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

GB/T 44148.2-2024

**Steel forgings and rolled or forged bars for pressure equipment
- Part 2: Low-alloy and alloy (Mo, Cr and CrMo) steels with
specified elevated temperature properties**

(English Translation)

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document is Part 2 of GB/T 44148 "Steel forgings, rolled or forged steel bars for pressure equipment". GB/T 44148 has been published the following parts.

- Part 1: General requirements;
- Part 2: Low alloy and alloy (molybdenum, chromium and chromium-molybdenum) steels with specified high temperature properties;
- Part 3: Low temperature toughness nickel steels.

This document is modified from ISO 9327-2:1999 "Technical delivery conditions for steel forgings, rolled or forged bars for pressure purposes - Part 2: Specifications" Non-alloy steels and alloy (molybdenum, chromium and chromium-molybdenum) steels with specified high temperature properties.

Compared with ISO 9327-2:1999, this document has many structural adjustments. A comparison of the structural number changes between the two documents See Appendix A for the table.

This document has many technical differences compared to ISO 9327-2:1999. The outer margins of the clauses involved are marked with vertical A list of these technical differences and their reasons is given in Appendix B.

For ease of use, the following editorial changes have been made to this document.

- Deleted the reference in ISO 9327-2:1999.

Introduction

Pressure equipment usually includes boilers, pressure vessels and pressure pipes. Such equipment is widely used in various aspects of the national economy. Their common

characteristics are it involves production and life safety. Once an accident occurs, the harm is great. There are many kinds of materials for manufacturing pressure equipment. Steel is the most important material in actual engineering.

The most widely used material. Steel for pressure equipment is a key raw material for the manufacture of major technical equipment and is the basis for the safe operation of pressure equipment.

As pressure equipment develops towards large-scale, high-parameter, and structural diversity, its working conditions are becoming more and more demanding.

This puts forward more stringent requirements on the materials used to manufacture pressure-bearing equipment. Reasonable selection of materials is crucial to the reasonable structure, safety and long-term operation of the equipment.

It is very important to operate and reduce costs.

GB/T 44148 "Steel forgings, rolled or forged steel bars for pressure equipment" aims to standardize the technical requirements of steel for pressure equipment.

Partial composition.

--- Part 1: General requirements. The purpose is to specify requirements common to other parts so that they can be referenced in other parts.

--- Part 2: Low alloy and alloy (molybdenum, chromium and chromium-molybdenum) steels with specified high temperature properties. The purpose is to specify the requirements for a certain temperature above room temperature.

Technical requirements for steel for pressure equipment (effective section thickness not exceeding 500mm) used under high temperatures.

--- Part 3: Low temperature toughness nickel steel. The purpose is to specify low temperature toughness nickel steel with a nominal diameter not greater than 50 mm for use in the manufacture of pressure equipment Technical requirements for ductile nickel steels.

--- Part 4: Fine-grained steel with higher yield strength. The purpose is to specify the use of steel with effective section thickness not greater than Technical requirements for 250mm fine grain steel.

--- Part 5: Stainless steel. The purpose is to specify stainless steel with an effective cross-sectional thickness not exceeding 500 mm used in the manufacture of pressure equipment Technical requirements for steel.

Steel forgings, rolled or forged steel bars for pressure equipment Part 2: Low alloys and alloys with specified elevated temperature properties (Molybdenum, Chromium and Chromium-Molybdenum) Steels

1 Scope

This document specifies the specifications for low alloy and alloy (molybdenum, chromium and chromium-molybdenum) steel forgings, rolled or forged steel bars having specified elevated temperature properties for use in pressure equipment.

Order content, size, shape, weight, technical requirements, test methods, inspection rules, packaging, marking and quality certificate.

This document applies to round steel and square steel (hereinafter referred to as steel bars) with an effective cross-sectional thickness not exceeding 500mm and single weight not exceeding 10t.

Forgings. Non-alloy steel and other alloy steels may be implemented by reference.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document.

GB/T 222 Permissible deviation of chemical composition of finished steel products GB/T 223.5 Determination of acid-soluble silicon and total silicon content of iron and steel - Reduced molybdenum silicate spectrophotometric method (GB/T 223.5-2008, ISO 4829-1:1986 GB/T 223.9 Determination of aluminum content in steel and alloys - Chrome azurol S spectrophotometric method GB/T 223.11 Determination of chromium content in steel and alloys by visual titration or potentiometric titration (GB/T 223.11-2008, ISO 4937:1986, MOD) GB/T 223.12 Methods for chemical analysis of iron, steel and alloys - Sodium carbonate separation-diphenylcarbazide photometric method for the determination of chromium content GB/T 223.13 Chemical analysis methods for iron, steel and alloys - Ammonium ferrous sulfate titration method for determination of vanadium content GB/T 223.14 Chemical analysis methods for iron, steel and alloys - Tantalum extraction spectrophotometric method for determination of vanadium content GB/T 223.23 Determination of nickel content in steel and alloys - Dimethylglyoxime spectrophotometric method GB/T 223.25 Methods for chemical analysis of iron, steel and alloys - Dimethylglyoxime gravimetric method for the determination of nickel content GB/T 223.26 Determination of molybdenum content in steel and alloys - Thiocyanate spectrophotometric method GB/T 223.36 Chemical analysis methods for iron, steel and alloys - Separation by distillation - Neutralization titration method for determination of nitrogen content GB/T 223.37 Determination of nitrogen content in steel and alloys - Indigo blue spectrophotometric method by distillation separation (GB/T 223.37-2020, ISO

4945:2018, IDT) GB/T 223.40 Determination of niobium content in iron, steel and alloys - Chlorosulfonphenol S spectrophotometric method GB/T 223.53 Chemical analysis methods for iron, steel and alloys - Determination of copper content by flame atomic absorption spectrophotometry GB/T 223.60 Chemical analysis methods for iron, steel and alloys - Determination of silicon content by perchloric acid dehydration gravimetric method GB/T 223.62 Methods for chemical analysis of iron, steel and alloys - Determination of phosphorus content by butyl acetate extraction photometric method GB/T 223.64 Determination of manganese content in steel and alloys - Flame atomic absorption spectrometry (GB/T 223.64-2008, ISO 10700:1994, IDT) GB/T 223.69 Determination of carbon content in steel and alloys - Gas volumetric method after combustion in a tube furnace GB/T 223.72 Determination of sulfur content of steel and alloys by gravimetric method