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

Essais non destructifs — Qualification et certification du personnel END

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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 2.

The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

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

This fourth edition cancels and replaces the third edition (ISO 9712:2005), which has been technically revised.

Changes from the third edition include:

- clarification of responsibilities for the certification body, the qualification body, and the examination centre;
- redrafting of the clause “training” for clarification and change in the number of required hours;
- redrafting of the clause “experience” for clarification;
- introduction of “digital certificates”;
- other minor technical and editorial changes.

Introduction

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

When certification of NDT personnel is required in product standards, regulations, codes or specifications, it is important to certify the personnel in accordance with this International Standard. When latitude is provided in the criteria within this International Standard, the certification body has the final decision in determining specific requirements.

When there is no requirement in legislation, in standard or in the order for certification of NDT personnel, it is for employers of such personnel to decide how to assure themselves that they are competent to do the work assignments. Thus, they may employ people who are already certified or they may apply their own expertise so as to assure themselves that their employee has the necessary competence. In this last case, prudent employers would no doubt use this International Standard as a reference document.

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Non-destructive testing — Qualification and certification of NDT personnel

1 Scope

This International Standard specifies requirements for principles for the qualification and certification of personnel who perform industrial non-destructive testing (NDT).

NOTE 1 The term “industrial” implies the exclusion of applications in the field of medicine.

The system specified in this International Standard can also apply to other NDT methods or to new techniques within an established NDT method, provided a comprehensive scheme of certification exists and the method or technique is covered by International, regional or national standards or the new NDT method or technique has been demonstrated to be effective to the satisfaction of the certification body.

NOTE 2 CEN/TR 14748^[5] can be used as guidance.

The certification covers proficiency in one or more of the following methods:

- a) acoustic emission testing;
- b) eddy current testing;
- c) infrared thermographic testing;
- d) leak testing (hydraulic pressure tests excluded);
- e) magnetic testing;
- f) penetrant testing;
- g) radiographic testing;
- h) strain gauge testing;
- i) ultrasonic testing;
- j) visual testing (direct unaided visual tests and visual tests carried out during the application of another NDT method are excluded).

NOTE 3 This International Standard specifies requirements for what are, in effect, third party conformity assessment schemes. These requirements do not directly apply to conformity assessment by second or first parties, but relevant parts of this International Standard can be referred to in such arrangements.

NOTE 4 Wherever gender specific words such as “his”, “her”, “he” or “she” appear in this International Standard, the other gender is also applicable.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 17024, *Conformity assessment — General requirements for bodies operating certification of persons*

3 Terms and definitions

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

3.1 authorized qualification body
body, independent of the employer, authorized by the certification body to prepare and administer qualification examinations

3.2 basic examination
written examination, at Level 3, which demonstrates the candidate's knowledge of the materials science and process technology and types of discontinuities, the specific qualification and certification system, and the basic principles of NDT methods as required for Level 2

NOTE 1 For an explanation of the three levels of qualification, see Clause 6.

NOTE 2 The qualification and certification system is specified in this International Standard.

3.3 candidate
individual seeking qualification and certification who gains experience under the supervision of personnel having a qualification acceptable to the certification body

3.4 certificate
document issued by the certification body under specified provisions, indicating that the named person has demonstrated the competence(s) defined on the certificate

NOTE The provisions are specified in this International Standard.

3.5 certification
procedure used by the certification body to confirm that the qualification requirements for a method, level and sector have been fulfilled, leading to the issuing of a certificate

3.6 certification body
body that administers procedures for certification according to specified requirements

NOTE The requirements are specified in this International Standard.

3.7 employer
organization for which the candidate works on a regular basis

NOTE An employer can also be a candidate at the same time.

3.8 examination centre
centre approved by the certification body where qualification examinations are carried out

3.9 examiner
person certified to Level 3 in the method and product or industrial sector for which he is authorized by the certification body to conduct, supervise and grade the qualification examination

3.10 general examination
written examination, at Level 1 or Level 2, concerned with the principles of an NDT method

3.11**industrial experience**

experience, acceptable to the certification body, gained under qualified supervision, in the application of the NDT method in the sector concerned, needed to acquire the skill and knowledge to fulfil the provisions of qualification

3.12**invigilator**

person authorized by the certification body to supervise examinations

3.13**job-specific training**

training, provided by the employer (or his agent) to the certificate holder in those aspects of non-destructive testing specific to the employer's products, NDT equipment, NDT procedures, and applicable codes, standards, specifications and procedures, leading to the award of operating authorizations

3.14**main-method examination**

written examination, at Level 3, which demonstrates the candidate's general and specific knowledge, and the ability to write NDT procedures for the NDT method as applied in the industrial or product sector(s) for which certification is sought

3.15**multiple choice examination question**

wording of a question giving rise to four potential replies, only one of which is correct, the remaining three being incorrect or incomplete

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3.16**NDT instruction**

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

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3.17**NDT method**

discipline applying a physical principle in non-destructive testing

EXAMPLE Ultrasonic testing.

3.18**NDT procedure**

written description of all essential parameters and precautions to be applied when non-destructively testing products in accordance with standard(s), code(s) or specification(s)

3.19**NDT technique**

specific way of utilizing an NDT method

EXAMPLE Immersion ultrasonic testing.

3.20**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 a syllabus approved by the certification body

3.21**operating authorization**

written statement issued by the employer, based upon the scope of certification, authorizing the individual to carry out defined tasks

NOTE Such authorization can be dependent on the provision of job-specific training.

3.22

practical examination

assessment of practical skills, in which the candidate demonstrates familiarity with, and the ability to perform, the test

3.23

qualification

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

3.24

qualification examination

examination, administered by the certification body or the authorized qualification body, which assesses the general, specific and practical knowledge and the skill of the candidate

3.25

qualified supervision

supervision of candidates gaining experience by NDT personnel certified in the same method under supervision or by non-certified personnel who, in the opinion of the certification body, possess the knowledge, skill, training, and experience required to properly perform such supervision

3.26

sector

particular section of industry or technology where specialized NDT practices are used, requiring specific product-related knowledge, skill, equipment or training

NOTE A sector can be interpreted to mean a product (welded products, castings) or an industry (aerospace, in-service testing). See Annex A.

3.27

significant interruption

absence or change of activity which prevents the certified individual from practising the duties corresponding to the level in the method and the sector(s) within the certified scope, for either a continuous period in excess of one year or two or more periods for a total time exceeding two years

NOTE Legal holidays or periods of sickness or courses of less than 30 days are not taken into account when calculating the interruption.

3.28

specific examination

written examination, at Level 1 or Level 2, concerned with testing techniques applied in a particular sector(s), including knowledge of the product(s) tested and of codes, standards, specifications, procedures and acceptance criteria

3.29

specification

document stating requirements

3.30

specimen

sample used in practical examinations, possibly including radiographs and data sets, which is representative of products typically tested in the applicable sector

NOTE A specimen can include more than one area or volume to be tested.

3.31

specimen master report

model answer, indicating the optimum result for a practical examination given a defined set of conditions (equipment type, settings, technique, specimen, etc.) against which the candidate's test report is graded

3.32**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

3.33**validation**

act of demonstrating that a verified procedure works in practice and fulfils its intended function, normally achieved by actual witnessing, demonstration, field or laboratory tests or selected trials

3.34**renewal**

procedure for revalidation of a certificate without examination at any time up to five years after success in an initial, supplementary or recertification examination

3.35**recertification**

procedure for revalidation of a certificate by examination or by otherwise satisfying the certification body that the published criteria for recertification are satisfied

4 Methods and abbreviated terms

For the purposes of this International Standard, the abbreviated terms listed in Table 1 are used to identify NDT methods.

Table 1 — Methods and abbreviated terms
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NDT method	Abbreviated terms
Acoustic emission testing	AT
Eddy current testing	ET
Infrared thermographic testing	TT
Leak testing	LT
Magnetic testing	MT
Penetrant testing	PT
Radiographic testing	RT
Strain gauge testing	ST
Ultrasonic testing	UT
Visual testing	VT

5 Responsibilities**5.1 General**

The certification system, which shall be controlled and administered by a certification body (with the assistance, where necessary, of authorized qualification bodies), includes all procedures necessary to demonstrate the qualification of an individual to carry out tasks in a specific NDT method and product or industrial sector, leading to certification of competence.

5.2 Certification body

5.2.1 The certification body shall fulfil the requirements of ISO/IEC 17024.

5.2.2 The certification body:

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- a) shall initiate, promote, maintain and administer the certification scheme according to ISO/IEC 17024 and this International Standard;
- b) shall publish specifications for training courses that include the syllabi which embody the content of recognized documents, e.g. ISO/TR 25107^[2] or equivalent;
- c) may delegate, under its direct responsibility, the detailed administration of qualification to authorized qualification bodies, to which it shall issue specifications and/or procedures covering facilities, personnel, calibration and control of NDT equipment, examination materials, specimens, conduct of examinations, examination grading, records, etc.;
- d) shall conduct an initial audit and subsequent periodic surveillance audits of the authorized qualification body(ies) to ensure their conformity to the specifications;
- e) shall monitor, in accordance with a documented procedure, all delegated functions;
- f) shall approve properly staffed and equipped examination centres which it shall monitor on a periodic basis;
- g) shall establish an appropriate system for the maintenance of records, which shall be retained for at least one certification cycle (10 years);
- h) shall be responsible for the issue of all certificates;
- i) shall be responsible for the definition of sectors (see Annex A);
- j) shall be responsible for ensuring the security of all examination materials (specimens, master reports, question banks, examination papers, etc.) and shall ensure that specimens are not in use for training purposes;
- k) shall require all candidates and certificate holders to give a signed or stamped undertaking to abide by a code of ethics which it shall develop for the purpose and publish.

5.3 Authorized qualification body

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5.3.1 Where established, the authorized qualification body shall:

- a) work under the control of and apply the specifications issued by the certification body;
- b) be independent of any single predominant interest;
- c) ensure that it is impartial with respect to each candidate seeking qualification, bringing to the attention of the certification body any actual or potential threat to its impartiality;
- d) apply a documented quality management system approved by the certification body;
- e) have the resources and expertise necessary to establish, monitor and control examinations centres, including examinations and the calibration and control of the equipment;
- f) prepare, supervise and administer examinations under the responsibility of an examiner authorized by the certification body;
- g) maintain appropriate qualification and examination records according to the requirements of the certification body.

5.3.2 If there are no authorized qualification bodies, the certification body shall fulfil the requirements of the qualification body.

5.4 Examination centre

5.4.1 The examination centre shall:

- a) work under the control of the certification body or authorized qualification body;