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**Neporušitveno preskušanje - Kvalificiranje in certificiranje osebja - Splošna načela (prevzet standard EN 473:2000 z metodo platnice)**

Non destructive testing - Qualification and certification of NDT personnel - General principles

Essais non destructifs - Qualification et certification du personnel END - Principes généraux

Zerstörungsfreie Prüfung - Qualifizierung und Zertifizierung von Personal der zerstörungsfreien Prüfung - Allgemeine Grundlagen

## iTeh STANDARD PREVIEW

Deskriptorji: neporušitveno preskušanje, osebje, kvalificiranje, certificiranje, definicije  
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SIST EN 473:2001 ((sl),en)

Nadaljevanje na straneh od II do III in od 1 do 31

## NACIONALNI UVOD

Standard SIST EN 473 ((sl),en), Neporušitveno preskušanje - Kvalificiranje in certificiranje osebja - Splošna načela, druga izdaja, 2001, ima status slovenskega standarda in je z metodo platnice prevzet evropski standard EN 473 (en), Non destructive testing - Qualification and certification of NDT personnel - General principles, 2000-10.

## NACIONALNI PREDGOVOR

Evropski standard EN 473:2000 je pripravil tehnični odbor Evropske organizacije za standardizacijo CEN/TC 138 Neporušitvene preiskave.

Odločitev za prevzem tega standarda po metodi platnice je dne 2001-05-10 sprejel tehnični odbor USM/TC PKG Preskušanje kovinskih gradiv.

## ZVEZA S STANDARDOM

S prevzemom tega evropskega standarda veljajo za omejeni namen referenčnih standardov vsi standardi, navedeni v izvirniku, razen tistega, ki smo ga že sprejeli v nacionalno standardizacijo:

SIST EN 45013:1996 (sl)                      Splošni kriteriji za certifikacijske organe za področje certificiranja osebja

## PREDHODNA IZDAJA

SIST EN EN 473:1996 ((sl),en)              Kvalificiranje in certificiranje osebja za neporušitvene preiskave - Splošna načela

## OPOMBI

- Povsod, kjer se v besedilu standarda uporablja izraz "evropski standard", v SIST EN 473:2001 to pomeni "slovenski standard".
- Nacionalni uvod in nacionalni predgovor nista sestavni del standarda.

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<b>VSEBINA</b>	<b>Stran</b>
Predgovor.....	3
1 Namen.....	4
2 Zveze s standardi.....	4
3 Izrazi in definicije.....	4
4 Metode in simboli.....	7
5 Splošna načela.....	7
6 Primernost za certificiranje.....	11
7 Izpit za kvalifikacijo.....	14
8 Certificiranje.....	19
9 Obnovitev.....	20
10 Recertificiranje.....	20
11 Arhiv.....	21
12 Prehodno obdobje.....	21
Dodatek A (informativni): Sektorji.....	22
Dodatek B (normativni): Najmanjše število in vrsta preskušancev za 1. In 2. stopnjo pri praktičnem delu izpita.....	23
Dodatek C (normativni): Točkovalni sistem za recertificiranje 3. stopnje.....	25
Dodatek D (informativni): Vodilo za vsebino osnovnega poročila o preskušancih (navaja diskontinuitete, o katerih mora kandidat poročati, da bo certificiran).....	27
Dodatek ZA (informativni): Točke tega evropskega standarda, ki obravnavajo bistvene zahteve ali druga določila direktiv EU.....	30
Bibliografija.....	31

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[SIST EN 473:2001](https://standards.iteh.ai/catalog/standards/sist/f652aa28-6ea4-47e6-a56f-53de0b7e1e1c/sist-en-473-2001)

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English version

## Non destructive testing - Qualification and certification of NDT personnel - General principles

Essais non destructifs - Qualification et certification du  
personnel END - Principes généraux

Zerstörungsfreie Prüfung - Qualifizierung und Zertifizierung  
von Personal der zerstörungsfreien Prüfung - Allgemeine  
Grundlagen

This European Standard was approved by CEN on 17 September 2000.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Contents

	Page
Foreword.....	3
1 Scope .....	4
2 Normative references .....	4
3 Terms and definitions.....	4
4 Methods and symbols .....	7
5 General principles.....	7
6 Eligibility for certification.....	11
7 Qualification examination .....	14
8 Certification .....	19
9 Renewal.....	20
10 Recertification .....	20
11 Files .....	21
12 Transition period.....	21
Annex A (informative) Sectors .....	22
Annex B (normative) Minimum number and type of test specimens for the levels 1 and 2 practical examination .....	23
Annex C (normative) Structured credit system for level 3 recertification.....	25
Annex D (informative) Guidance on the content of test specimen master reports (indicating the discontinuities which the candidate shall report in order to be certificated) .....	27
Annex ZA (informative) Clauses of this European Standard addressing essential requirements or other provisions of EU Directives .....	30
Bibliography .....	31

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**(standards.iteh.ai)**

[SIST EN 473:2001](https://standards.iteh.ai/catalog/standards/sist/f652aa28-6ea4-47e6-a56f-53de0b7e1e1c/sist-en-473-2001)

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## Foreword

This European Standard has been prepared by Technical Committee CEN/TC 138 "Non-destructive testing", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2001, and conflicting national standards shall be withdrawn at the latest by April 2001.

This European Standard supersedes EN 473:1993.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this standard.

The annexes A and D are informative ; the annexes B and C are normative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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## 1 Scope

This European Standard establishes a system for the qualification and certification of personnel who perform industrial non destructive testing (NDT). The term 'industrial' implies the exclusion of applications in the field of medicine.

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

When certification of NDT personnel is defined in product standards, regulations, codes or specifications, it is recommended to certify the personnel in accordance with this EN 473.

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

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

The system described in this standard can also apply to other NDT methods provided an approved programme of certification exists.

## 2 Normative references

This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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

## 3 Terms and definitions

[SIST EN 473:2001](#)

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For the purposes of this European Standard, the following terms and definitions apply:

### 3.1

#### **qualification**

evidence of training, professional knowledge, skill and experience as well as physical fitness to enable NDT personnel to properly perform NDT tasks

### 3.2

#### **certification**

procedure used to demonstrate the qualification of NDT personnel in a method, level and sector, and leading to the issue of a certificate. Certification does not include operating authorisation



### 3.3

#### **certification body**

body that administers procedures for certification of NDT personnel according to the requirements of this standard and which fulfils the requirements of EN 45013

### 3.4

#### **authorised qualifying body**

body, independent of any single predominant interest, authorised by the certification body to prepare and administer examinations to qualify NDT personnel.

NOTE :The authorised qualifying body constitutes one of the elements of the system governed by the certification body

### 3.5

#### **examination centre**

centre approved by the certification body where qualification examinations will be carried out

NOTE : The examination centre constitutes one of the elements of the system governed by the certification body

### 3.6

#### **examiner**

a person certificated to level 3 in the method he is to examine and authorised by the certification body to conduct, supervise and grade NDT qualification examinations

### 3.7

#### **certificate**

document issued under the rules of the certification system defined in this standard indicating that adequate confidence is provided that the named person is competent to perform the NDT tasks defined on the certificate

### 3.8

#### **NDT candidate**

individual seeking qualification and certification and who works under the supervision of suitably qualified personnel while gaining appropriate experience for qualification (see clause 3.24)

### 3.9

#### **employer**

organisation for which the candidate works on a regular basis; an employer can also be a candidate at the same time

### 3.10

#### **operating authorisation**

written statement issued by the employer based on the individual's competence as specified by the certificate. In addition to the certification, amongst other factors, the job-specific knowledge, skill and physical ability should be assessed for the specific task

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### 3.11

#### **NDT method**

discipline applying a physical principle in non destructive testing (for example: ultrasonic testing)

[SIST EN 473:2001](#)

### 3.12

#### **NDT technique**

specific way of utilising an NDT method (for example: ultrasonic immersion technique)

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### 3.13

#### **NDT procedure**

written description of all essential parameters and precautions to be observed when applying an NDT technique to a specific test, following an established standard, code or specification. An NDT procedure can involve the application of more than one NDT method or technique

### 3.14

#### **NDT instruction**

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

**3.15**  
**specification**  
document stating requirements

[ISO 8402:1994]

**3.16**  
**sector**  
particular section of industry or technology where specialised NDT practices are used requiring specific product related knowledge, skill, equipment or training. A sector can be interpreted to mean a product (welded products, castings...) or an industry (aerospace, in-service testing...) (see annexe A)

**3.17**  
**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

**3.18**  
**qualification examination**  
examination administered by the certification body or the authorised qualifying body, which assesses the general, specific and practical knowledge and the skill of the candidate

**3.19**  
**general examination**  
examination which is concerned with the principles of an NDT method

**3.20**  
**specific examinations**  
examination which is concerned with testing techniques applied in a particular sector, knowledge of the product being tested, and of standards, codes, specifications and acceptance criteria

**3.21**  
**(a) practical examination (levels 1 and 2)**  
examination of practical skills, in which the candidate demonstrates familiarity with, and the ability to operate the test equipment

**3.21**  
**(b) practical examination (level 3)**  
examination in which the level 3 candidate demonstrates the ability to draft one or more NDT procedures

**3.22**  
**basic examination**  
examination, at level 3, which demonstrates the candidate's knowledge of the materials science and technology in relation to the field of activity of the candidate, of this qualification and certification system, and of the theoretical principles at level 2

**3.23**  
**main NDT method examination**  
examination, at level 3, in which the candidate demonstrates knowledge of the general and specific theory of the main NDT method, and the ability to write an NDT procedure

**3.24**  
**industrial NDT experience**  
experience in the applicable NDT method and field of application concerned, which leads to the required skill and knowledge

### 3.25

#### significant interruption

absence or change of activity which prevents the certificated individual from practising the duties corresponding to his level in the method and the sector(s) for which he is certified, for

- (a) a continuous period in excess of 365 days or
- (b) two or more periods for a total time exceeding two fifths of the total period of validity of the certificate

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

### 3.26

#### test specimen

sample used in practical examinations. Samples should be representative of products typically tested in the applicable sector and can include more than one area or volume to be tested

## 4 Methods and symbols

For the purposes of this European standard, the following symbols are used to identify the NDT methods.

Table 1 – Methods and symbols

NDT Method	Symbol
Acoustic emission testing	AT
Eddy current testing	ET
Leak testing	LT
Magnetic particle testing	MT
Penetrant testing	PT
Radiographic testing	RT
Ultrasonic testing	UT
Visual testing	VT

## 5 General principles

5.1 Requirements concerning the certification body, the authorised qualifying body and the examination centre.

5.1.1 The certification body shall fulfil the requirements of EN 45013.

5.1.2 Where established, the authorised qualifying body shall :

- a) work under the control of the certification body ;
- b) have the resources needed to administer examinations at examination centres, including the calibration and control of equipment ;
- c) prepare and supervise examinations under the responsibility of an examiner authorised by the Certification Body ;
- d) be independent of any single predominant interest ;
- e) apply a documented quality management system approved by the certification body ;
- f) have the resources and expertise necessary to establish examination centres ;
- g) ensure that test specimens are not in use for training purposes.

When an authorised qualifying body covers an sector, the authorised qualifying body shall be comprised of more than one company active in the sector concerned.

If there are no authorised qualifying bodies, the certification body shall fulfil the requirements of the qualifying body.

**5.1.3** The examination centre shall :

- a) work under the control of the certification body or authorised qualifying body ;
- b) apply a documented quality procedure approved by the certification body ;
- c) have the resources needed to administer examinations, including the calibration and control of equipment ;
- d) prepare and conduct examinations under responsibility of an examiner authorised by the certification body ;
- e) ensure that test specimens are not in use for training purposes.

## **5.2 Duties and responsibilities**

### **5.2.1 Certification body**

The certification body:

- a) shall initiate, promote, maintain and administer the certification scheme according to this standard ;
- b) may delegate, under its direct responsibility, the detailed administration of the qualification procedure to authorised qualifying bodies, which could represent sectors ;
- c) shall approve properly staffed and equipped examination centres which it shall monitor on a periodic basis ;
- d) shall establish an appropriate system for the maintenance of records, which shall be retained for at least one certification cycle (10 years) ;
- e) shall be responsible for the issue of all certificates, but may delegate the preparation of level 1 and level 2 certificates to Authorised Qualifying Bodies ;
- f) shall be responsible for the definition of sectors (see annex A) ;
- g) shall monitor, in accordance with a documented procedure, all delegated functions.

### **5.2.2 Authorised qualifying bodies**

Where established, the authorised qualifying body shall:

- a) apply the documented quality procedure of the certification body;
- 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.

### **5.2.3 Examination centre**

An examination centre can be situated at an employer's premises. In this case, examinations shall be conducted only in the presence of, and under the control of, an authorised representative of the certification body.

Any examination centre shall:

- a) have adequate qualified staff, premises and equipment to ensure satisfactory qualification examinations for the levels, methods, and sectors concerned;