



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 150.2-2024

Replacing GB/T 150.2-2011

Pressure vessels - Part 2: Materials

压力容器 第2部分：材料

Issued on: July 24, 2024

Implemented on: February 1, 2025

**Issued by: State Administration for Market Regulation;
National Standardization Administration..**

Table of Contents

Foreword

Introduction

1 Scope

2 Normative references

3 Terms and definitions

4 General requirements

5 Steel plates

6 Steel pipes

7 Steel forgings

8 Steel bars for studs (including bolts) and nuts

9 Welding materials

Appendix A (Normative) Supplementary provisions for steel

Appendix B Technical requirements that steel materials shall meet when included in this

Appendix C (Normative) Allowable stress

Appendix D (Normative) Requirements for the use of Q235 series steel plates

Appendix E High-temperature yield strength, high-temperature endurance strength limit

Appendix F Approximate comparison of high alloy steel designations

Foreword

This document was drafted in accordance with the provisions of GB/T 1.1-2020 "Directives for standardization - Part 1: Rules for the structure and drafting of standardizing documents".

This document is Part 2 of GB/T 150 "Pressure vessels". GB/T 150 has published the following parts:

- Part 4: Fabrication, inspection and testing, and acceptance.

This document replaces GB/T 150.2-2011 "Pressure vessels - Part 2: Materials".

Compared with GB/T 150.2-2011, in addition to structural adjustments and editorial changes, the main technical changes are as follows:

general requirements (see Chapter 4; Chapter 3 of the 2011 edition);

b) DELETE 1 low alloy steel plate (15MnNiDR) (see Table 2 and Table 4 of the c)

CHANGE the steel pipe standards and steel pipe use requirements (see Chapter 6, d) ADD 10 low alloy steel and alloy steel forgings (08Cr2AlMo, 09CrCuSb, 12CrMo, 15NiCuMoNb, 10Cr9Mo1VNbN, 10Cr9MoW2VNbBN, 30CrMo, 35CrNi3MoV, 36CrNi3MoV, 06Ni9D) (see Table 5, Table C.5, Table E.6); ADD 13 high alloy steel forgings (S11348, S23043, S25554, S25073, S30453, S30458, S31252, S31653, S31658, S32169, S34778, S34779, S51740) (see Table C.6, Table E.6, Table F.1);

e) ADD the welding materials (see Chapter 9);

f) ADD the technical requirements that steel shall meet to be included in this document (see Appendix B);

g) ADD the allowable stress of steel (see Appendix C).

This document was proposed by AND shall be under the jurisdiction of the National Technical Committee for Standardization of Boiler and Pressure Vessels (SAC/TC 262).

Please note that some contents of this document may involve patents. The issuing agency of this document does not assume the responsibility for identifying patents.

Drafting organizations of this document: Hefei General Machinery Research Institute Co., Ltd., China Special Equipment Testing and Research Institute, Sinopec Engineering Construction Co., Ltd., Sinopec Guangzhou Engineering Co., Ltd., Jiangsu Special Equipment Safety Supervision and Inspection Institute, Nanjing Iron and Steel Co., Ltd., Erzong (Deyang) Heavy Equipment Co., Ltd.

Main drafters of this document: Zhang Xiaohu, Yang Guoyi, Duan Rui, Zhang Guoxin, Chang Yanyan, Miao Chunsheng, Chen Tao, Chen Zhiwei, Lu Daiding, Hong Jun, and Shen Guoqu.

The previous versions of this document and the documents it replaces are as follows:

- It was first published in 1989 as GB 150-1989; it was revised for the first time in
- It was second revised in 2011 and published in parts; this document corresponds to
- This is the third revision.

Introduction

Pressure vessels are one of the special equipment involving public safety, which are important equipment in the fields of petrochemicals, energy equipment, biomedicine, etc. In order to improve the economy and safety of pressure vessels, China issued the "Design regulations for steel chemical vessels" in 1967, GB 150 "Steel pressure vessels" in 1989; GB 150 was revised in 1998, as a supporting standard for pressure vessel regulations, which regulates the construction requirements of steel pressure vessels. The GB/T 150 series of standards has been issued and implemented for more than ten years since 2011. During this period, the "Regulations on safety technical supervision of stationary pressure vessels" was revised in 2016; the materials, components, non-destructive testing standards cited were also revised. In view of this, it is necessary to revise and improve GB/T 150, to continuously adapt to the new demands of economic development for this standard and better promote the highquality development of pressure vessel products.

This document is one of the general technical standards for pressure vessel construction methods, which is used to regulate the relevant technical requirements for the design, manufacture, inspection and acceptance of pressure vessels built or used in China. GB/T 150 "Pressure vessels" consists of four parts.

- Part 1: General requirements. The purpose is to give the basic requirements for the fabrication of pressure vessels.
- Part 2: Materials. The purpose is to provide the basic requirements for the selection of pressure vessels and the material data used in the design and fabrication process.
- Part 3: Design. The purpose is to provide the design method and design technical requirements of pressure vessels.
- Part 4: Fabrication, inspection and testing, and acceptance. The purpose is to provide the requirements in the fabrication process of pressure vessels and the inspection and acceptance requirements.

The technical provisions of this document include the technical requirements to be followed in the pressure vessel construction process (i.e., design, fabrication, inspection and acceptance). This document does not need to, nor can it, cover all the technical details of the pressure vessel construction within the applicable scope.

This document does not restrict the use of advanced technical methods in actual

engineering design and construction; however, engineering and technical personnel must be able to make reliable judgments when using advanced technical methods, to ensure that they meet the provisions of this document, especially the design provisions such as strength or stability design formulas. This document neither requires nor restricts designers from using computer programs to analyze or design pressure vessels.

The committee shall not bear any responsibility for any ambiguity in understanding and any consequences arising from the dissemination or interpretation of the standard by other organizations, that have not been authorized or recognized in writing by the committee.

1 Scope

This document specifies the designations and standards of steel materials allowed for pressure components of steel pressure vessels, additional technical requirements for steel materials, the use range of steel materials (temperature and pressure), the allowable stress of steel materials, the basic requirements for welding materials.

This document is applicable to pressure vessels, which have a design temperature of $-269^{\circ}\text{C} \sim 800^{\circ}\text{C}$ and a design pressure not exceeding 35 MPa.

This document does not apply to the inapplicable scope specified in GB/T 150.1.

2 Normative references

The contents of the following documents constitute essential clauses of this document through normative references in the text. Among them, for referenced documents with dates, only the versions corresponding to the dates apply to this document; for referenced documents without dates, the latest versions (including all amendments) apply to this document. GB/T 6803 Test method for drop-weight test to determine nil-ductility transition temperature of ferritic steels GB/T 7735-2016 Automated eddy current testing of seamless and welded (except submerged arc-welded) steel tubes for detection of imperfections GB/T 9948 Seamless steel tubes for petroleum cracking GB/T 13305 Method for determining content of the α -phase in stainless steels GB/T 20878 Stainless steels - Designation and chemical composition GB/T 21433 Detecting susceptibility to intergranular corrosion in stainless steel pressure vessels GB/T 31935 Corrosion of metals and alloys - Corrosion test for intergranular corrosion susceptibility of low-Cr ferritic stainless steels GB/T 32571 Corrosion of metals and alloys - Corrosion test for intergranular corrosion susceptibility of high-Cr ferritic stainless steels GB/T 39255 Shielding gas for welding and cutting JB/T 4756 Nickel and nickel alloy pressure vessels NB/T 47002.1 Clad plate for pressure vessel - Part 1: Stainless steel-steel clad plate NB/T 47002.2 Clad plate for pressure vessel - Part 2: Nickel-steel clad plate NB/T 47002.3 Clad plate for pressure vessel - Part 3: Titanium-steel clad plate NB/T 47002.4 Clad plate for pressure vessel - Part 4: Copper-steel clad plate