SLOVENSKI STANDARD
SIST EN 10349:2010

01-januar-2010

Jekleni ulitki - Ulitki iz avstenitnega manganovega jekla

Steel castings - Austenitic manganese steel castings

Stahlguss - Austenitischer Manganstahlguss

Aciers moulés - Pièces moulées en acier austénitique au manganèse

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Ta slovenski standard je istoveten z: **EN 10349:2009**

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ICS:

77.140.80	Železni in jekleni ulitki	Iron and steel castings

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

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English Version

Steel castings - Austenitic manganese steel castings

Aciers moulés - Pièces moulées en acier austénitique au manganèse

Stahlguss - Austenitischer Manganstahlguss

This European Standard was approved by CEN on 15 September 2009.

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SIST EN 10349:2010

Contents

Page

Foreword 3
1 Scope 4
2 Normative references 4
3 ■ Terms and definitions 4
4 ■ Information to be supplied by the purchaser 4
5 ■ Designation 5
6 ■ Manufacture 5
7 ■ Requirements 5
8 Testing and documents on material testing 6
9 ■ Marking 7
10 ■ Packaging and surface protection 7
11 ■ Complaints 7
12 Supplementary information 7

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SIST EN 10349:2010
https://ecommerce.sist.si/catalog/standards/sist/dd9f0709-53bb-4271-bed5-0c91aa979f90/sist-en-10349-2010

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Foreword

This document (EN 10349:2009) has been prepared by Technical Committee ECISS/TC 31 “Steel castings”, 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of an identical text or by endorsement, at the latest by April 2010, and conflicting national standards shall be withdrawn at the latest by April 2010.

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

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

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1 Scope

This European Standard specifies austenitic manganese cast steels for wear-resistant service. The grades covered by this European Standard will experience maximum service life in applications where the surface of the casting is subject to impact.

This European Standard retains the same format for clauses as EN 1559-1 and EN 1559-2. It shall be used in conjunction with these standards. Where no text is given under a clause heading, the corresponding clause of EN 1559-1 or EN 1559-2 applies.

The structure of this standard is as follows:

a) clauses and subclauses preceded by ■ indicates no additional conditions to Part 1 or Part 2 [1)] of EN 1559;

b) subclauses without any marking are mandatory.

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.

EN 1559-1, *Founding — Technical conditions of delivery — Part 1: General*

EN 1559-2, *Founding — Technical conditions of delivery — Part 2: Additional requirements for steel castings*

EN ISO 6506-1, *Metallic materials — Brinell hardness test — Part 1: Test method (ISO 6506-1:2005)*

EN ISO 7438, *Metallic materials — Bend test (ISO 7438:2005)*

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SIST EN 10349:2010
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3 ■ Terms and definitions

4 ■ Information to be supplied by the purchaser

In addition to EN 1559-1 and EN 1559-2:

Materials furnished according to this European Standard shall conform to the applicable requirements of EN 1559-1 and EN 1559-2 including the supplementary requirements that are agreed in the inquiry and purchase order.

1) When additional information is given in a clause or subclause of this standard (versus the same clause or subclause of EN 1559-1 or EN 1559-2) it is preceded by: "In addition to EN 1559:...".

SIST EN 10349:2010

5 ■ Designation

6 ■ Manufacture

6.1 ■ Manufacture process

6.1.1 ■ Melting

6.1.2 Heat treatment

In addition to EN 1559-1 and EN 1559-2:

Grade GX90MnMo14 may be supplied without heat treatment if the casting thickness is less than 45 mm and the carbon content is less than 0,8 %.

Where the thickness is 45 mm or greater and the carbon content is 0,8 % or greater Grade GX90MnMo14, and all other grades, shall be solution treated at temperatures not lower than 1 040 °C and quenched in water.

7 ■ Requirements

7.1 ■ General

7.2 ■ Material

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7.2.1 Chemical composition

In addition to EN 1559-1 and EN 1559-2:

The chemical composition determined by a cast analysis shall conform with the values given in Table 1.

7.2.2 Mechanical properties

7.2.2.1 General

Mechanical testing at room temperature shall be performed when agreed upon between the purchaser and manufacturer.

7.2.2.2 Bend test

Bend tests shall be carried out in accordance with EN ISO 7438. The type and location of bend test pieces shall be agreed between the manufacturer and purchaser. The test specimen shall withstand bending at room temperature (23 ± 5) °C through an angle of 150° without breaking into two or more pieces. Surface cracks produced by bending are not considered as failure if the test piece remains in one piece.

7.2.2.3 Brinell Hardness test

Hardness tests shall be carried out in accordance with EN ISO 6506-1. The hardness shall be a maximum of 300 HBW, unless otherwise agreed between the manufacturer and purchaser. When machining of castings is required, it may be necessary to control hardness. In this case hardness testing shall be carried out after heat treatment and prior to machining.

SIST EN 10349:2010

7.2.3 Microstructure

Metallographic examination shall be performed when agreed upon between the manufacturer and purchaser. Standard microstructure charts may be agreed between the manufacturer and purchaser.

7.3 ■ Casting

8 Testing and documents on material testing

8.1 ■ General

8.2 Inspection and testing

8.2.1 ■ Types of inspection and testing

8.2.2 ■ Non specific inspection and testing

8.2.3 ■ Specific inspection and testing

8.2.4 ■ Continuous inspection

8.2.5 Place of specific inspection and testing

Inspections and tests shall be carried out at a place agreed upon between the manufacturer and purchaser.

Samples may be selected in the manufacturer's works. Depending on the type of test, samples may be blocks or castings representative of the product.

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8.2.6 Submission for specific inspection and testing to the inspection representative

8.2.6.1 General

The manufacturer shall arrange with the purchaser, by mutual agreement, the date of submission for inspection.

The inspection representative shall have free access at any suitable time to the places in which the products to be inspected are manufactured and stored. He may indicate the samples to be selected in accordance with the specification. He shall have the option of attending the selection of samples, the preparation (machining and treatment) of the test pieces and carrying out the tests. However, an inspection representative who visits the workshops shall respect all of the safety regulations in force in the works and shall be accompanied, as far as possible, by a representative of this works.

8.2.6.2 Conditions of acceptance

If all the requirements of the order, and of this European Standard, are fulfilled, the lot is considered to conform and is accepted by the purchaser without prejudice to the inspection which may take place later at the purchaser's works within the time limits specified by agreement between the manufacturer and purchaser.

SIST EN 10349:2010

8.3 ■ Test unit sampling

8.4 ■ Samples (test block)

8.5 Test methods

a) ■ tensile test at room temperature (not applicable);

b) tensile test at elevated temperature, verification by agreement at the time of enquiry and order (not applicable;

c) impact test (not applicable);

d) ■ ferrite content;

e) ■ hardness test;

f) ■ homogeneity of test unit (hardness test);

g) ■ pressure or leak testing;

h) intergranular corrosion test (not applicable);

i) ■ test for magnetic properties;

j) ■ other test for any other properties.

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8.6 ■ Invalidation of tests

8.7 ■ Retests

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8.8 ■ Sorting and reprocessing

9 ■ Marking

10 ■ Packaging and surface protection

11 ■ Complaints

12 Supplementary information

A list of standardized supplementary requirements for use at the discretion of the purchaser is included in EN 1559-1 and EN 1559-2. Those which are ordinarily considered suitable for use with this specification are given above. The details of these are listed in EN 1559-1 and EN 1559-2. Others, whether or not contained in EN 1559-1 and EN 1559-2, may be used with this European Standard upon agreement between the manufacturer and purchaser.

Table 1 — Chemical composition (cast analysis)

Designation		Chemical composition							
		% by mass							
		C	Si	Mn	P	S	Cr	Mo	Ni
Name	Number				max.	max.			
GX120MnMo7-1	1.3415	1,05 to 1,35	0,3 to 0,9	6 to 8	0,060	0,045	—	0,9 to 1,2	—
GX110MnMo13-1	1.3416	0,75 to 1,35	0,3 to 0,9	11 to 14	0,060	0,045	—	0,9 to 1,2	—
GX100Mn13[a]	1.3406	0,90 to 1,05	0,3 to 0,9	11 to 14	0,060	0,045	—	—	—
GX120Mn13[a]	1.3802	1,05 to 1,35	0,3 to 0,9	11 to 14	0,060	0,045	—	—	—
GX120MnCr13-2	1.3410	1,05 to 1,35	0,3 to 0,9	11 to 14	0,060	0,045	1,5 to 2,5	—	—
GX120MnNi13-3	1.3425	1,05 to 1,35	0,3 to 0,9	11 to 14	0,060	0,045	—	—	3 to 4
GX120Mn18[a]	1.3407	1,05 to 1,35	0,3 to 0,9	16 to 19	0,060	0,045	—	—	—
GX90MnMo14	1.3417	0,70 to 1,00	0,3 to 0,6	13 to 15	0,070	0,045		1,0 to 1,8	—
GX120MnCr18-2	1.3411	1,05 to 1,35	0,3 to 0,9	16 to 19	0,060	0,045	1,5 to 2,5	—	—

[a] These grades are sometimes used for non magnetic service

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