

# ILNAS

Institut luxembourgeois de la normalisation  
de l'accréditation, de la sécurité et qualité  
des produits et services

## ILNAS-EN 10217-1:2019

### **Welded steel tubes for pressure purposes - Technical delivery conditions - Part 1: Electric welded and submerged arc welded non-alloy steel**

Geschweißte Stahlrohre für  
Druckbeanspruchungen - Technische  
Lieferbedingungen - Teil 1: Elektrisch  
geschweißte und

Tubes soudés en acier pour service sous  
pression - Conditions techniques de  
livraison - Partie 1 : Tubes en acier non  
allié, soudés électriquement et soudés à

## National Foreword

This European Standard EN 10217-1:2019 was adopted as Luxembourgish Standard ILNAS-EN 10217-1:2019.

Every interested party, which is member of an organization based in Luxembourg, can participate for FREE in the development of Luxembourgish (ILNAS), European (CEN, CENELEC) and International (ISO, IEC) standards:

- Participate in the design of standards
- Foresee future developments
- Participate in technical committee meetings

<https://portail-qualite.public.lu/fr/normes-normalisation/participer-normalisation.html>

### THIS PUBLICATION IS COPYRIGHT PROTECTED

Nothing from this publication may be reproduced or utilized in any form or by any mean - electronic, mechanical, photocopying or any other data carries without prior permission!

ILNAS-EN 10217-1:2019  
EUROPEAN STANDARD **EN 10217-1**  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

April 2019

ICS 23.040.10; 77.140.75

Supersedes EN 10217-1:2002

English Version

**Welded steel tubes for pressure purposes - Technical  
delivery conditions - Part 1: Electric welded and  
submerged arc welded non-alloy steel tubes with specified  
room temperature properties**

Tubes soudés en acier pour service sous pression -  
Conditions techniques de livraison - Partie 1 : Tubes en  
acier non allié, soudés électriquement et soudés à l'arc  
immergé, avec caractéristiques spécifiées à  
température ambiante

Geschweißte Stahlrohre für Druckbeanspruchungen -  
Technische Lieferbedingungen - Teil 1: Elektrisch  
geschweißte und unterpulvergeschweißte Rohre aus  
unlegierten Stählen mit festgelegten Eigenschaften bei  
Raumtemperatur

This European Standard was approved by CEN on 25 February 2019.

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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

**Contents**

	Page
<b>European foreword.....</b>	<b>5</b>
<b>1 Scope .....</b>	<b>6</b>
<b>2 Normative references .....</b>	<b>6</b>
<b>3 Terms and definitions .....</b>	<b>7</b>
<b>4 Symbols .....</b>	<b>8</b>
<b>5 Classification and designation.....</b>	<b>8</b>
<b>5.1 Classification.....</b>	<b>8</b>
<b>5.2 Designation.....</b>	<b>8</b>
<b>6 Information to be supplied by the purchaser .....</b>	<b>9</b>
<b>6.1 Mandatory information.....</b>	<b>9</b>
<b>6.2 Options .....</b>	<b>9</b>
<b>6.3 Example of an order .....</b>	<b>10</b>
<b>7 Manufacturing process.....</b>	<b>10</b>
<b>7.1 Steelmaking process .....</b>	<b>10</b>
<b>7.2 Tube manufacture and delivery conditions .....</b>	<b>10</b>
<b>7.3 Non Destructive Testing Personnel Requirements.....</b>	<b>12</b>
<b>8 Requirements .....</b>	<b>12</b>
<b>8.1 General.....</b>	<b>12</b>
<b>8.2 Chemical composition .....</b>	<b>12</b>
<b>8.2.1 Cast analysis.....</b>	<b>12</b>
<b>8.2.2 Product analysis .....</b>	<b>14</b>
<b>8.3 Mechanical properties.....</b>	<b>14</b>
<b>8.4 Appearance and internal soundness.....</b>	<b>15</b>
<b>8.4.1 Weld seam.....</b>	<b>15</b>
<b>8.4.2 Tube surface.....</b>	<b>16</b>
<b>8.4.3 Internal soundness.....</b>	<b>16</b>
<b>8.5 Straightness.....</b>	<b>16</b>
<b>8.6 Preparation of ends .....</b>	<b>16</b>
<b>8.7 Dimensions, masses and tolerances.....</b>	<b>17</b>
<b>8.7.1 Diameter and wall thickness.....</b>	<b>17</b>
<b>8.7.2 Mass.....</b>	<b>17</b>
<b>8.7.3 Lengths.....</b>	<b>17</b>
<b>8.7.4 Tolerances .....</b>	<b>22</b>
<b>9 Inspection.....</b>	<b>24</b>
<b>9.1 Types of Inspection and inspection documents .....</b>	<b>24</b>
<b>9.2 Content of inspection documents .....</b>	<b>25</b>
<b>9.3 Summary of inspection and testing .....</b>	<b>26</b>
<b>10 Sampling .....</b>	<b>28</b>
<b>10.1 Frequency of tests .....</b>	<b>28</b>
<b>10.1.1 Test unit.....</b>	<b>28</b>
<b>10.1.2 Number of sample tubes per test unit .....</b>	<b>28</b>
<b>10.2 Preparation of samples and test pieces .....</b>	<b>28</b>
<b>10.2.1 Selection and preparation of samples for product analysis .....</b>	<b>28</b>
<b>10.2.2 Location, orientation and preparation of samples and test pieces for mechanical tests .....</b>	<b>28</b>
<b>11 Verification of test methods .....</b>	<b>30</b>
<b>11.1 Chemical analysis .....</b>	<b>30</b>
<b>11.2 Tensile test on the tube body .....</b>	<b>30</b>

11.3	Transverse tensile test on the weld.....	30
11.4	Flattening test.....	30
11.5	Drift expanding test.....	31
11.6	Weld bend test.....	31
11.7	Impact test .....	31
11.8	Leak tightness test .....	32
11.8.1	Hydrostatic test.....	32
11.8.2	Electromagnetic test.....	33
11.9	Dimensional inspection .....	33
11.10	Visual examination .....	33
11.11	Non-Destructive Testing.....	33
11.11.1	General.....	33
11.11.2	EW and HFW tubes .....	33
11.11.3	SAW tubes .....	33
11.11.4	Strip end welds in SAWH tubes .....	34
11.12	Retest, sorting and reprocessing.....	34
12	Marking.....	34
12.1	Marking to be applied.....	34
12.2	Additional marking.....	35
13	Protection.....	35
<b>Annex A (normative) Qualification of welding procedure for quality TR2 SAW tube production .....</b>		36
A.1	General.....	36
A.2	Welding procedure specification .....	36
A.2.1	General.....	36
A.2.2	Parent metal.....	36
A.2.3	Weld preparation .....	36
A.2.4	Filler wires and fluxes .....	36
A.2.5	Electrical parameters .....	37
A.2.6	Mechanical parameters.....	37
A.2.7	Heat input (kJ/mm) .....	37
A.2.8	Preheat temperature .....	37
A.2.9	Interpass temperature .....	37
A.2.10	Postweld heat treatment .....	37
A.2.11	Example of welding procedure specification form .....	37
A.3	Preparation of sample tube and sample assessment.....	38
A.3.1	Sample tube .....	38
A.3.2	Sample assessment.....	38
A.4	Inspection and testing of the weld .....	38
A.5	Weld test pieces .....	39
A.5.1	Weld bend test pieces .....	39
A.5.2	Macro-examination .....	39
A.5.3	Transverse weld tensile test .....	39
A.5.4	Weld impact test .....	39
A.6	Test methods.....	39

A.6.1	Visual examination .....	39
A.6.2	NDT test .....	39
A.6.3	Weld bend test.....	39
A.6.4	Macro-examination .....	39
A.6.5	Transverse weld tensile test .....	40
A.6.6	Weld impact test.....	40
A.7	Test acceptance levels .....	40
A.7.1	Visual examination .....	40
A.7.2	NDT test .....	40
A.7.3	Weld bend test.....	40
A.7.4	Macro-examination .....	40
A.7.5	Transverse weld tensile test .....	40
A.7.6	Weld impact test.....	40
A.7.7	Example of test result document .....	40
A.8	Range of use of qualified procedures.....	42
A.8.1	Materials groups.....	42
A.8.2	Materials thickness.....	42
A.8.3	Filler wire classification .....	42
A.8.4	Welding flux .....	42
A.8.5	Other parameters.....	42
A.9	Qualification record .....	42
	<b>Annex B (informative) Technical changes from the previous edition .....</b>	<b>43</b>
B.1	Introduction .....	43
B.2	Technical changes .....	43
	<b>Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of 2014/68/EU .....</b>	<b>45</b>
	<b>Bibliography .....</b>	<b>46</b>

## European foreword

This document (EN 10217-1:2019) has been prepared by Technical Committee CEN/TC 459 "ECISS - European Committee for Iron and Steel Standardization"<sup>1</sup>, 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 October 2019, and conflicting national standards shall be withdrawn at the latest by October 2019.

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

This document supersedes EN 10217-1:2002.

This document 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 2014/68/EU.

For relationship with EU Directive 2014/68/EU (formerly 97/23/EC), see informative Annex ZA, which is an integral part of this document.

This European Standard consists of the following parts, under the general title *Welded steel tubes for pressure purposes – Technical delivery conditions*:

- Part 1: Electric welded and submerged arc welded non-alloy steel tubes with specified room temperature properties;
- Part 2: Electric welded non-alloy and alloy steel tubes with specified elevated temperature properties;
- Part 3: Electric welded and submerged arc welded alloy fine grain steel tubes with specified room, elevated and low temperature properties;
- Part 4: Electric welded non-alloy steel tubes with specified low temperature properties;
- Part 5: Submerged arc welded non-alloy and alloy steel tubes with specified elevated temperature properties;
- Part 6: Submerged arc welded non-alloy steel tubes with specified low temperature properties;
- Part 7: Stainless steel tubes.

Another European Standard series covering tubes for pressure purposes is:

EN 10216, *Seamless steel tubes for pressure purposes*.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

---

<sup>1</sup> Through its subcommittee SC 10 "Steel tubes, and iron and steel fittings" (secretariat: UNI)

## 1 Scope

This document specifies the technical delivery conditions for qualities TR1 and TR2 of electric welded and submerged arc welded tubes of circular cross section, with specified room temperature properties, made from non-alloy quality steel.

NOTE 1 Quality TR2 is intended to support the essential requirements of EU Directive 2014/68/EU in respect of pressure equipment with specified room temperature properties (see Table 5).

NOTE 2 Once this standard is published in the Official Journal of the European Union (OJEU), presumption of conformity to the Essential Safety Requirements (ESR) of Directive 2014/68/EU is limited to the technical data for the materials in this standard and does not presume adequacy of the material for a specific item of pressure equipment. Consequently, the assessment of the technical data stated in this material standard against the design requirements of a specific item of equipment to verify that the ESRs of the Pressure Equipment Directive are satisfied, needs to be done by the designer or manufacturer of the pressure equipment, taking also into account any subsequent processing procedures which may affect properties of the base materials.

## 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.

EN 10020, *Definition and classification of grades of steel*

EN 10021:2006, *General technical delivery conditions for steel products*

EN 10027-1, *Designation systems for steels — Part 1: Steel names*

EN 10027-2, *Designation systems for steels — Part 2: Numerical system*

EN 10168:2004, *Steel products — Inspection documents — List of information and description*

EN 10204:2004, *Metallic products — Types of inspection documents*

EN 10220, *Seamless and welded steel tubes — Dimensions and masses per unit length*

CEN/TR 10261, *Iron and steel — European standards for the determination of chemical composition*

EN 10266, *Steel tubes, fittings and structural hollow sections — Symbols and definitions of terms for use in product standards*

EN ISO 148-1:2016, *Metallic materials — Charpy pendulum impact test — Part 1: Test method (ISO 148-1:2016)*

EN ISO 377:2017, *Steel and steel products — Location and preparation of samples and test pieces for mechanical testing (ISO 377:2017)*

EN ISO 2566-1:1999, *Steel — Conversion of elongation values — Part 1: Carbon and low alloy steels (ISO 2566-1:1984)*

EN ISO 4885, *Ferrous materials — Heat treatments — Vocabulary (ISO 4885)*

EN ISO 5173:2010, *Destructive tests on welds in metallic materials — Bend tests (ISO 5173:2009)*

EN ISO 6892-1:2016, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature (ISO 6892-1:2016)*

EN ISO 8492:2013, *Metallic materials — Tube — Flattening test (ISO 8492:2013)*