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Austenitic manganese steel castings

Pièces moulées en acier austénitique au manganèse

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 17, *Steel*, Subcommittee SC 11, *Steel castings*.

This third edition cancels and replaces the second edition (ISO 13521:2015), of which it constitutes a minor revision. The changes are as follows:

- editorial update;
- [Clause 5](#) update;
- [Clause 2](#) update.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Austenitic manganese steel castings

1 Scope

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

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.

ISO 4990, *Steel castings — General technical delivery requirements*

ISO 7438, *Metallic materials — Bend test*

ISO 6506 (all parts), *Metallic materials — Brinell hardness test*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

4 General conditions of delivery

Materials furnished according to this document shall conform to the applicable requirements of ISO 4990, including the supplementary requirements that are agreed in the inquiry and purchase order.

5 Heat treatment

Solution heat treat at temperatures not lower than 1 040 °C and quenched in water.

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 %.

6 Chemical composition

The steel shall conform to the requirements for chemical composition specified in [Table 1](#).

Table 1 — Chemical composition, in % by mass

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

^a These grades are sometimes used for non-magnetic service.

7 Mechanical tests

7.1 General

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

7.2 Bend test

Bend tests shall be carried out in accordance with 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 (18 °C to 28 °C) through 150 °C without breaking into two or more pieces. Surface cracks produced by bending are not considered as failure if the test specimen remains in one piece.

7.3 Hardness test

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

8 Microstructure

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

9 Supplementary requirements

A list of supplementary requirements for use at the discretion of the purchaser is included in ISO 4990.

Others, whether or not in ISO 4990, can be used with this specification upon agreement between the manufacturer and purchaser.

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Bibliography

- [1] EN 10349, *Steel castings — Austenitic manganese steel castings*

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