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Replacing GB/T 4241-2006

Stainless steel wire rods for welding

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(ISO 14343:2009, Welding consumables - Wire electrodes, strip electrodes, wires and rods for arc welding of stainless and heat resisting steels - Classification, MOD)

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Foreword

This Standard is drafted in accordance with the rules given in GB/T 1.1-2009.

This Standard replaces GB/T 4241-2006 “Stainless steel wire rods for welding”.

Compared with GB/T 4241-2006, the main changes of this Standard are as follows:

- EXPAND the diameter range of wire rods from 5 mm ~ 20 mm in the original standard to 4.5 mm ~ 20 mm;

- IMPROVE the requirements for mass of wire coils;

- DELETE 9 designations, i.e. H08Cr21Ni10, H03Cr21Ni10, H12Cr24Ni13, H03Cr24Ni13, H12Cr26Ni21, H08Cr19Ni12Mo2, H03Cr19Ni12Mo2 with Si ≤ 0.35 % and H06Cr14 and H08Cr11Nb that are unused for long periods; ADD 18 designations, i.e. H09Cr21Ni9Mn7Si, H16Cr19Ni9Mn7, H022Cr22Ni11, H022Cr24Ni13Nb, H022Cr21Ni12Nb, H022Cr21Ni13Mo3, H022Cr26Ni21, H022Cr20Ni16Mn7Mo3N, H022Cr19Ni12Mo2Nb, H022Cr20Ni10Nb, H011Cr33Ni31MoCuN, H10Cr22Ni21Mo3, H022Cr25Ni9Mo3N, H10Cr12Nb, H08Cr17Nb, H022Cr17Nb, H03Cr18Ti, 022Cr13Ni4Mo; the number of designations is increased from 59 in the original standard to 68;

- Chemical composition analysis is modified from smelting analysis to finished product analysis; CANCEL the allowable deviation of the chemical composition of finished products;

- CANCEL the requirements for macrostructures in the standard, and MOVE it to special requirements;

- ADD Annex A (normative) “Comparison between designations of this Standard and designations of the original standard".

This Standard uses the re-drafting method to modify and adopt ISO 14343:2009 “Welding consumables - Wire electrodes, strip electrodes, wires and rods for arc welding of stainless and heat resisting steels - Classification”.

For convenience of comparison, this Standard gives a table of comparison between clauses of this standard and clauses of ISO 14343:2009 in Annex C.

According to China’s national conditions, this Standard has modified ISO 14343:2009 when adopting it. These technical differences are identified by the vertical single line in the margins of the clauses in which they relate. A table of technical differences and their causes is given in Annex D for reference.

This Standard is proposed by China Iron and Steel Association.

Stainless steel wire rods for welding

1 Scope

This Standard specifies the classification, designation, order content, dimension, shape, technical requirements, test methods, inspection rules, packaging, marking and quality certificates of stainless steel wire rods for welding.

This Standard applies to stainless steel wire rods for welding of core wires of welding electrodes, gas shielded welding wires, submerged arc welding wires, electroslag welding wires, etc.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the dated edition cited applies. For undated references, the latest edition of the referenced document (including all amendments) applies.

GB/T 223.4 Alloyed steel - Determination of manganese content - Potentiometric or visual titration method

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 223.11-2008, ISO 4937:1986, MOD)

GB/T 223.16 Methods for chemical analysis of iron, steel and alloy - The chromotropic acid 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 223.20 Methods for chemical analysis of iron, steel and alloy - The Potentiometric titration method for the determination of cobalt content

GB/T 223.23 Iron, steel and alloy - Determination of nickel content - The dimethylglyoxime spectrophotometric method

GB/T 223.25 Methods for chemical analysis of iron, steel and alloy - The

dimethylglyoxime gravimetric method for the determination of nickel content

GB/T 223.26 Iron, steel and alloy - Determination of molybdenum content - The thiocyanate spectrophotometric method

GB/T 223.28 Methods for chemical analysis of iron, steel and alloy - The α-benzoinoxime gravimetric method for the determination of molybdenum content

GB/T 223.30 Methods for chemical analysis of iron, steel and alloy - The arsenazo III spectrophotometric method for the determination of zirconium content after separation by p-bromomandelic acid

GB/T 223.36 Methods for chemical analysis of iron, steel and alloy - The neutral titration method for the determination of nitrogen content after distillation separation

GB/T 223.40 Iron, steel and alloy - Determination of niobium content - The sulphochlorophenol S spectrophotometric method

GB/T 223.41 Methods for chemical analysis of iron, steel and alloy - The anion-exchange separation-pyrogallol photometric method for the determination of tantalum content

GB/T 223.43 Iron, steel and alloy - Determination of tungsten content - Gravimetric method and spectrophotometric method

GB/T 223.49 Methods for chemical analysis of iron, steel and alloy - Extraction separation-chlorophosphonazo mA spectro-photometric method for the determination of the total rare earth 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 223.61 Methods for chemical analysis of iron, steel and alloy - The ammonium phosphomolybdate volumetric method for the determination of phosphorus content

GB/T 223.64 Iron, steel and alloyed - Determination of manganese content - Flame atomic absorption spectrometric method (GB/T 223.64-2008, ISO 10700:1994, IDT)

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

GB/T 223.81 Iron, steel and alloy - Determination of total aluminum and total boron contents - Microwave digestion - inductively coupled plasma mass spectrometric method

GB/T 223.85 Steel and iron - Determination of sulfur content - Infrared absorption method after combustion in an induction furnace (GB/T 223.85-2009, ISO

4935:1989, IDT)

GB/T 223.86 Steel and iron - Determination of total carbon content - Infrared absorption method after combustion in an induction furnace (GB/T 223.86-2009, ISO 9556:1989, IDT)

GB/T 226 Test method for macrostructure and defect of steel by etching

GB/T 1979 Standard diagrams for macrostructure and defect of structural steels

GB/T 2101 General requirement of acceptance, packaging, marking, and certification for section steel

GB/T 11170 Stainless steel - Determination of multi-element contents - Spark discharge atomic emission spectrometric method (Routine method)

GB/T 14981-2009 Dimension, shape, mass and tolerance for hot-rolled round wire rod (GB/T 14981-2009, ISO 16124:2004, MOD)

GB/T 17505 Steel and steel products - General technical delivery requirements (GB/T 17505-1998, ISO 404:1992, EQV)

GB/T 20066 Steel and iron - Sampling and preparation of samples for the determination of chemical composition (GB/T 20066-2006, ISO 14284:1996, IDT)

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 20123-2006, ISO 15350:2000, IDT)

GB/T 20124 Steel and iron - Determination of nitrogen content - Thermal conductimetric method after fusion in a current of inert gas (routine method) (GB/T 20124-2006, ISO 15351:1999, IDT)

3 Classification, designation

The wire robs are divided into austenitic, austenitic + ferritic (biphasic), martensitic, ferritic and precipitation-hardening types according to the texture. The designations are shown in Table 1 to Table 5.

4 Order content

The contract ordered in accordance with this Standard shall contain the following:

a) serial number of this Standard;

b) designation;

c) specification;

d) mass;

e) dimensional accuracy level;

f) delivery status;

g) smelting method;

h) other special requirements.

5 Dimension, shape, mass and allowable deviation

5.1 The nominal diameter range of wire rods is from 4.5 mm to 20 mm.

5.2 The allowable deviation of diameter and out-of-roundness of wire rods shall comply with the provisions of GB/T 14981-2009 (4.5 mm in diameter according to 5 mm). The accuracy level of specific requirements shall be specified in the contract, if not, it shall comply with the provisions of level B accuracy.

5.3 The mass of wire rod coils shall comply with the following provisions:

Each coil consists of a wire rod, the mass of wire rod shall be not less than 1000 kg. Under the following two circumstances, the delivery is allowed, but the total number of wire rod coils shall not exceed 5 % of the number of wire rod coils in each batch (2 coils are allowed for those less than 2 coils):

a) wire rod coils consist of a wire rod with the mass less than 1000 kg but more than 800 kg;

b) wire rod coils consist of two wire rods with the mass not less than 1000 kg, the mass of each wire rod coil not less than 300 kg, and a clear marking.

6 Technical requirements

6.1 Designation and chemical composition

The designation and chemical composition (finished product analysis) of wire rods shall comply with the provisions of Tables 1 to 5.

6.2 Smelting method

Steels shall be smelted using electric furnace or converter + furnace refining,

GB/T 223.41, GB/T 223.43, GB/T223.49, GB/T 223.60, GB/T 223.61, GB/T 223.64, GB/T 223.76, GB/T 223.81, GB/T 223.85, GB/T 223.86 or general method such as GB/T 11170, GB/T 20123, GB/T 20124.

The arbitration shall be carried out according to GB/T 223.4, GB/T 223.9, GB/T 223.11, GB/T 223.16, GB/T 223.18, GB/T 223.20, GB/T 223.23, GB/T 223.25, GB/T 223.26, GB/T 223.28, GB/T 223.30, GB/T 223.36, GB/T 223.40, GB/T 223.41, GB/T 223.43, GB/T 223.49, GB/ T223.60, GB/T 223.61, GB/T 223.64, GB/T 223.76, GB/T 223.81, GB/T 223.85, GB/T 223.86.

8 Inspection rules

8.1 Inspection and acceptance

8.1.1 The inspection and acceptance of wire rods before exiting factory are carried out by the supply party's quality supervision department.

8.1.2 The supply party shall ensure that the delivered wire rods comply with the provisions of this Standard or the contract and, if necessary, the demand party shall have the right to inspect and accept any of the inspection items specified in this Standard or the contract.

8.2 Batching rules

Wire rods shall be inspected and accepted in batches, and each batch shall consist of wire rods of the same designation, the same furnace number, the same dimension and the same delivery status. Steels smelted by electroslag remelting are allowed to be delivered in batches of melting furnace number of consumable electrode, under the condition that the process is stable and the requirements of this standard can be guaranteed.

8.3 Sampling quantity and sampling site

The sampling quantity and sampling site of each batch of wire rods shall comply with the provisions of Table 7. When electroslag steels are batched according to the main smelting furnace, the sampling shall be carried out according to the provisions for electric furnace steels in Table 7; but for chemical composition it shall take 1 sample from each electroslag furnace batch. When electroslag steels are batched according to the secondary furnace, the sampling shall be carried out according to the provisions for electric furnace steels in Table 7.

8.4 Re-inspection and determination rules

The re-inspection and determination rules of wire rods shall be carried out according to the provisions of GB/T 17505.