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## 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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

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

This fifth edition cancels and replaces the fourth edition (ISO 9712:2012), which has been technically revised.

The main changes compared to the previous edition are as follows:

- clarification of responsibilities for the certification body, the authorized qualification body, the examination centre and the employer;
- additions and revisions to definitions;
- defined responsibilities for examiners and referees
- revised requirements for the duration of training and industrial experience;
- modified requirements for visual acuity testing;
- revised requirements for examinations;
- included an option for the use of a psychometric process at the discretion of the certification body;
- revised the requirements for the certification documents;
- revised requirements for the conditions of certification;
- additional requirements for candidates for the renewal of certificates;
- revised structured credit system for Level 3 recertification;
- includes new [Annex F](#) for techniques;
- includes new [Annex G](#) for psychometric principles;

— other minor technical and editorial changes.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

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## 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 document. When latitude is provided in the criteria within this document, 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 document as a reference document.

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

## 1 Scope

This document specifies requirements for the qualification and certification of personnel who perform industrial non-destructive testing (NDT) in the following methods.

- a) acoustic emission testing;
- b) eddy current testing;
- c) 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).

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

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

NOTE 2 CEN/TR 14748 provides guidance for methodology for qualification of NDT systems.

NOTE 3 This document 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 document can be referred to in such arrangements.

NOTE 4 The term "direct unaided visual testing" implies where there is an uninterrupted optical path from the observer's eye to the test area and the observer uses no tools or devices (e.g. mirror, lens, endoscope, fibre optic, etc...).

NOTE 5 Calculations of strain based on other NDT methods are excluded.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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*

ISO 18490, *Non-destructive testing — Evaluation of vision acuity of NDT personnel*

### 3 Terms and definitions

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

- 3.1 applicant**  
person who has submitted an application to be admitted into the certification process
- 3.2 authorized qualification body**  
body, independent of the employer, authorized by the certification body to prepare and administer examinations
- 3.3 basic examination element**  
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 to entry: Note 1 to entry: For an explanation of the three levels of qualification, see [Clause 6](#).
- Note 2 to entry: The qualification and certification system is specified in this document.
- 3.4 candidate**  
applicant who has fulfilled specified prerequisites and has been admitted to the certification process
- 3.5 certificate**  
a document in the form of a letter, card or other medium (e.g. digital certificate), issued by a certification body under the provisions of this document, indicating that the named person has fulfilled the certification requirements <https://standards.iteh.ai/catalog/standards/sist/6d9e3aab-faa3-4d2c-8a30-8e50bb748d3f/iso-dis-9712>
- 3.6 certification body**  
body that administers procedures for certification according to specified requirements
- 3.7 certification cycle**  
the maximum period of time permitted from the date of certification to the date of recertification inclusive of the renewal period
- 3.8 certification process**  
activities by which a certification body determines that a person fulfils certification requirements, including application, assessment, decision on certification, renewal, recertification and use of certificates and logos/marks
- 3.9 certification requirements**  
set of specified requirements, including requirements of the scheme to be fulfilled in order to establish or maintain certification
- 3.10 competence**  
ability to apply knowledge and skills to achieve intended results

**3.11****employer**

legal entity by whom the candidate is employed

Note 1 to entry: a candidate may be self-employed

**3.12****examination**

mechanism that is part of the assessment which measures a candidate's competence by one or more means

**3.13****examination centre**

centre approved by the certification body where examinations are carried out

**3.14****examination elements**

a component of an examination

**3.15****examiner**

person competent to conduct and score an examination, where the examination requires professional judgement

**3.16****general examination element**

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

**3.17****higher education**

formal learning that occurs after completion of secondary education in the field of engineering or science

**3.18****industrial experience**

work activities performed under supervision, in the NDT method in the sector concerned, needed to acquire the skill and knowledge to fulfil the provisions of qualification

**3.19****invigilator**

person authorized by the certification body who supervises an examination, but does not evaluate the competence of the candidate

Note 1 to entry: Other terms for invigilator are proctor, test administrator.

**3.20****job-specific training**

training, provided by the employer (or their 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

**3.21****main method examination element**

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

**3.22****multiple choice examination question**

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

**3.23**

**NDT instruction**

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

**3.24**

**NDT method**

discipline applying a physical principle in non-destructive testing

EXAMPLE Ultrasonic testing.

**3.25**

**NDT personnel**

personnel who perform non-destructive testing (NDT)

**3.26**

**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)

**3.27**

**NDT technique**

specific way of utilizing an NDT method

**3.28**

**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

**3.29**

**operating authorization**

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

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Note 1 to entry: Such authorization can be dependent on the provision of job-specific training.

**3.30**

**practical examination element**

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

**3.31**

**psychometrics process**

a statistical process to verify qualification/certification examinations are fair, reliable and discriminate between a competent and non-competent individual

**3.32**

**qualification**

demonstrated education, training and work experience

**3.33**

**sector**

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

Note 1 to entry: A sector can be interpreted to mean a product (welded products, castings) or an industry (aerospace, in-service testing). See [Annex A](#).

**3.34****significant interruption**

absence or change of work 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 1 to entry: Legal holidays or periods of sickness or training courses of less than 30 days are not taken into account when calculating the interruption.

**3.35****specific examination element**

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

**3.36****specification**

document stating requirements

**3.37****specimen**

sample used in practical examinations, possibly including radiographs and data sets, which is representative of products typically tested in the applicable sector. A specimen can include more than one area or volume to be tested.

**3.38****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

**3.39****structured credit system**

point system based on the NDT activities of the candidate used as an alternative to examination for renewal or recertification

**3.40****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

**3.41****recertification**

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

**3.42****referee**

an individual that attests the validity of the candidate's industrial experience

**3.43****renewal**

process for revalidation of a certification at any time up to five years after success in an initial, supplementary or recertification examination

**3.44****work activities**

performance of NDT related functions and tasks (see [section 6](#))