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Steel and Steel Products – General Technical Delivery Requirements

钢及钢产品 交货一般技术要求

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Foreword

This Standard equivalently adopts ISO 404:1992 "Steel and Steel Products - General Technical Delivery Requirements".

The main technical contents of this Standard, such as production process, goods delivered by processors or middleman, requirements, inspection and testing, classification and re-processing, marking and objections, equivalently adopts ISO 404. According to China's actual situation, this Standard adds the provisions of 8.3.4.3.1, namely, the requirements that the white flake is not allowed to be re-inspected. In the meanwhile, the referenced international standards are changed into the relevant national standards; and Annex A (Informative) "Reference" and Annex B (Informative) "Primary Standards of Steel Test and Analysis" are deleted.

This Standard must be used together with other technical standards; as a supplement, it cannot be used independently for order.

This Standard was proposed by and shall be under the jurisdiction of the National Steel Standardization Technical Committee.

Main drafting organization of this Standard: China Metallurgical Information and Standardization Research Institute.

Main drafting staffs of this Standard: Wang Limin and Luan Yan.

Steel and Steel Products – General Technical Delivery Requirements

1 Scope

This Standard specifies the general technical delivery requirements of all steel and steel products included in GB/T 15574, except cast steel and sintered metal products.

When the provisions of the product standard or the agreement of the contract are not consistent with the provisions of this Standard, the requirements shall be based on the product standard and the contract agreement.

2 Normative references

The following standards contain the provisions which, through reference in this text, constitute the provisions of this Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision; the parties who reach an agreement based on this Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

GB/T 222-1984 Method of Sampling Steel for Determination of Chemical Composition and Permissible Variations for Product Analysis

GB/T 2975-1998 Steel and Steel Products - Location and Preparation of Test Pieces for Mechanical Testing

GB/T 13304-1991 Steels - Classification

GB/T 15574-1995 Steel Products Classification and Definitions

GB/T 19001-1994 Quality Systems - Model for Quality Assurance in Design, Development, Production, Installation and Servicing

GB/T 19002-1994 Quality Systems - Model for Quality Assurance in Production, Installation and Servicing

GB/T 19003-1994 Quality Systems - Model for Quality Assurance in Final Inspection and Test

YB/T 081-1996 Rule for Rounding Off of Numerical Values and Judgement of

Testing Values for Technical Standards of Metallurgy

3 Definitions

Except the definitions specified in GB/T 13304 and GB/T 15574, this Standard shall also adopt the following definitions:

3.1 Inspection

Inspection refers to the activity that determines, inspects, tests and measures one or more of characteristic values of a sort of product or service, and makes comparison with the specified value, so as to determine whether this activity is eligible.

3.2 Testing

Testing refers to all operations or activities for the determination of one or more of performance and characteristic values of a sort of material or product.

3.3 Continuous Inspection

Continuous inspection refers to the characteristic value of bulked products with long manufacturing cycle and implementing the same standard, or the routine inspection and testing made by process parameter. The testing and inspection are made according to the procedures agreed on by both the supplier and the purchaser, of which the following content shall be included:

- a) The characteristic value or process parameter of the testing or inspection;
- b) Product condition of the testing and inspection;
- c) The assessment of the test result (routine statistical assessment);
- d) The user is entitled with the legal testing and inspection rights.

3.4 Non-specific Inspection and Testing

Non-specific inspection and testing refers to the inspection and testing made by the set procedure, so as to judge whether the products produced by the same production process meets the requirements of the contract. The inspected and tested products may not be the actual supplied products.

3.5 Specific Inspection and Testing

Specific inspection and testing refers to the inspection and testing made on the delivered products or parts of the products based on the technical requirements of the contract before the delivery, so as to verify whether they meet the requirements of the contract.

The contract shall clearly indicate all contents that are required to describe the product features and the following details related to the delivery:

- a) Delivery weight, length, area and quantity;
- b) Product shape (such as: drawing number);
- c) Nominal dimension;
- d) Tolerance of characteristic values a) and c);
- e) Grade of steel;
- f) Delivery state (such as heat treatment and surface-treatment ways);
- g) Special requirements of surface and internal quality (see 7.4);
- h) The type of the document requires inspection, and the inspection and testing requirements not specified in the product standard (see Chapter 8);
- i) If necessary, quality assurance system of any applied one of GB/T 19001, GB/T 19002 and GB/T 19003 may be adopted;
- j) Marking, packaging and shipping;
- k) Any selection requirements proposed by the product standard or any additional provisions not included in the product standard.

4.2 The contents that shall be specified in Article 4.1:

- a) Adopt one or several national (industry) standards;
- b) When standards are not available, the characteristic value and clauses specified in the contract;
- c) In case the standard cited in the contract is not indicated with date of issuance, the effective version when signing the contract shall be adopted. In the event of any objections to the current standard version, the version used shall be negotiated by supplier and purchaser.

5 Production Process

Unless there is an agreement when ordering, or as otherwise provided in the product standards, the manufacturing process shall be selected by the production plant.

Note: The manufacturing process includes all the processes from the steel-making to the products delivery.

be denoted by all single test average values measured by 8.3.4.2.

7.4 Surface quality and internal quality

7.4.1 General requirements

All products shall be good in quality, if slight surface or internal defects arisen from normal production condition, this cannot be used as the reason for rejection.

If necessary, the specific requirements of the surface quality and internal quality shall refer to the corresponding standards, which shall be determined by negotiation when signing the contract.

7.4.2 Flaw detection

If necessary, the special techniques adopted for the defects detection (such as X-ray inspection, ultrasonic inspection and magnetic particle inspection), the product quantity of the test unit and methods for test result handling shall all be determined according to the provisions of product standard or negotiated through ordering.

7.4.3 Discontinuous removal of surface

Unless otherwise specified in the standards or contract, the discontinuity of the surface may be removed by mechanical methods and other methods, but the product size and performance shall be ensured to comply with the limitation stipulated in the contract, product standard, dimensional standard or surface quality standard.

7.4.4 Weld repairs

If the product standard or contract allows the weld repair, the user and inspection representative shall allow the sectional repair for all or parts of the delivered batches with welding method.

8 Inspection and Testing

8.1 Type of Inspection Document, Inspection and Testing

8.1.1 When signing the contract, if necessary, the users shall indicate clearly the type of the inspection document (see 4.1h), and explain the required inspection and testing type, that is, non-specific inspection and testing or specific inspection and testing. The non-specific inspection and testing shall comply with the requirements of Article 8.2, while the specific inspection and testing shall comply with the requirements of Article 8.3.

8.1.2 In exceptional circumstances, the specific inspection and testing may be replaced by continuous inspection (see 3.3) made by the production plant.

normal processes running, the production plant and inspection representative shall negotiate to determine the inspection and testing time or on agreed date. If there is no clearly explanation, or the external inspection representative is absent in the appointed inspection and testing time, the representative commissioned by the production plant may make the acceptance self-inspection, and then, provide those inspection documents to the user or representative. Before the inspection and testing work, the effective document of the contract shall be submitted to the inspection representative.

8.3.1.4 Right and obligation of the inspection representative

In order to carry out the agreed inspection and testing, at the agreed time, the inspection representative shall be able to freely access the production plant and storeroom for the required inspection and product testing; the inspection representative may select the sample product from the test unit according to relevant regulations, and cut sample; the inspection representative is also entitled to take part in the selection, preparation (cutting and processing) and test work of the test piece. The inspection representative shall be abided by all relevant systems of the production plant, especially the relevant safety codes. The production plant is entitled to accompany any inspection representative. When making the testing and inspection, the interference to the normal production operation shall be minimized.

8.3.1.5 Traceability in the testing

In the testing process, the production plant shall ensure the traceability among the sample product, sample, test piece and the plant-based test unit.

8.3.2 Testing frequency

8.3.2.1 Composition of the test unit

For the testing, the test unit shall be specified in the product standard or contract. Generally, the test unit consists of the following components:

- a) The same smelting furnace number;
- b) The same furnace tank number;
- c) The same heat treatment condition or heat treatment furnace batch;
- d) The same shape;
- e) The same thickness.

Test unit batch may be restricted either by weight or by pieces. In some cases, the test unit is composed of single pieces of products.

- a) Average value of one group (three test pieces) shall meet the requirements of the specified minimum value, in which, one single test piece value is allowed to be lower than the specified value, but not less than 70% of the specified value;
- b) If the above requirement cannot be met, the test piece less than the specified minimum value is not more than 2, and the test piece less than 70% of the specified value is not more than 1, the production plant may sample a group (three test pieces) from the same sample products; after the testing for the second group of test pieces, if the following conditions are met in the same time, then the test unit may be accepted:
 - 1) The average value of the six test pieces shall not be less than the specified minimum value;
 - 2) The test piece less than the specified minimum value shall not be more than 2;
 - 3) The test piece less than 70% of the specified value shall not be more than 1.
- c) If the above conditions cannot be met, the sample products shall be rejected, and then, resample from the rest of the test pieces to make the re-inspection (see 8.3.4.3.3).

Assessment of the testing result, such as tension test in the thickness direction, shall be made according to the above similar approach.

8.3.4.3 Re-inspection

8.3.4.3.1 General requirements

When one or several testing results do not meet the requirements, the production plant may judge the corresponding test unit to scrap, or may require re-inspection according to provisions of 8.3.4.3.2 and 8.3.4.3.3, except for the following special circumstances. However, the re-inspection cannot be carried out when white flake appears.

If the test results deviate significantly from the specified value of the delivery steel grade, it is reasonable to suspect that the products have been mixed in grades, by then, the methods specified in Chapter 9 shall be adopted.

8.3.4.3.2 Non-sequential testing

If the failed results are not calculated from the average, but from the testing, and only a single value is provided (for example, tensile test, bending test or end hardenability), then the following methods shall be adopted:

- a) Test unit is a single product (see Figure 2), so same type of double testing shall

be made for the disqualified item, and the double testing shall all be qualified, otherwise, the product shall be rejected;

b) If the test unit is not composed by single piece of product, such as the same rolling batch, casting batch or heat treatment condition (see Figure 3), unless otherwise agreed, the supplier may pick out the sample product from the test unit, or may not pick out.

1) If the sample product is picked out from the test unit, the inspection representative shall select other two sample products from the same test unit, and then, prepare the test pieces from the two sample products respectively. Make once the same kind of testing under the same condition as the first one, and the testing result shall all be qualified;

2) If the sample product remains in the test unit, it shall be made according to the processes specified in 1). However, one of the re-selected test pieces must be cut from the sample product in the test unit, and the testing result shall all be qualified.

8.3.4.3.3 Sequential testing

When the testing result obtained by the sequential testing results are unqualified (see Figure 4), such as the impact test specified by 8.3.4.2, it shall be carried out according to the following requirements.

The sample product with unqualified testing results shall be picked out for rejection, and then, according to the methods specified in 8.3.4.3.2b) 1), take 2 sample products from the rest of the test unit, select a group (3 pieces of test pieces) from each sample product; the testing results of the two groups of test pieces shall all comply with the requirements of 8.3.4.3.2a); 8.3.4.3.2b) can not be re-used for judgment.

8.4 Invalidation of Testing Results

The testing results obtained from inappropriate sampling, preparing and testing shall be deemed as invalid.

8.5 Rounding-off of Mechanical and Chemical Testing Results

Unless otherwise stated on the contract or product standard, when the testing result must be assessed to see whether it complies with the specified value, the given mechanical and chemical testing results shall be rounded-off to be consistent with the digital number marked by the standard specified number; the rounding-off method shall comply with YB/T 081.

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Contact: Wayne Zheng, Sales@ChineseStandard.net

Linkin: <https://www.linkedin.com/in/waynezhengwenrui/>

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