**

centre approved by the certification body, either directly or through the authorized qualifying body, where qualification examinations will be carried out

#### 3.9

##### **examination, general**

written level 1 or level 2 examination concerned with the principles of an NDT method

#### 3.10

##### **examination, job-specific**

any additional examination concerned with the application of an NDT method to a specialized product not commonly involved in a particular industrial sector

NOTE This examination is outside the scope of this International Standard.

**3.11****examination, main method**

one of the level 3 qualification examinations, which assesses the general and specific knowledge of the level 3 candidate in the method for which certification is sought, and the ability to write NDT procedures

**3.12****examination, practical**

examination to assess the candidate's ability to perform the NDT method

**3.13****examination, qualification**

examination administered by a certification body or by an authorized qualifying body, which assesses the knowledge and capabilities of the candidate

**3.14****examination, specific**

written examination concerned with the application of an NDT method in a particular industrial sector or sectors, which includes knowledge of the product and related codes, standards, specifications and acceptance criteria

**3.15****examiner**

person certified to level 3 in the method he is to examine, and authorized by the certification body to conduct and/or grade NDT qualification examinations

## NOTE

No level 3 person shall be the only examiner for any candidate he has personally trained for that examination.

**3.16****experience**

period during which the candidate performed the specific NDT method under qualified supervision, including personal application of the NDT method to materials, parts or structures

**3.17****industrial sector**

particular area in industry or technology where specialized NDT practices are utilized requiring specific skill, knowledge, equipment or training to achieve satisfactory performance

## NOTE

An industrial sector may be interpreted to mean a product (welds, castings, etc.) or an industry (aerospace, steel, etc.), see also annex A

**3.18****NDT instruction**

written description of the precise steps to be followed in testing to an established NDT procedure, standard, code or specification

**3.19****NDT method**

application of a physical principle in non-destructive testing (e.g. ultrasonic testing)

**3.20****NDT procedure**

orderly sequence of steps describing where, how and in which sequence an NDT method should be applied to a product

**3.21****NDT technique**

specific way of utilizing an NDT method (e.g. immersion ultrasonic testing)

**3.22****NDT training**

process of instruction in theory and practice in the NDT method in which certification is sought, which takes the form of training courses to an approved syllabus, but shall not include the use of specimens used in practical examinations

**3.23****operating authorization**

permission to work, issued by the employer or responsible agency and based on the individual's suitability for a specific job

**3.24****qualification**

demonstration of physical attributes, knowledge, skill, training and experience required to properly perform NDT tasks

**3.25****significant interruption**

absence or a change of activity which prevents the certified individual from practising the duties corresponding to his level in the method and the industrial sector(s) for which he is certified, for a continuous period exceeding one year

**3.26****supervision**

act of directing the application of NDT performed by other NDT personnel, which includes the control of actions involved in the preparation of the test, performance of the test and reporting of the results

**3.27****test specimen**

sample used in practical examinations

NOTE Samples should be representative of products typically tested in the applicable industrial sector and may include more than one area or volume to be tested.

**3.28****trainee**

individual who works under the supervision of certified personnel but who does not conduct any tests independently, does not interpret test results and does not write reports on test results

NOTE This individual may be registered as being in the process of gaining appropriate experience to establish eligibility for qualification to level 1 or for direct access to level 2

**4 Abbreviations**

The following abbreviations shall be used to identify the five Non-destructive testing (NDT) methods covered by this International Standard:

— eddy current testing	ET
— liquid penetrant testing	PT
— magnetic particle testing	MT
— radiographic testing	RT
— ultrasonic testing	UT

## 5 Levels of competence (NDT levels)

### 5.1 Classification

An individual certified in accordance with this International Standard shall be classified in one of the following three levels, whereas one who has not yet attained certification may be classified as a trainee.

### 5.2 NDT level 1

**5.2.1** An individual certified to NDT level 1 is qualified to carry out NDT operations in accordance with written instructions and under the supervision of level 2 or level 3 personnel.

He shall be able to:

- a) set up the equipment;
- b) perform the tests;
- c) record and classify the results in accordance with documented criteria;
- d) report on the results.

**5.2.2** An individual certified to level 1 shall not be responsible for the choice of the test method or technique to be used.

### 5.3 NDT level 2

An individual certified to NDT level 2 is qualified to perform and direct non-destructive testing in accordance with established or recognized procedures. This may include:

- a) defining the limitations of application of the test method for which the level 2 individual is qualified;
- b) translating NDT codes, standards, specifications and procedures into practical testing instructions adapted to the actual working conditions;
- c) setting up and verifying equipment settings;
- d) performing and supervising tests;
- e) interpreting and evaluating results according to applicable codes, standards and specifications;
- f) preparing NDT instructions;
- g) carrying out or supervising all level 1 duties;
- h) training or guiding personnel below level 2;
- i) organizing and reporting results of non-destructive tests.

### 5.4 NDT level 3

**5.4.1** An individual certified to NDT level 3 may be authorized to direct any operation in the NDT method(s) for which he is certified. This may include:

- a) assuming full responsibility for an NDT facility and staff;
- b) establishing and validating techniques and procedures;
- c) interpreting codes, standards, specifications and procedures;

- d) designating the particular test methods, techniques and procedures to be used for specific NDT work;
- e) interpreting and evaluating results in terms of existing codes, standards and specifications;
- f) managing qualification examinations, if authorized for this task by the certification body;
- g) carrying out or supervising all level 1 and level 2 duties.

**5.4.2** An individual certified to level 3 shall have:

- a) sufficient practical background in applicable materials, fabrication and product technology in order to be able to select methods and establish techniques and to assist in establishing acceptance criteria where none is otherwise available;
- b) a general familiarity with other NDT methods;
- c) the ability to train or guide personnel below level 3.

## 6 Responsibilities

### 6.1 General

The certification activity shall be administered by a certification body, with the assistance, where necessary, of authorized qualifying bodies. It includes all procedures adopted to demonstrate the qualification of an individual to carry out tasks in a specific NDT method and leads to certification of his competence.

### 6.2 Certification body

**6.2.1** A certification body shall conform with the requirements of EN 45013. It should be a non-profit organization which has no direct involvement in training of NDT personnel and it should be recognized by the NDT community or the ISO member body of the country concerned.

**6.2.2** A certification body shall be supported by a committee composed of representatives of NDT societies, committees, users, suppliers, government departments and other interested parties as appropriate. This committee shall be responsible for setting and maintaining the technical standards of examination. Its members shall be qualified for the tasks by an appropriate combination of NDT certification and/or experience. At least 50 % of its members shall hold a valid level 3 certification.

**6.2.3** A certification body:

- a) shall initiate, maintain and promote the certification scheme as specified in this International Standard;
- b) shall administer the procedures and operations for certification in accordance with a documented procedure, meeting the minimum requirements of this International Standard and a stringent code of ethics, including sanctions, which shall apply to committee members and certificate holders;
- c) may delegate, under its direct responsibility, the detailed administration of the certification procedure to other organizations acting as qualifying bodies;
- d) shall take the ultimate responsibility for the certification scheme, including technical and administrative requirements;
- e) shall approve, either directly or through an authorized qualifying body, properly staffed and equipped examination centres which it shall monitor on a periodic basis;
- f) shall keep all appropriate records and issue, or delegate the issuing of, certificates;

- g) shall maintain a collection of current examination questions. For each multiple-choice question this data bank shall indicate the correct answer. For other questions this data bank shall include a model answer. It is desirable that answers include a reference that validates the answer;
- h) shall, when creating a multi-sector, define precisely the chosen combination of the sectors which constitute the multi-sector. Guidance on the creation of industrial sectors is given in annex A.

### 6.3 Authorized qualifying bodies

An authorized qualifying body shall, where established, be approved by the certification body and shall, with the approval of the certification body:

- a) apply a documented quality procedure;
- b) establish and monitor examination centres;
- c) prepare and supervise the qualification examinations;
- d) maintain appropriate qualification and examination records according to the requirements of the certification body.

### 6.4 Examination centres

6.4.1 Examination centres shall be established or approved by the certification body or through authorized qualifying bodies and shall, as a minimum:

- a) have adequate qualified staff, premises and equipment to ensure satisfactory qualification examinations for the levels, methods and industrial sectors concerned;
- b) use only those documents and examination questionnaires established or approved by the certification body;
- c) use only specimens approved by the certification body for the practical examinations conducted at that centre;
- d) apply a documented quality procedure.

6.4.2 When more than one authorized examination centre exists, each shall have test specimens of comparable test difficulty containing similar discontinuities. Under no circumstances shall test specimens be used for training purposes.

### 6.5 Employer or responsible agency

6.5.1 The employer or responsible agency shall introduce the candidate to the certification body or the authorized qualifying body and document the validity of the personal information provided. The documentation shall include the declaration of education, training and experience needed to establish the eligibility of the candidate. The employer or responsible agency shall not be directly involved in the certification procedure itself.

6.5.2 The employer or responsible agency shall be fully responsible for all that concerns the authorization to operate, including the validity of the results of NDT operations.

6.5.3 The employer or the responsible agency shall ensure that employees annually meet the visual acuity requirements of 7.2.3 (see note in 9.2).

6.5.4 If the individual is self-employed, or presents himself alone, he shall assume all responsibilities specified for the employer or responsible agency.

## 7 Eligibility

### 7.1 Eligibility for examination

To be eligible for examination, the candidate shall fulfil the minimum NDT training requirements which are specified in this clause.

#### 7.1.1 NDT training - level 1 and level 2

The candidate shall provide evidence acceptable to the certification body of completion of a course of NDT training in the method and level for which certification is sought. Training providers should issue documentary proof of completion of training.

Information in annex B may be used to guide development of training and education syllabi.

Table 1 provides guidance on the duration of training. However, when deciding the duration of training required, the certification body may consider other factors, such as education, certification in other methods and sectors and the nature of the training.

**Table 1 — Duration of training**

NDT Method	Level 1 (hours)	Level 2 (hours)
ET	40	40
PT	16	24
MT	16	24
RT	40	80
UT	40	80

NOTE 1 Training hours include both practical and theory courses.

NOTE 2 Direct access to level 2 implies the total hours for level 1 and level 2.

#### 7.1.2 Training — level 3

Depending on the scientific and technical potential of a candidate for level 3 certification, preparation for qualification may be done in different ways: e.g. by attending training courses, conferences or seminars (such as those organized by industrial or independent associations), studying books, periodicals and other sources of relevant information. However the candidate has prepared, he shall provide documentary evidence of training acceptable to the certification body.

Information in annex B may be used to guide development of training and education syllabi.

### 7.2 Eligibility for certification

To be eligible for certification, the candidate shall have passed the qualification examination and shall fulfil the minimum requirements specified in this clause.

#### 7.2.1 NDT experience — level 1 and level 2

The minimum requirements for experience to be gained prior to certification shall be as specified in Table 2. Documentary evidence of experience shall be verified by the employer and provided to the certification body.

**Table 2 — Minimum experience requirements — levels 1 and 2**

NDT Method	Experience (months)	
	Level 1	Level 2
ET	3	9
PT	1	3
MT	1	3
RT	3	9
UT	3	9

NOTE 1 Work experience in months is based on a nominal 40 h/week (175 h/month) or the legal week of work. Any individual working in excess of 40 h per week, may be credited with experience based on the total hours, but shall be required to produce documentary evidence of this experience.

NOTE 2 For level 2 certification, the intent of this International Standard is that work experience consists of NDT work time as an individual certified to level 1. 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 times required for level 1 and level 2.

NOTE 3 Credit for work experience may be gained simultaneously in two or more of the NDT methods covered by this International Standard, with the reduction of total required experience as follows:

- 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 %.

In all cases where a reduction is sought 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 in this table.

### 7.2.2 NDT experience — 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, which shall be documented and provided to the certification body. Table 3 details minimum experience related to formal education.

### 7.2.3 Vision requirements — all levels

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

- near-vision acuity shall permit reading a minimum of Jaeger number 1 or Times Roman N4.5 or equivalent letters at not less than 30 cm with one or both eyes, either corrected or uncorrected;
- colour vision shall be such that the candidate can distinguish and differentiate contrast between the colours used in the NDT method concerned as specified by the employer.

Subsequent to certification, the tests of visual acuity shall be carried out annually and be verified by the employer or the responsible agency (see 6.5.3).

Table 3 — Minimum experience requirements — level 3

Method of access	Education	Experience (months)
Access to level 3 by a certified level 2 operator	Graduate of a three year or longer accredited science or engineering college or university programme	12
	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 passed the practical examination for level 2 in that method (except for writing the NDT instruction)	Graduate of a three year or longer accredited science or engineering college or university programme	24
	Successful completion of at least two years of engineering or science study at an accredited college, university or technical school.	48
	No degree	72
NOTE If a college or university degree is issued in non-destructive testing, the experience required for access to level 3 may be reduced by 50 %.		

## 8 Qualification examination

The qualification examination shall cover a given NDT method as applied in one or more specific industrial sectors.

### 8.1 Examination content and grading for level 1 and level 2

#### 8.1.1 General examination

**8.1.1.1** The general examination shall include only questions selected from the certification body's or authorized qualifying body's collection of basic knowledge questions valid at the date of examination. The candidate shall be required, as a minimum, to give answers to the number of multiple choice questions shown in Table 4.

**8.1.1.2** The time allowed to the candidates for completion of each examination shall be based upon the number and difficulty of the questions. The average time allowed shall be no less than one and no more than two minutes per multiple choice question.

**8.1.1.3** Where not otherwise addressed by national regulations, there shall be an additional examination on radiation safety for the radiographic test method.

**8.1.1.4** Examinations on the radiographic test method may include either X- or gamma-radiation, or both, depending upon the procedure of the certification body.

**Table 4 — Required minimum number of questions — General examinations**

NDT method	Number of questions	
	Level 1	Level 2
ET	40	40
PT	30	30
MT	30	30
RT	40	40
UT	40	40

### 8.1.2 Specific examination

**8.1.2.1** The specific examination shall include only questions selected from the certification body's or authorized qualifying body's current collection of specific questions related to the industrial sector(s) concerned.

**8.1.2.2** The time allowed to the candidates for completion of each examination shall be based upon the number and difficulty of the questions. The average time allowed for multiple choice questions shall be no longer than three minutes per question. The average time allowed for written questions shall be determined by the certification body.

**8.1.2.3** During the specific examination, the candidate shall be required to give answers to at least the number of questions specified in Table 5, including questions involving calculations, written procedures and questions on codes, standards and specifications.

**8.1.2.4** If the specific examination covers two or more industrial sectors, the minimum number of questions shall be at least 30, evenly spread between the sectors concerned.

**Table 5 — Required minimum number of questions — Specific examinations**

NDT method	Number of questions	
	Level 1	Level 2
ET	20	20
PT	20	15
MT	20	15
RT	20	20
UT	20	20

### 8.1.3 Practical examination

**8.1.3.1** Each test specimen shall be uniquely identified and have a master sheet that includes all of the equipment settings used to detect discontinuities contained within the specimen. The master sheet shall be compiled based upon at least two independent tests conducted by personnel holding appropriate certification, and shall be authorized by a level 3 examiner for use in grading examinations.

**8.1.3.2** The number of areas or volumes to be tested shall be adequate to the level and NDT method, and to the industrial sector concerned, but shall not be less than two, containing reportable discontinuities. For radiography, see 8.1.3.5.

**8.1.3.3** The level 1 candidate shall follow the NDT instruction(s) provided by the examiner.

**8.1.3.4** The level 2 candidate shall select the applicable NDT technique and determine the operating conditions related to a given code, standard or specification.

**8.1.3.5** For radiographic examination, level 1 and level 2 candidates shall radiograph at least one volume in a test specimen. Level 2 candidates shall interpret at least five radiographs of test specimens in the applicable industrial sector.

**8.1.3.6** The time allowed for the examination depends on the number of test specimens and of their complexity. The recommended maximum time allowed for each area or volume tested is:

- a) for level 1, three hours;
- b) for level 2, four hours.

**8.1.3.7** Level 2 candidates shall draft at least one NDT Instruction suitable for level 1 personnel.

#### **8.1.4 Grading of the level 1 and level 2 qualification examination**

**8.1.4.1** An examiner shall be responsible for the grading of the examinations. The general, specific and practical examinations shall be graded separately.

**8.1.4.2** The examination grading should be based on items 1 to 4 in Table 6, with the recommended weighting in relation to the level.

**8.1.4.3** The certification body shall implement the passing grade criteria in a consistent manner by using one of the following two methods:

##### **8.1.4.3.1 Composite grade method**

To be eligible for certification the candidate shall obtain a minimum grade of 70 % in each examination and a minimum composite grade of 80 %. The composite grade  $N$  shall be calculated in accordance with the following formula:

$$N = 0,25n_g + 0,25n_s + 0,50n_p$$

where

$n_g$  is the grade for the general examination;

$n_s$  is the grade for the specific examination;

$n_p$  is the grade for the practical examination.

##### **8.1.4.3.2 Minimum grade method**

To be eligible for certification a candidate shall obtain a grade of at least 70 % in each of the written examinations and 80 % in the practical examination.

## **8.2 Examination content and grading for level 3**

### **8.2.1 Basic examination**

**8.2.1.1** The basic examination shall be in writing and shall assess the candidate's knowledge of the basic subjects using the minimum required number of questions shown in Table 7. Examination questions shall be selected from the certification body's or the authorized qualifying body's current collection at the time of the examination.

**8.2.1.2** The basic examination should be passed first and remains valid, providing that the first main method examination is passed within five years of passing the basic examination.

**Table 6 — Subjects and weighting factors for grading — practical examination**

Item	Subject	Weighting factor	
		Level 1	Level 2
1	Knowledge of the apparatus, including the function and verification of the setting of the apparatus.	20 %	10 %
2	The application of NDT to the test specimen. This consists of the following parts: <ul style="list-style-type: none"> <li>a) for level 2, selection of the techniques and determination of the operating conditions;</li> <li>b) the preparation (surface condition) and visual examination of the test piece;</li> <li>c) the setting up of the apparatus;</li> <li>d) the performance of the test;</li> <li>e) the operations after the test.</li> </ul>	35 %	20 %
3	The detection and reporting of the discontinuities and, for level 2, their characterization (position, orientation, dimensions and type) and evaluation.	45 %	55 %
4	For level 2, the written instruction for level 1.	—	15 %

**Table 7 — Minimum required number of basic examination questions**

Subject	Number of questions
Technical knowledge in materials science and process technology.	25
Knowledge of the certification body's qualification and certification system based on this International Standard. This may be an open book examination.	10
General knowledge of at least four methods as required for level 2 and chosen by the candidate from the methods given in Clause 1. These four methods shall comprise the principal method for which the certification is sought and three others which must include at least one volumetric method (UT or RT).	15 for each test method (total 60)

**Table 8 — Minimum required number of main method examination questions**

Symbol	Subject	Number of questions
c <sub>1</sub>	Level 3 knowledge relating to the test method.	30
c <sub>2</sub>	Application of the NDT method in the industrial sector concerned, including the applicable codes, standards, and specifications. This may be an open book examination in relation to codes, standards and specifications.	20
c <sub>3</sub>	Drafting of one or more NDT procedures in the relevant sector. The applicable codes, standards and specifications shall be available to the candidate.	—

## 8.2.2 Main method examination

**8.2.2.1** The main method examination shall be in writing and shall assess the candidate's knowledge of the main method subjects using the minimum required number of questions shown in Table 8. Examination questions shall be selected from the certification body's or authorized qualifying body's current collection at the time of the examination.

**8.2.2.2** Level 3 candidates not holding appropriate level 2 certification shall pass a relevant level 2 practical examination graded in accordance with 8.1.4 except that they need not draft an NDT instruction.

## 8.2.3 Grading of level 3 qualification examinations

The grading of the basic and main method examinations shall be done separately. To be eligible for certification, a candidate shall pass both the basic and main method examinations.

### 8.2.3.1 Basic examination

To pass the basic examination, a candidate shall obtain a minimum grade of 70 %.

### 8.2.3.2 Main method examination

To pass the main method examination, a candidate shall obtain a minimum grade of 70 % in each part and a composite grade  $N_C$  of at least 80 %.

The composite grade  $N_C$  of the main method examination shall be calculated in accordance with the following formula:

$$N_C = \frac{n_{c1} + n_{c2} + n_{c3}}{3}$$

where

$n_{c1}$  is the grade for part  $c_1$  (see Table 8);

$n_{c2}$  is the grade for part  $c_2$  (see Table 8);

$n_{c3}$  is the grade for part  $c_3$  (see Table 8).

## 8.3 Conduct of examinations

**8.3.1** All examinations shall be conducted in examination centres established, approved and monitored by the certification body, either directly or through an authorized qualifying body.

**8.3.2** At the examination, the candidate shall have in his possession valid proof of identity and an official notification of the examination, which shall be shown to the examiner or invigilator upon demand.

**8.3.3** Any candidate who, during the course of the examination, does not abide by the examination rules or who perpetrates, or is an accessory to, fraudulent conduct shall be excluded from further participation.

**8.3.4** Examinations shall be approved by an examiner. The examination shall be invigilated and evaluated by an examiner, or by one or more trained and authorized invigilators placed under the examiner's responsibility.

**8.3.5** An examiner shall be responsible for grading the examination in accordance with procedures established or approved by the certification body (see also 3.15).

**8.3.6** With the approval of the certification body a candidate for a practical examination may use his own apparatus. The specimens used in training shall not be used as test specimens.

**8.3.7** Level 3 examinations shall be set and graded by at least two examiners.

## 8.4 Re-examination

**8.4.1** A candidate failing for reasons of unethical behaviour shall wait at least one year before reapplying.

**8.4.2** A candidate who fails to obtain the pass grade required for certification may retake any of the examinations once, provided that the re-examination takes place no sooner than within 30 days, nor later than one year after the original examination. A certification body may use its discretion in allowing an earlier re-examination in the event that further training acceptable to the certification body is undertaken.

**8.4.3** A candidate failing re-examination shall apply for and take the examination in accordance with the procedure established for new candidates.

## 8.5 Examination exemptions

**8.5.1** A certified level 1 or level 2 individual changing from one industrial sector to another in the same NDT method shall be required to take only the specific examination and practical examination, for that method, concerning the new industrial sector.

**8.5.2** A certified level 3 individual changing from one industrial sector to another in the same NDT method does not need to retake the basic examination nor the level 3 knowledge part (c<sub>1</sub> of Table 8) of the main method examination.

## 9 Certification

### 9.1 Issuing of certificates

A certification body, directly or through its authorized qualifying bodies, shall issue certificates and/or corresponding wallet cards only for personnel who meet all of the requirements for certification (see note in 9.2).

### 9.2 Requirements on certificates and wallet cards

Certificates and/or corresponding wallet cards shall bear at least:

- a) the full name of the individual certified;
- b) the date of certification;
- c) the date upon which certification expires;
- d) the level of certification;
- e) reference to the certification body or to the authorized qualifying body;
- f) the NDT method(s);
- g) the industrial sector(s) concerned;
- h) a unique identification number;
- i) the signature of the individual certified;
- j) a photograph of the individual certified in case of the wallet card;
- k) the cold seal of the certification body, cancelling the photograph to avoid falsification in the case of a wallet card;
- l) the signature of a representative of the certification body or the authorized qualifying body.

**NOTE** By issuing the certificate and/or corresponding wallet card, the certification body or an authorized qualifying body attests to the qualification of the individual but does not give any operating authorization. There may be a special space on the certificate and/or wallet card for the signature of the employer or responsible agency authorizing the certificate holder to operate.

## 10 Certification validity and renewal

### 10.1 Validity

The period of validity shall not exceed five years from the date of certification indicated on the certificate and/or wallet card.

Certification shall be invalid:

- a) in any industrial sector other than that for which it was issued;
- b) at the discretion of the certification body after reviewing evidence of unethical behaviour;
- c) if the individual fails to meet the visual acuity requirements of 7.2.3;
- d) if a significant interruption takes place in the individual's work in the method for which he is certified.

### 10.2 Renewal

After the first period of validity, certification may be renewed by the certification body for a new period of similar duration, provided the certificate holder supplies documentary evidence of:

- a) satisfactorily meeting, during the preceding 12 months, the vision requirements of this International Standard and
- b) continued satisfactory work activity, relevant to the certification, without significant interruption.

If criterion b) for renewal is not met, the individual shall follow the same rules as for recertification.

### 10.3 Recertification

**10.3.1** Upon completion of each second period of validity, or at least every ten years, the certificate holder may be recertified by the certification body for a similar period, provided the individual meets the two criteria for renewal and passes a limited examination consisting of:

- a) Level 1 and level 2: a limited practical examination.
- b) Level 3: a written examination which includes:
  - at least 20 questions on the application of the test method in the industrial sector concerned and
  - at least 5 questions on the certification body's qualification and certification system based on this International Standard.

For recertification by examination in more than one method at the same time, the total number of questions may be reduced as indicated in Table 9.

**10.3.2** If the individual fails to achieve a grade of at least 80 % in the recertification examination, he shall apply for new certification.

**10.3.3** As an alternative to the level 3 recertification examination specified in 10.3.1 b), the certification body may implement a structured credit system for recertification. For guidance purposes, examples of two such systems are given in annex C.

**Table 9 — Minimum number of questions for multiple method recertification**

Number of NDT methods	Application of the method <sup>a</sup>	Qualification and certification system <sup>b</sup>
2 methods	30	5
3 methods	40	5
4 methods and more	50	5

<sup>a</sup> The questions shall be evenly spread between the different methods concerned.

<sup>b</sup> The part of the examination concerned with the qualification and certification system may be open book.

## 11 Files

The certification body or its authorized qualifying bodies shall keep:

- a) an updated list of all individuals certified, classified according to level, test method and industrial sector;
- b) an individual file under suitable conditions of safety and discretion for each certificate holder and for each person whose certification has lapsed, or has been cancelled or withdrawn. This file shall be kept for a period at least equal to the total of the initial period of validity plus the renewal period and shall contain:
  - 1) application forms;
  - 2) examination documents, including completed papers, descriptions of specimens, records, results of tests, written procedures and/or applicable NDT instructions, and grade sheets;
  - 3) renewal documents, including evidence of physical condition and continuous activity;
  - 4) reasons for any withdrawal of certification and details of any further penalty inflicted;
- c) an individual file for each candidate who has not been certified, for a period of three years from the date of application.

## Annex A (informative)

### Suggested industrial sectors

When creating an industrial sector it is recommended that the certification body take into consideration the following reference list of industrial sectors.

- a) Castings (ferrous and non-ferrous materials).
- b) Forgings (all types of forgings: ferrous and non-ferrous materials).
- c) Welds (all types of welds, including soldering, for ferrous and non-ferrous materials).
- d) Tube and pipe (seamless, welded, ferrous and non-ferrous materials).
- e) Wrought products, except forgings (plates, bar, rods).
- f) Multi-sector: combination of sectors, including all or some products for a certain application (e.g., aerospace, in-service inspection) or certain types of materials (e.g., ferrous materials, non-ferrous materials).

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