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Steel — Non-destructive testing —

Part 13: Employer's qualification system of non-destructive testing personnel for steel products

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Acier — Essais non destructifs —

Partie 13: Système de qualification, par l'employeur, du personnel d'essais non destructifs pour les produits en acier

ISO/FDIS 10893-13

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Contents

Page

Foreword.....	iv
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 General principles.....	3
5 Levels of qualification	4
5.1 General.....	4
5.2 NDT Level 1	4
5.3 NDT Level 2	4
6 Requirements and procedures for qualification by employer	5
7 Qualification requirements	5
7.1 General.....	5
7.2 Vision requirements	5
7.3 Training.....	5
7.4 Industrial experience	6
8 Qualification examination	7
8.1 General.....	7
8.2 Examination content	7
8.3 Conducting the examinations	9
8.4 Grading	9
8.5 Re-examination	10
9 Qualification record	10
9.1 General.....	10
9.2 Content of the document	10
9.3 Validity	10
9.4 Renewal	11
9.5 Requalification	11
10 Files	11
11 Introduction of new NDT methods, sectors or products	12
Annex A (informative) Guidance on training course content	14
Annex B (informative) Weighting of practical examination	15

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.

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ISO 10893-13 was prepared by Technical Committee ISO/TC 17, *Steel*, Subcommittee SC 19, *Technical delivery conditions for steel tubes for pressure purposes*.

ISO 10893-13 cancels and replaces ISO 11484:1994, which has been technically revised.

ISO 10893 consists of the following parts, under the general title *Steel — Non-destructive testing*.

The following parts are under preparation:

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- *Part 1: Automatic electromagnetic testing of seamless and welded (except submerged arc-welded) steel tubes for the verification of hydraulic leak-tightness*
- *Part 2: Automatic eddy current testing of seamless and welded (except submerged arc-welded) steel tubes for the detection of imperfections*
- *Part 3: Automatic full peripheral flux leakage testing of seamless and welded (except submerged arc-welded) ferromagnetic steel tubes for the detection of longitudinal and/or transversal imperfections*
- *Part 4: Liquid penetrant inspection of seamless and welded steel tubes for the detection of surface imperfections*
- *Part 5: Magnetic particle inspection of seamless and welded ferromagnetic steel tubes for the detection of surface imperfections*
- *Part 6: Radiographic testing of the weld seam of welded steel tubes for the detection of imperfections*
- *Part 7: Digital radiographic testing of the weld seam of welded steel tubes for the detection of imperfections*
- *Part 8: Automatic ultrasonic testing of seamless and welded steel tubes for the detection of laminar imperfections*
- *Part 9: Automatic ultrasonic testing of strips/plates used in the manufacture of welded steel tubes for the detection of laminar imperfections*

- *Part 10: Automatic full peripheral ultrasonic testing of seamless and welded (except submerged arc-welded) steel tubes for the detection of longitudinal and/or transversal imperfections*
- *Part 11: Automatic ultrasonic testing of weld seam of welded steel tubes for the detection of longitudinal and/or transversal imperfections*
- *Part 12: Automatic full peripheral ultrasonic thickness testing of seamless and welded (except submerged arc-welded) steel tubes*
- *Part 14: Automatic eddy current testing of seamless and welded (except submerged arc-welded) austenitic and austenitic-ferritic steel tubes for verification of hydraulic leak-tightness*

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Introduction

This part of ISO 10893 concerns the qualification of personnel engaged in non-destructive testing (NDT) of steel products.

It has been recognized that, within the steel industry worldwide, there is a predominance of semi-automatic/automatic NDT equipment in use by NDT personnel to establish product integrity, as opposed to principally manual methods adopted in other industrial sectors. As a result, this part of ISO 10893 permits employer qualification, subject to certain restrictions.

In the preparation of this part of ISO 10893, the requirements of ISO 9712 have been taken into account or adopted where they apply. However, it should be noted that the primary job-specific nature of the NDT tasks performed by NDT personnel on steel products is clearly outside the scope of ISO 9712 (see 3.13 of ISO 9712:2005).

Thus, in the context of this part of ISO 10893, the requirements of ISO 9712 should not be taken as basic or additional minimum requirements, but this does not preclude the right of any individual to apply for and obtain qualification/certification in conformance with ISO 9712, as may be appropriate in another sector.

It is recognized that this part of ISO 10893 may be applied to steel products and other specific product areas, as appropriate.

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Steel — Non-destructive testing —

Part 13:

Employer's qualification system of non-destructive testing personnel for steel products

1 Scope

1.1 This part of ISO 10893 describes an employer's qualification system for non-destructive testing (NDT) personnel performing the inspection of the following steel products under the employer's responsibility:

- tubes/pipes (seamless or welded);
- flat products, long products, rails, bars, sections, rod, wire.

1.2 This part of ISO 10893 describes qualification requirements for Level 1 and Level 2 of NDT personnel competence to execute specific tasks in the NDT of steel products. The qualification is issued by the employer for a specific product and a specific method.

1.3 This part of ISO 10893 is intended to apply to NDT personnel performing predominantly automated inspection of steel products, using any of the following NDT methods:

- 1) eddy current testing (ET);
- 2) flux leakage testing (FT);
- 3) leak testing (LT);
- 4) liquid penetrant testing (PT);
- 5) magnetic particle testing (MT);
- 6) radiographic testing (RT);
- 7) ultrasonic testing (UT);
- 8) visual inspection testing (VT).

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 9712, *Non-destructive testing — Qualification and certification of personnel*

3 Terms and definitions

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

3.1 qualification

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

[ISO 9712:2005]

3.2 qualifying body

body or department independent from that of production of authorized by the employer to undertake the preparation and administration of examinations

NOTE The qualifying body can also be an external organization operating under the mandate of the employer.

3.3 employer

organization for which the candidate works on a regular basis

[ISO 9712:2005]

3.4 candidate

an individual seeking qualification

3.5 set-up

mechanical and/or electronic adjustment of NDT equipment to establish the testing parameters and testing sensitivity required by the product specification

3.6 NDT method

discipline applying a physical principle in non-destructive testing

[ISO 9712:2005]

EXAMPLE Ultrasonic testing.

3.7 NDT technique

specific way of utilizing an NDT method

[ISO 9712:2005]

EXAMPLE Immersion ultrasonic testing.

3.8 capability

ability and/or skill to execute a specific NDT task

3.9 competence

product knowledge and capability to carry out a specific NDT task

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3.10**Level 3 individual**

person certified to Level 3, in accordance with ISO 9712 or equivalent, in the method and product for which he/she is authorized by the qualifying body to conduct, supervise and grade the qualification examination

3.11**general examination**

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

[ISO 9712:2005]

3.12**significant interruption**

absence that prevents the qualified individual from practising the duties corresponding to the level in the relevant method for a continuous period in excess of 1 year or a number of periods for a total time exceeding 2 years

3.13**specific examination**

written examination, at Level 1 or 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

[ISO 9712:2005]

4 General principles

4.1 Under the requirements of this part of ISO 10893, the employer has sole responsibility for providing a declaration of competence that a person in its employ performing NDT tasks has a prerequisite qualification and has successfully passed qualification examinations, conducted under the auspices of the employer, in one or more of the NDT methods covered by this part of ISO 10893, in respect of one of the two levels of competence (Level 1 or Level 2).

As an alternative to the use of qualified Levels 1 and/or 2 personnel in the regular employ of the employer to carry out the required NDT operations, the employer is permitted to engage, on a contract basis, certified Level 1 or Level 2 personnel in accordance with ISO 9712 or equivalent.

In addition, a certified Level 3 individual, either in the regular employ of, or engaged by, the employer, has the responsibility for administering Level 1 and Level 2 personnel qualification examinations.

4.2 The prerequisite qualification requirements, in terms of visual acuity, basic education, training and experience, shall be fulfilled by each candidate for eligibility for the qualification examinations. These prerequisite requirements shall be verified by the employer and endorsed on the qualification record.

4.3 The qualification examination for Level 1 and Level 2 personnel shall consist of three parts; a written general part, a written specific examination and a practical examination.

4.4 The general, specific and practical examinations of the qualification examination shall be conducted, at the employer's discretion, either by the employer's qualifying body or by the employer's authorized/approved external qualifying body.

4.5 The employer's qualifying body shall be constituted by individuals independent of the production departments. These individuals form an independent examining body, including at least one certified Level 3 individual not necessarily in the employ of the employer but nominated by the employer's qualifying body as an examiner for Level 1 and 2 personnel.

Such a certified Level 3 individual shall be responsible for administering Level 1 and Level 2 personnel qualification examinations and their proper conduct.

Employer authorized/approved external qualifying bodies shall also meet these basic requirements.

4.6 The qualification examination results shall be checked/verified by the qualifying body to ensure that the pass-mark requirements have been fulfilled and the employer's qualifying body, on the qualifying body's recommendation, shall issue a qualification record in respect of the individual, with regard to the NDT method and level of competence (Level 1 or 2). The issue of the qualification record provides the individual with the authorization to carry out specified NDT tasks within the employer's production facilities (i.e. authorization to operate).

This qualification record is thus only valid while the individual is in the employ of, or engaged by, the employer issuing the qualification record.

4.7 The activities for qualification up to the issue of a qualification record shall be specified in a written procedure.

5 Levels of qualification

5.1 General

NDT personnel qualified in accordance with this part of ISO 10893 shall be classified in one of two levels of competence (Level 1 or Level 2) with respect to specific NDT tasks to be performed.

Both levels of competence are defined in terms of the NDT task content, degree of responsibility, etc. in accordance with 5.2 and 5.3.

5.2 NDT Level 1

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An individual qualified to NDT Level 1 shall have demonstrated competence to carry out NDT according to NDT instruction and under the supervision of qualified Level 2 or certified Level 3 personnel. Within the scope of the competence defined on the qualification, Level 1 personnel may be authorized by the employer to

- set up the NDT equipment,
- carry out the tests,
- record and classify the results of the tests in terms of written criteria, and
- report the results.

He/she shall not be responsible for the choice of the test method or technique to be used, or for the assessment of test results.

5.3 NDT Level 2

An individual qualified to NDT Level 2 shall have demonstrated competence to perform NDT according to established procedures in the test method in which he/she is qualified. Within the scope of the competence defined for the qualification, Level 2 personnel may be authorized by the employer to

- select the NDT technique for the test method to be used,
- define the limitations of application of the testing method/technique(s),
- interpret NDT codes, standards, specifications and procedures into practical testing instructions adapted to the actual working conditions,
- set up and verify equipment settings,
- perform and supervise the tests,

- interpret and evaluate results according to applicable codes, standards, or specifications,
- prepare written NDT instructions,
- carry out and supervise all tasks at or below Level 2,
- provide guidance for personnel at or below Level 2,
- organize and report the results of NDT tests.

6 Requirements and procedures for qualification by employer

The qualifying body, through the authorized certified Level 3 individual, shall qualify NDT Level 1 and Level 2 candidates in accordance with Clauses 7 and 8. Once the candidate has been qualified, the employer shall issue the “qualification record”.

NOTE The Level 3 individual need not be in the permanent employment of the employer.

7 Qualification requirements

7.1 General

The candidate shall fulfil the following requirements of vision and training prior to the qualification examination, and for industrial experience prior to qualification.

7.2 Vision requirements

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

- 1) near-vision acuity shall permit reading, a minimum of Times Roman N4.5 or equivalent letters (Times New Roman of 4.5 points vertical height where 1 point = 0,352 8 mm or 1/72 in) at not less than 30 cm with one or both eyes, either corrected or uncorrected;
- 2) colour vision shall be sufficient that the candidate can distinguish contrast between the colours used in the NDT method concerned, as specified by the employer.

7.2.2 Subsequent to qualification, the tests of visual acuity and colour vision shall be carried out annually and be verified by the employer.

7.3 Training

7.3.1 The candidate shall provide evidence that a course of training in the method and level for which the qualification is sought has been satisfactorily completed, and is in accordance with the requirements of the qualifying body approved by the employer.

7.3.2 Annex A provides guidance on the training course content.

7.3.3 The minimum duration of training undertaken by the candidate for qualification shall be as defined in Table 1 for the applicable NDT method.