



**International  
Standard**

**ISO 18742**

**Ship and marine technology —  
High-manganese austenitic steel —  
Specification for high-manganese  
austenitic steel welded fittings for  
cryogenic temperature**

*Navires et technologie maritime — Acier austénitique à haute teneur en manganèse — Spécification pour les raccords soudés en acier austénitique à haute teneur en manganèse pour température cryogénique*

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## Foreword

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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 document 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](http://www.iso.org/directives)).

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This document was prepared by Technical Committee TC 8, *Ships and marine technology*, Subcommittee SC 4, *Outfitting and deck machinery*.

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

The aim of this document is to provide a set of common requirements for metallic materials used in cryogenic applications, in alignment with the IGC Code<sup>[1]</sup> and IGF Code<sup>[2]</sup> adopted by the International Maritime Organization (IMO).

The newly developed, high-manganese austenitic steel is expected to possess mechanical properties including Charpy impact energy values comparable to those materials for cryogenic service listed in both the IGC Code and IGF Code. Consequently, high-manganese steel is intended to satisfy the strength requirements of the structure of cargo tanks, fuel tanks and piping systems.

In addition, upon agreement with a purchaser, this document can be applied to piping systems for liquefied hydrogen.

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



# Ship and marine technology — High-manganese austenitic steel — Specification for high-manganese austenitic steel welded fittings for cryogenic temperature

## 1 Scope

This document provides requirements for wrought high-manganese austenitic steel welded fittings used for pressure piping at cryogenic temperature.

The specification of high-manganese austenitic steel welded fittings is applicable to all pressure retaining components and any non-pressure retaining components used in hull systems for marine technology and in onshore projects.

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

ISO 2566-1, *Steel — Conversion of elongation values — Part 1: Carbon and low-alloy steels*

ISO 2566-2, *Steel — Conversion of elongation values — Part 2: Austenitic steels*

ISO 3452-1, *Non-destructive testing — Penetrant testing — Part 1: General principles*

ISO 4136, *Destructive tests on welds in metallic materials — Transverse tensile test*

ISO 5173, *Destructive tests on welds in metallic materials — Bend tests*

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

ISO 9606-1, *Qualification testing of welders — Fusion welding — Part 1: Steels*

ISO 9712, *Non-destructive testing — Qualification and certification of NDT personnel*

ISO 10474, *Steel and steel products — Inspection documents*

ISO 15609-1, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 1: Arc welding*

ISO 15614-1, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 1: Arc and gas welding of steels and arc welding of nickel and nickel alloys*

ISO 18265, *Metallic materials — Conversion of hardness values*

ASME B16.28, *Wrought Steel Butt-Welding Short Radius Elbows and Returns*

ASME B16.9, *Factory-Made Wrought Buttwelding Fittings*

ASME B31.3, *Process Piping*

ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, 2023, *Rules for Construction of Pressure Vessels*

ASTM A960/960M, *Standard Specification for Common Requirements for Wrought Steel Piping Fittings*