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

GB/T 35012-2018

**Chromium molybdenum alloy steel plate for hydrogen service
equipment**

(English Translation)

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1 Scope

This Standard specifies the ordering content, designation representation, dimensions, shape, weight and tolerances, technical requirements, test methods, inspection rules, packaging, marking, and quality certificate, etc. of chromium molybdenum alloy steel plate for hydrogen service equipment.

This Standard is applicable to the manufacture of chromium molybdenum alloy steel plate (hereinafter known as steel plate for short) with a thickness of 6 mm

~ 200 mm for hydrogen service equipment of petrochemical and coal chemical industry.

2 Normative references

The following documents are indispensable for the application of this document.

For the dated references, only the versions with the dates indicated are applicable to this document. For the undated references, the latest version (including all the amendments) are applicable to this document.

GB/T 223.9 Iron steel and alloy - Determination of aluminium content -

Chrome azurol S photometric method

GB/T 223.11 Iron, steel and alloy - Determination of chromium content -

Visual titration or potentiometric titration method

GB/T 223.14 Methods for chemical analysis of iron, steel and alloy - The N-benzoyl-N-phenylhydroxylamine extraction photometric method for the determination of vanadium content

GB/T 223.17 Methods for chemical analysis of iron, steel and alloy - The diantipyrylmethane photometric method for the determination of titanium content

GB/T 223.18 Methods for Chemical Analysis of Iron, Steel and Alloy - The Sodium Thiosulfate Separation Iodimetric Method for the Determination of Copper Content

GB/T 223.23 Iron, Steel and Alloy - Determination of Nickel Content - The Dimethylglyoxime Spectrophotometric Method

GB/T 223.26 Iron, Steel and Alloy - Determination of Molybdenum Content - The Thiocyanate Spectrophotometric Method

GB/T 223.31 Iron, steel and alloy - Determination of arsenic content - Distillation-molybdenum blue spectrophotometric method

GB/T 223.37 Methods for chemical analysis of iron, steel and alloy - The indophenol blue photometric methods for the determination of nitrogen content after distillation separation

GB/T 223.40 Iron, Steel and Alloy - Determination of Niobium Content by the Sulphochlorophenol S Spectrophotometric Method

GB/T 223.47 Methods for chemical analysis of iron, steel and alloy - The carrier precipitation-molybdenum blue photometric method for the determination of antimony content

GB/T 223.50 Methods for chemical analysis of iron, steel and alloy - The phenylfluorone-CTMAB direct photometric method for the determination of tin content

GB/T 223.60 Methods for chemical analysis of iron, steel and alloy - The perchloric acid dehydration gravimetric method for the determination of silicon content

GB/T 223.62 Methods for chemical analysis of iron, steel and alloy - The butyl acetate extraction photometric method for the determination of phosphorus content

GB/T 223.63 Methods for chemical analysis of iron, steel and alloy - The sodium (potassium) periodate photometric method for the determination of manganese content

GB/T 223.67 Iron, Steel and Alloy - Determination of Sulfur Content -

Methylene Blue Spectrophotometric Method

GB/T 223.69 Iron, Steel and Alloy - Determination of Carbon Contents - Gas- volumetric Method after Combustion in the Pipe Furnace

GB/T 223.75 Iron, steel and alloy - Determination of boron content - Methanol distillation-curcumin photometric method

GB/T 223.76 Methods for chemical analysis iron, steel and alloy - The flame atomic absorption spectrometric method for the determination of vanadium content

GB/T 223.77 Methods for chemical analysis of iron, steel and alloy - The

GB/T 17505 Steel and steel products - General technical delivery requirements

GB/T 20066 Steel and Iron - Sampling and Preparation of Samples for the Determination of Chemical Composition

GB/T 20123 Steel and iron - Determination of total carbon and sulfur content

Infrared absorption method after combustion in an induction furnace (routine method)

GB/T 20124 Steel and iron - Determination of nitrogen content - Thermal conductimetric method after fusion in a current of inert gas

NB/T 47013.3-2015 Nondestructive testing of pressure equipment - Part 3.

Ultrasonic testing

3 Ordering content

Contracts or orders for ordering in accordance with this Standard shall include the following.

- a) Standard number;
- b) Designation;
- c) Dimensions;
- d) Delivery state;
- e) Weight;
- f) Impact test temperature of 14Cr1MoR(H);
- g) Specific holding temperature of 15CrMoR(H), 14Cr1MoR(H) in Table 8;
- h) The heating rate, cooling rate, and holding time in Table 8;
- i) Whether 12Cr2Mo1R(H), 12Cr2Mo1VR(H) are subjected to a step cooling test;
- j) Sampling quantity and inspection location for Brinell hardness in Table 9;

k) Special requirements.

6.6 Nondestructive testing

The steel plate shall be subjected to ultrasonic testing one by one and shall comply with the Class I requirements of NB/T 47013.3-2015.

6.7 Surface quality

6.7.1

There shall be no defects which affect the use such as cracks, bubbles, scarring, folding, and inclusions on the surface of steel plate. The steel plate shall not have visible delamination. If there are the above surface defects, cleaning is allowed. The cleaning depth is calculated from the actual dimension of steel plate and shall not exceed half the thickness tolerance of the steel plate;

and the minimum thickness of the steel plate shall be ensured. The defect cleaning area shall be smooth and free of edges and corners.

6.7.2

Other defects are allowed. The depth is calculated from the actual dimension of steel plate and shall not exceed half the allowable tolerance of the thickness. It shall ensure that the thickness of steel plate at the defect is not less than the minimum allowable thickness of the steel plate.

6.7.3

Steel plates are not allowed to be welding-repaired.

6.8 Step cooling test

According to the requirements of the purchaser and stated in the contract,

12Cr2Mo1R(H) and 12Cr2Mo1VR(H) shall be subjected to step cooling test in accordance with Appendix B. SEE Appendix A for the definition of step cooling heat treatment.

6.9 Special requirements

According to the requirements of the purchaser, negotiated between the supplier and the purchaser and indicated in the contract, the corresponding special requirements shall be selected according to Appendix C.

7 Test methods