

INTERNATIONAL STANDARD

ISO 13521

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Austenitic manganese steel castings

Pièces moulées en acier austénitique au manganèse

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ISO 13521:1999

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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

International Standard ISO 13521 was prepared by Technical Committee ISO/TC 17, *Steel*, Subcommittee SC 11, *Steel castings*.

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Austenitic manganese steel castings

1 Scope

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

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 4990:1986, *Steel castings — General technical delivery conditions*.

ISO 7438:1985, *Metallic materials — Bend test*.

ISO 6506:1981¹⁾, *Metallic materials — Hardness test — Brinell test*.

3 General conditions of delivery

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

4 Heat treatment

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.

5 Chemical composition

The steel shall conform to the requirements for chemical composition specified in Table 1.

1) To be replaced by ISO 6506-1, ISO 6506-2 and ISO 6506-3.

Table 1 — Chemical composition

| Steel grades | Chemical composition % (m/m) | | | | | | | |
|------------------------|---------------------------------|-----|----|-----------|-----------|-----|-----|----|
| | C | Si | Mn | P max. | S max. | Cr | Mo | Ni |
| GX120MnMo7-1 | 1,05 | 0,3 | 6 | 0,060 | 0,045 | | 0,9 | |
| | 1,35 | 0,9 | 8 | | | | 1,2 | |
| GX110MnMo13-1 | 0,75 | 0,3 | 11 | 0,060 | 0,045 | | 0,9 | |
| | 1,35 | 0,9 | 14 | | | | 1,2 | |
| GX100Mn13 ^a | 0,90 | 0,3 | 11 | 0,060 | 0,045 | | | |
| | 1,05 | 0,9 | 14 | | | | | |
| GX120Mn13 ^a | 1,05 | 0,3 | 11 | 0,060 | 0,045 | | | |
| | 1,35 | 0,9 | 14 | | | | | |
| GX120MnCr13-2 | 1,05 | 0,3 | 11 | 0,060 | 0,045 | 1,5 | | |
| | 1,35 | 0,9 | 14 | | | 2,5 | | |
| GX120MnNi13-3 | 1,05 | 0,3 | 11 | 0,060 | 0,045 | | | 3 |
| | 1,35 | 0,9 | 14 | | | | | 4 |
| GX120Mn17 ^a | 1,05 | 0,3 | 16 | 0,060 | 0,045 | | | |
| | 1,35 | 0,9 | 19 | | | | | |
| GX90MnMo14 | 0,70 | 0,3 | 13 | 0,070 | 0,045 | | 1,0 | |
| | 1,00 | 0,6 | 15 | | | | 1,8 | |
| GX120MnCr17-2 | 1,05 | 0,3 | 16 | 0,060 | 0,045 | 1,5 | | |
| | 1,35 | 0,9 | 19 | | | 2,5 | | |

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

6 Bend test and/or hardness test

6.1 General

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

6.2 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° 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.

6.3 Hardness test

Hardness tests shall be carried out in accordance with ISO 6506. The hardness shall be a maximum of 300 HBS, 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.

7 Microstructure

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

8 Supplementary requirements

A list of standardized supplementary requirements for use at the discretion of the purchaser is included in ISO 4990:1986. Those which are ordinarily considered suitable for use with this specification are given below. The details of these are listed in ISO 4990:1986. Others, whether or not in ISO 4990:1986, may be used with this specification upon agreement between the manufacturer and purchaser.

— 9.1.2 Reporting of the steel making process

— 9.1.3 Agreed manufacturing procedure

— 9.1.4 Dividing up the cast

— 9.8.1 Prior agreement relating to major weld repairs

— 9.8.2 Weld maps

— 9.9.1 Liquid penetrant inspection

— 9.9.3 Radiographic examination

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