SLOVENSKI STANDARD
SIST EN 10246-9:2000

01-november-2000

Neporuġitveno preskuġanje jeklenih cevi - 9. del: Ugotavljanje vzdolġnih in/ali preļnih napak vara pri jeklenih ceveh, obloļno varjenih pod praġkom, z avtomatsko ultrazvoļno preiskavo

Non-destructive testing of steel tubes - Part 9: Automatic ultrasonic testing of the weld seam of submerged arc welded steel tubes for the detection of longitudinal and/or transverse imperfections

Zerstörungsfreie Prüfung von Stahlrohren - Teil 9: Automatische Ultraschallprüfung der Schweißnaht unterpulvergeschweißter Stahlrohre zum Nachweis von Längs- und/oder Querfehlern

Essais non destructifs des tubes en acier - Partie 9: Contrôle automatique par ultrasons du cordon de soudure pour la détection des imperfections longitudinales et/ou transversales des tubes soudés a l'arc immergé sous flux en poudre

Ta slovenski standard je istoveten z: **EN 10246-9:2000**

ICS:

23.040.10	Železne in jeklene cevi	Iron and steel pipes
25.160.40	Varjeni spoji in vari	Welded joints
77.040.20	Neporušitveno preskušanje kovin	Non-destructive testing of metals

SIST EN 10246-9:2000 **en**

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 10246-9

February 2000

ICS 23.040.10; 25.160.40; 77.040.20

English version

Non-destructive testing of steel tubes – Part 9: Automatic ultrasonic testing of the weld seam of submerged arc welded steel tubes for the detection of longitudinal and/or transverse imperfections

Essais non destructifs des tubes en acier – Partie 9: Contrôle automatique par ultrasons du cordon de soudure pour la détection des imperfections longitudinales et/ou transversales des tubes soudés à l'arc immergé sous flux en poudre

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This European Standard was approved by CEN on 25 December 1999.

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.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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FOREWORD

This European Standard has been prepared by Technical Committee ECISS/TC 29, Steel tubes and fittings for steel tubes, the Secretariat of which is held by UNI.

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 August 2000, and conflicting national standards shall be withdrawn at the latest by August 2000.

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.

1 SCOPE

This part of EN 10246 specifies the requirements for the automatic ultrasonic testing of the weld seam of submerged arc-welded (longitudinally or helically) tubes for the detection of imperfections oriented predominantly parallel to and/or at right angles to the weld seam. The standard specifies acceptance levels and calibration procedures.

European Standard EN 10246, Non-destructive testing of steel tubes, comprises the parts shown in Annex A.

2 NORMATIVE REFERENCES

This part of EN 10246 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 those publications apply to this part of EN 10246 only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

prEN 10246-10:1999	Non-destructive testing of steel tubes - Part 10: Radiographic testing of the weld seam of automatic fusion arc welded steel tubes for the detection of imperfections
EN 20286-2	ISO system of limits and fits - Part 2: Tables of standard tolerance grades and limit deviations for holes and shafts (ISO 286-2:1988)
ISO 235	Parallel shank jobber and stub series drills and Morse taper shank drills

3 GENERAL REQUIREMENTS

3.1 The ultrasonic inspection covered by this part of EN 10246 is usually carried out on tubes after completion of all the primary production process operations.

For cold-expanded tubes, the ultrasonic testing shall be carried out after expansion.

3.2 The tubes to be tested shall be sufficiently straight and free from foreign matter as to ensure the validity of the test.

4 METHOD OF TEST

4.1 The weld of the longitudinally or helically tubes shall be tested using an ultrasonic technique for the detection of imperfections oriented predominantly parallel and/or at right angles to the weld seam.

In both cases, testing shall be carried out in two opposite directions of beam travel, unless otherwise agreed between purchaser and manufacturer.

4.2 During testing, the transducer assembly shall be maintained in proper alignment with the weld so that the whole of the weld seam is scanned.

4.3 The ultrasonic test frequency to be applied shall be in the range of 2 MHz to 10 MHz dependent upon the thickness and surface finish of the tube to be tested.

4.4 The maximum width of each individual transducer, measured parallel to the major axis of the tube, shall be 25 mm.

4.5 The equipment shall be capable of classifying tubes as either acceptable or suspect by means of an automatic trigger/alarm level combined with a marking and/or sorting system.

4.6 When the weld seam at the tube ends cannot be tested by automatic ultrasonic equipment, the manufacturer shall otherwise test the weld seam ends. The test method shall, at the manufacturer's discretion be either a manual ultrasonic test in accordance with this part of EN 10246 or a radiographic test in accordance with prEN 10246-10:1999.

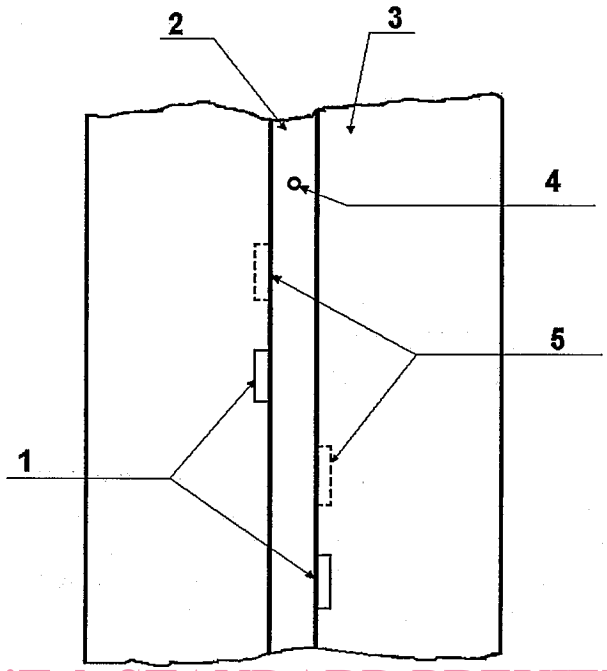
5 REFERENCE STANDARDS

5.1 General

5.1.1 The reference standards defined in this part of EN 10246 are convenient standards for establishing the sensitivity of non-destructive testing equipment. The dimensions of these standards should not be construed as the minimum size of imperfections detectable by such equipment.

5.1.2 The ultrasonic equipment for the detection of longitudinal imperfections shall be calibrated using four longitudinal notches, two on the outside surface and two on the inside surface of a tubular test piece, and/or a reference hole (see figure 1). Transducers for the detection of transverse imperfections shall be calibrated using the hole and/or two notches transverse to the weld, one on the outside and one on the inside of the test piece.

The selection of notches or hole is at the discretion of the manufacturer.



1 = longitudinal internal notches
2 = submerged arc weld seam
3 = tubular test piece or section of tube
4 = through hole
5 = longitudinal external notches

Figure 1 - Arrangement of reference notches and reference hole

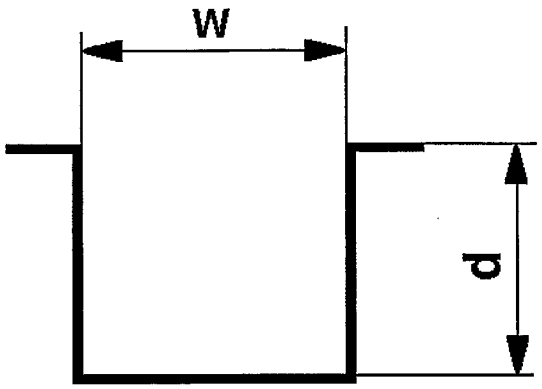
5.1.3 The test piece shall have the same specified diameter, thickness, surface finish and heat treated condition as the tube to be tested and shall have similar acoustic properties (for example, velocity, attenuation coefficient).

The manufacturer shall have the option of removing the weld bead, inside and outside, so that it is in alignment with the curvature of the tube body.

5.1.4 The external and internal notches and the reference hole shall be sufficiently separated from the ends of the test piece and from each other so that clearly distinguishable signal indications are obtained.

5.2 Reference notches

5.2.1 The reference notches shall be of the 'N' type (see figure 2). The sides shall be nominally parallel and the bottom shall be nominally square to the sides.



w = width *d* = depth

Figure 2 – 'N'-type notch

5.2.2 The longitudinal reference notches shall be located in the parent material close to the weld edges and shall lie parallel to the weld seam (see figure 1).

5.2.3 The reference notch shall be formed by machining, spark erosion or other methods.

NOTE: It is recognized that the bottom or the bottom corners of the notch may be rounded.

5.2.4 The dimensions of the reference notches shall be as follows:

a) the width *w* (see figure 2) of the reference notch shall not be greater than 1,5 mm;

b) the depth *d* (see figure 2) shall be as shown in table 1, with the following limitations:

- minimum notch depth: 0,3 mm for U2 and U3 category tubes and 0,5 mm for U4 category tubes;
- maximum notch depth: 2,0 mm for U2 and U3 category tubes and 3 mm for U4 category tubes;

c) the tolerance on depth shall be ±15 % of reference notch depth or ±0,05 mm, whichever is the larger;

d) the length of the reference notches shall be at least twice the width of each individual transducer, with a maximum of 50 mm.

5.2.5 The reference notch dimensions and shape shall be verified by a suitable technique.