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

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Wire rods for welding

焊接用钢盘条

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1 Scope

This document specifies the method for designation of grades, order contents, manufacturing process, technical requirements, test methods, inspection rules, packaging, marking and quality certificate for wire rods for welding.

This document is applicable to steel wire rods (hereinafter referred to as "wire rods") used in the manufacture of welding consumables for processes such as shielded metal arc welding, submerged arc welding, electroslag welding, gas-shielded arc welding, laser-hybrid welding, and additive manufacturing.

2 Normative References

GB/T 223

GB/T 228.1

GB/T 2101

GB/T 2975

GB/T 4336

GB/T 10561

GB/T 13298

GB/T 14981-2009

GB/T 20066

GB/T 20123

GB/T 20125

GB/T 20126

GB/T 22368

3 Terms and Definitions

This document contains no terms or definitions that require clarification.

4 Method for Designation of Grades

The grade designation for wire rods for welding consists of four parts.

a) Part 1: The capital letter "H", representing the initial Pinyin letter of the Chinese character "Han" (meaning "welding") in the term "steel for welding";

b) Part 2: Carbon content (mass fraction);

c) Part 3: Major alloying elements, arranged in the following order. Mn, Si, Cr, Ni, Mo, Cu, V, Ti, B, Zr, and Al. Elements not explicitly listed are arranged sequentially after Al, based on the descending order of their content levels;

d) Part 4: The metallurgical quality of the steel. Specifically, regarding metallurgical quality, "high-grade quality steel" and "special-grade quality steel" are denoted by the letters "A" and "E", respectively, while "quality steel" is indicated by the absence of a specific letter designation. Example 1.H08MnSiNiCu. H -- "Steel for welding";

08 -- Carbon content (mass fraction);

MnSiNiCu -- Major alloying elements. Example 2.H08MnSiCrNiCuA. H -- "Steel for welding";

08 -- Carbon content (mass fraction);

MnSiCrNiCu -- Major alloying elements;

A -- High-grade quality steel.

5 Order Contents

Contracts for orders placed in accordance with this document shall include, at a minimum, the following details.

- a) Product name;
- b) Number of this document;
- c) Grade;
- d) Specification;
- e) Delivery condition;
- f) Delivery weight (or quantity);
- g) Special requirements.

6.1 Smelting Method

Steel used for wire rods is typically smelted using oxygen converters or electric furnaces.

6.2 Delivery Condition

Wire rods shall be delivered in the hot-rolled condition; however, subject to agreement between the supply and demand sides, they may also be delivered in conditions such as annealed or isothermally heat-treated states.

7.1 Grades and Chemical Composition

7.1.1 The grades and chemical composition (product analysis) of the wire rods shall comply with the provisions of Table 1.

7.1.2 The supplier shall guarantee that the chemical composition (product analysis) of the wire rods complies with the provisions of Table 1; however, subject to agreement between the supply and demand sides-and explicitly stated in the contract-delivery based on chemical composition (melting analysis) is also permissible.

7.1.3 Subject to agreement between the supply and demand sides-and explicitly stated in the contract-wire rods of other grades and chemical compositions may also be supplied.

7.2 Surface Quality

7.2.1 Harmful defects at the head and tail ends of the wire rods shall be cropped off; the cross-section shall be free of shrinkage cavities, laminations, and inclusions.

7.2.2 The surface of the wire rods shall be smooth and free of defects harmful to their intended use, such as cracks, folds, fins, and scabs. Localized indentations, protrusions, pits, scratches, and roughness shall have a depth or height (measured from the actual dimension) not exceeding 0.10 mm.

7.3.1 Dimensions and shape of wire rods

The dimensions and shape of the wire rods shall comply with the requirements for Grade B or Grade C precision as specified in GB/T 14981-2009. The specific precision grade required shall be explicitly stated in the contract or agreement; in the absence of such a specification, the requirements for Grade B precision shall apply.

7.3.2 Weight of coils

Each coil shall consist of a single continuous wire rod and shall contain no joints; the minimum weight of each wire rod coil shall be no less than 1 000 kg. In the event of special requirements, these shall be determined through negotiation between the supply and demand sides and explicitly stated in the contract or agreement.

7.4.1 For wire rods delivered in the isothermally heat-treated condition, the mechanical

properties of grades H08Mn2Si, H07Mn2Si, and H08MnSiCrNiCuE shall comply with the provisions of Appendix A.

7.4.2 The supplier shall provide test data regarding the tensile strength and reduction of area of the wire rods; furthermore, upon the demander's request, inspections for non-metallic inclusions, microstructure, and other characteristics may be conducted. The specific criteria for these inspections shall be established through mutual agreement between the supply and demand sides and explicitly stipulated in the contract.

8 Test Methods

8.1 The inspection items, sample sizes, sampling methods, and test methods for the wire rods shall comply with the provisions of Table 2.

8.2 Chemical analysis shall be performed in accordance with general methods such as those