SLOVENSKI STANDARD
SIST EN 10222-3:2017

01-junij-2017

Nadomešča:
SIST EN 10222-3:2000

Jekleni izkovki za tlačne posode - 3. del: Nikljeva jekla s specificiranimi lastnostmi pri nizkih temperaturah

Steel forgings for pressure purposes - Part 3: Nickel steels with specified low temperature properties

Schmiedestücke aus Stahl für Druckbehälter - Teil 3: Nickelstähle mit festgelegten Eigenschaften bei tiefen Temperaturen

Pièces forgées en acier pour appareils à pression - Partie 3: Aciers au nickel avec caractéristiques spécifiées à basse température

Ta slovenski standard je istoveten z: **EN 10222-3:2017**

ICS:

77.140.30	Jekla za uporabo pod tlakom	Steels for pressure purposes
77.140.85	Železni in jekleni kovani izdelki	Iron and steel forgings

SIST EN 10222-3:2017 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 10222-3

April 2017

ICS 77.140.30; 77.140.85

Supersedes EN 10222-3:1998

English Version

Steel forgings for pressure purposes - Part 3: Nickel steels with specified low temperature properties

Pièces forgées en acier pour appareils à pression - Partie 3: Aciers au nickel avec caractéristiques spécifiées à basse température

Schmiedestücke aus Stahl für Druckbehälter - Teil 3: Nickelstähle mit festgelegten Eigenschaften bei tiefen Temperaturen

This European Standard was approved by CEN on 25 December 2016.

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.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 10222-3:2017) has been prepared by Technical Committee ECISS/TC 111 “Steel castings and forgings”, 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 2017, and conflicting national standards shall be withdrawn at the latest by October 2017.

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 10222-3:1998.

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, see informative Annex ZA, which is an integral part of this document.

EN 10222 consists of the following parts under the general title “Steel forgings for pressure purposes”:

— *Part 1: General requirements*

— *Part 2: Ferritic and martensitic steels with specified elevated temperature properties*

— *Part 3: Nickel steels with specified low temperature properties*

— *Part 4: Weldable fine grain steels with high proof strength*

— *Part 5: Martensitic, austenitic and austenitic-ferritic stainless steels.*

Annex A provides details about significant technical changes to EN 10222-3:1998.

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.

1 Scope

This European Standard specifies the technical delivery conditions of forgings for pressure purposes, made of nickel steels, for use at low temperatures.

NOTE Once this standard is published in the EU Official Journal (OJEU) under Directive 2014/68/EU, presumption of conformity to the Essential Safety Requirements (ESRs) of Directive 2014/68/EU is limited to technical data of materials in this standard and does not presume adequacy of the material to a specific item of equipment. Consequently, the assessment of the technical data stated in this material standard against the design requirements of this specific item of equipment to verify that the ESRs of Directive 2014/68/EU are satisfied, needs to be done. The series EN 10222–1 to EN 10222–5 is structured so that the data related to different materials is in the part allocated for that material. The presumption of conformity to the Essential Safety Requirements of Directive 2014/68/EU depends on both the text in part 1 and the data in part 2, 3, 4 or 5.

General information on technical delivery conditions is given in EN 10021.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 10222-1:2017, *Steel forgings for pressure purposes — Part 1: General requirements*

3 Terms and definitions

For the purpose of this document, the terms and definitions given in EN 10222-1:2017 apply.

4 Classification and designation

4.1 Classification

In accordance with EN 10020, the grades of this standard are alloy special steels.

4.2 Designation

See EN 10222-1:2017.

5 Information to be supplied by the purchaser

5.1 Mandatory information

See EN 10222-1:2017.

5.2 Options

A number of options are specified in this European Standard and listed below. Additionally the relevant options of EN 10222-1:2017 apply. If the purchaser does not give any information to implement any of these options at the time of enquiry and order, the products shall be supplied in accordance with the basic specification (see also EN 10222-1:2017).

1) different nickel content according to steel grades (see Table 2, footnotes b) and c);

2) minimum impact energy values (see Table 5);

3) test to evaluate the resistance to hydrogen induced cracking (see 6.7).

6 Requirements

6.1 Steelmaking process and manufacture of the product

Shall be in accordance with EN 10222-1:2017.

6.2 Delivery condition

The products shall be delivered in the heat treatment condition specified in Table 1.

6.3 Chemical composition and chemical composition properties

6.3.1 Cast analysis

The chemical composition (cast analysis), determined in accordance with EN 10222-1:2017 shall conform to the requirements of Table 2.

6.3.2 Product analysis

The product analysis shall not deviate from the specific cast analysis (see 6.3.1) by more than the values specified in Table 3.

6.4 Mechanical properties

When heat treated in accordance with Table 1, the mechanical properties at room temperature determined in accordance with EN 10222-1:2017 shall conform to the requirements of Table 4.

The temperature for testing the impact properties shall be agreed at the time of enquiry and order. The minimum impact properties shall fulfil the requirements of Table 5.

6.5 Surface condition

See EN 10222-1:2017.

6.6 Internal soundness

See EN 10222-1:2017.

6.7 Resistance to hydrogen induced cracking

Non-alloy and low alloy steels may be susceptible to cracking when exposed to corrosive H_2S containing environments, usually referred to as „sour service“.

A test to evaluate the resistance to hydrogen induced cracking in accordance with EN 10229 may be agreed at the time of enquiry and order.

7 Inspection

See EN 10222-1:2017.

8 Sampling

See EN 10222-1:2017.

9 Test methods

See EN 10222-1:2017

10 Retests

See EN 10222-1:2017

11 Marking

See EN 10222-1:2017

Table 1 — Heat treatment

Steel designation		Heat treatment				
Name	Number	Symbol[b]	Austenizing or solution annealing		Tempering	
			Temperature °C	Cooling in[a]	Temperature °C	Cooling in[a]
13MnNi6–3	1.6217	+N (+NT)	880 to 940	a	580 to 640	a
15NiMn6	1.6228	+N	850 to 900	a	–	–
		+NT		a	600 to 660	a, w
		+QT		w, o	600 to 660	a, w
12Ni14	1.5637	+N	830 to 880	a	–	–
		+NT			580 to 640	a, w
		+QT	820 to 870	w, o		
X12Ni5	1.5680	+N	800 to 850	a	–	–
		+NT			580 to 660	a, w
		+QT		w, o		
X8Ni9 + NT640	1.5662 +NT640	+N+NT	880 to 930 + 770 to 830	a	540 to 600	a, w
X8Ni9 + QT640	1.5662 +QT640	+QT	770 to 830	w, o	540 to 600	a, w
X8Ni9 + QT680	1.5662 +QT680	+QT	770 to 830	w, o	540 to 600	a, w

a a = air; o = oil; w = water or water based medium.

b *N* = normalized; NT = normalized and tempered; QT = quenched and tempered; NT640/QT640/QT680: Heat treatment variant with minimum tensile strength of 640 MPa or 680 MPa.