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**Ships and marine technology —  
Specification of high manganese  
austenitic steel thin strips used for  
LNG tanks on board ships**



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## Foreword

ISO (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. [www.iso.org/directives](http://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. [www.iso.org/patents](http://www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 8, *Ship design*.

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](http://www.iso.org/members.html).

## Introduction

There have been several requirements regarding metallic materials for cryogenic applications since the adoption of the IGC and IGF Codes. Recently, a new high manganese austenitic steel has been proposed for thick plates and piping systems of LNG carriers and LNG-fuelled ships<sup>[2]</sup>. However, only plates with a thickness ranging from 6 mm to 30 mm are specified and the target tank capacity is limited to 30 000 m<sup>3</sup>.

This document covers a newly developed high manganese austenitic steel for thin strip application. This steel has mechanical properties comparable or even higher than those of materials for cryogenic service listed in both the IGC Code<sup>[3]</sup> and IGF Code<sup>[4]</sup>, with good weldability and good resistance to atmospheric corrosion. Consequently, this high manganese austenitic steel is intended to satisfy the strength requirements of the structure of cargo tanks and fuel tanks of LNG carriers and LNG-fuelled ships.

This document provides a standard specification of high manganese austenitic steel for thin strip applications for material suppliers, ship owners, ship yards, manufacturers and shipping companies with regard to producing, purchasing, and using such materials.



# Ships and marine technology — Specification of high manganese austenitic steel thin strips used for LNG tanks on board ships

## 1 Scope

This document describes the specification of high manganese (Mn) austenitic steel thin strips with good weldability and good resistance to atmospheric corrosion intended to be used for LNG tanks on board ships.

It covers strips with a thickness ranging from 0,3 mm to 6,0 mm.

## 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 7438, *Metallic materials — Bend test*

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

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

IACS UR W1 rev 3 Aug 2016, *Material and welding for gas tankers*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

### 3.1

#### **high manganese austenitic steel**

#### **high Mn austenitic steel steel**

steel with high amount of Mn to retain austenite as its primary phase at atmospheric and service temperature

Note 1 to entry: Refer to [Table 1](#) in Clause [6.1](#).

### 3.2

#### **design temperature**

minimum temperature for the selection of materials at which cargo or fuel can be loaded or transported in the cargo or fuel tanks

Note 1 to entry: See References [\[2\]](#) and [\[3\]](#).