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

GB/T 5213-2019

Cold rolled low carbon steel sheet and strip

冷轧低碳钢板及钢带

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Foreword

This Standard was drafted in accordance with the rules given in GB/T 1.1-2009. This Standard replaces GB/T 5213-2008, Cold rolled low carbon steel sheet and strip. Compared with GB/T 5213-2008, in addition to editorial changes, the major technical changes are as follows: -- it changes the scope of application and the range of nominal thickness (see Clause 1; Clause 1 of 2008 edition); -- it changes the lower limit requirements for the tensile strength of designation DC06 (see Table 4; Table 4 of 2008 edition); -- in accordance with the divisions of different class intervals of nominal thickness, it adds the requirements for percentage elongation after fracture (see Table 4); -- it adds the requirements for the tensile strain mark surface quality assurance of the FC surface of designation DC01 (see Table 5); -- it adds the requirements for "surface quality", "dimensions" and their corresponding test methods in the inspection items of Table 7 (see Table 7); -- it changes the requirements for the reference values of some chemical components in Annex A (see Annex A; Annex A of 2008 edition); -- it changes the cross-reference table of similar domestic and foreign designations in Annex B (see Annex A; Annex A of 2008 edition). This Standard was proposed by the China Iron and Steel Association. This Standard shall be under the jurisdiction of National Technical Committee 183 on Steels of Standardization Administration of China (SAC/TC 183). The drafting organizations of this Standard. Baoshan Iron and Steel Co., Ltd., China Metallurgical Information and Standardization Institute, Jiangsu Shagang Group Co., Ltd., Zhangjiagang

Yangtze Cold Rolled Sheet Co., Ltd., Shandong Taishan Iron and Steel Group Co., Ltd., Guangxi Liuzhou Iron and Steel Group Co., Ltd. The main drafters of this Standard. Zhu Yan, Yuan Min, Li Qian, Li Ran, Nie Wenjin, Hu Yanhui, Huang Yanfei, Chen Hai, Tu Shulin, Zhang Weixu, Li Xiaobo, Zhao Qishao, Wu Yuhong, Deng Shen, Hu Ling, Huang Jinhua, Hou Jie, Xu Qing. The previous editions of the standard replaced by this Standard are as follows: -- GB/T 5213-1985, GB/T 5213-2001, GB/T 5213-2008. Cold rolled low carbon steel sheet and strip

1 Scope

China's national standard for cold rolled low carbon steel sheet and strip. This is the most-produced engineered steel product in the world and the material of car bodies, appliances, furniture, and everything made from pressed sheet. Cold rolling is what distinguishes it: rolled below the recrystallisation temperature, the strip acquires a close thickness tolerance, a flat shape and a clean bright surface that hot rolled material cannot have, and after annealing it is soft enough to be pressed into deep shapes. The grades within the standard differ by how far they can be drawn, which depends on the steel's crystallographic texture rather than on its strength, and that texture is the product of the annealing rather than of the composition. The standard specifies the terms and definitions, classification and designations, ordering content, dimensions, shape, weight, technical requirements, test methods, inspection rules, packaging, marking and quality certification for cold rolled low carbon sheet and strip.

This Standard specifies the terms and definitions, classification and designation, ordering content, dimensions, shape, weight, technical requirements, test methods, inspection rules, packaging, marking and quality certification of cold rolled low carbon steel plates (sheets) and strips.

2 Normative references

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

GB/T 223.9, Iron steel and alloy - Determination of aluminium content - Chrome azurol S photometric method

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 223.40, Methods for chemical analysis of iron, steel and alloy - The anion- exchange separation-sulphochlorophenol S photometric method for the determination of niobium content

GB/T 223.59, Iron, steel and alloy - Determination of phosphorus content - Bismuth phosphomolybdate blue spectrophotometric method and antimony phosphomolybdate blue spectrophotometric method

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

3.1 Classification

3.1.1 For the classification of steel plates (sheets) and strips by use see Table 1.

3.1.2 For the classification of steel plates (sheets) and strips by surface quality see Table 2.

3.1.3 For the classification of steel plates (sheets) and strips by surface structure see Table 3

3.2 Designation Designation of steel plates (sheets) and strips consists of three parts, including. the first part is letter "D", representing steel plates (sheets) for cold forming; the second part is letter "C", representing that it is cold rolling; the third part is a two-digit serial number, i.e. 01, 03, 04, etc.

4 Ordering content

4.1 Contracts or orders based on this Standard shall include the following contents.

4.2 If the information is not indicated in contracts, such as dimensions and roughness accuracy, surface quality grade, surface structure type, rim condition and packaging, the supplier shall supply goods in accordance with common dimensions and roughness accuracy, relatively high-grade surface, pitted surface structure and trimming state, and packaging method of the supplier.

5 Dimensions, shape and weight

The dimensions, shape, weight and tolerances of steel plates (sheets) and strips shall be as specified in GB/T 708.

6 Technical requirements

6.1 Chemical components For the reference values of steel chemical components (by smelting analysis) see Annex A. If the purchaser has any requirement for chemical components, it shall be as agreed on when an order is placed. For the cross-reference table of similar domestic and foreign standard designations refer to Annex B.

6.2 Smelting method Steel used for steel plates (sheets) and strips is smelted using an oxygen converter or electrical furnace; the smelting method is to be selected by the supplier.

6.3 Delivery condition

6.3.1 Steel plates and sheets are delivered in the condition of temper rolling after annealing.

6.3.2 Steel plates (sheets) and strips are usually delivered coating with oil; oil film coated can be removed using aqueous alkali or common solutions; under common packaging, transportation, handling and storage conditions, the supplier shall ensure that, within 6 months after the date of manufacture, steel plates (sheets) and strips does not rust.

6.4 Mechanical properties Mechanical properties of steel plates (sheets) shall be as specified in Table 4.

6.5 Tensile strain marks Tensile strain marks of steel plates (sheets) and strips shall be as specified in Table 5.

6.6 Surface quality

6.7 Surface structure When surface structure is of a pitted surface (D), the target value of average roughness R_a is greater than $0.6\ \mu\text{m}$ but not greater than $1.9\ \mu\text{m}$; when surface structure is of a glossy surface (B), the target value of average roughness R_a is not greater than $0.9\ \mu\text{m}$. If the purchaser has special requirements for roughness, they shall be as agreed on during ordering.

7 Test methods

7.1 Chemical composition test of steel is usually carried out as specified in GB/T 4336, GB/T 20123, GB/T 20125 and GB/T 20126, or general chemical analysis methods; arbitration shall be carried out as specified in GB/T 223.9, GB/T 223.16, GB/T 223.40, GB/T 223.59, GB/T 223.63 and GB/T 20125.

7.2 The inspection items and test methods of steel plates (sheets) and strips shall be as specified in Table 7.

7.3 r_{90} is calculated at 15% of strain; when average elongation is less than 15%, strain is calculated at the end of average elongation.

8 Inspection rules

8.1 Inspection and acceptance of steel plates (sheets) and strips shall be carried out by the inspection department of the supplier.

8.2 Steel plates (sheets) and strips shall be accepted by batch. Each batch for inspection shall consist of steel plates (sheets) and strips of same designation, same specification and same processing condition. Weight of each batch shall not be greater than 30 t; for steel strips with a coil weight greater than 30 t, each coil is a batch for inspection.