GB

NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

ICS 77.140.50
H 46

GB/T 5213-2008

Replacing GB/T 5213-2001

Cold Rolled Low Carbon Steel Sheet and Strip

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Issued on: October 10, 2008 **Implemented on: May 1, 2009**

Issued by: General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China;

Standardization Administration of the People's Republic of China.

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Foreword

Based on the domestic production and use condition of cold rolled low carbon steel sheet and strip, and by reference to the EN 10130:2006 "Cold Rolled Low Carbon Flat Steel for Cold Forming - Technical Delivery Conditions" (English edition), this Standard revised GB/T 5213-2001 "Cold Rolled Sheets and Strips for Deep Drawing".

This Standard replaces GB/T 5213-2001 "Cold Rolled Sheets and Strips for Deep Drawing".

Compared with GB/T 5213-2001, the following main technical contents were revised:

- Revise the standard name as "Cold Rolled Low Carbon Steel Sheet and Strip";
- Modify the designation naming method;
- Add steel grades DC01 and DC03, for general use and drawing; and add the steel grade DC07 for super extra-drawing (SEDDQ);
- Modify the surface quality class from two to three;
- For dimension, shape, weight and permissible deviation, it directly adopts GB/T 708;
- Adjust the requirements of chemical composition;
- Delete the provision that SC1 is divided into three classes - F, HF and ZF according to drawing class; and delete the provision cupping, bending and metallography;
- Add the requirements for surface structure roughness *Ra*;
- For products delivered as steel strips, the defective parts on their surface are changed from 8% to 6% of the length.

Appendixes A and B of this Standard are informative.

This Standard was proposed by China Iron & Steel Association.

This Standard shall be under the jurisdiction of China Steel Standardization Technical Committee.

Responsible drafting organization of this Standard: Baoshan Iron & Steel Co., Ltd.

Participating drafting organizations of this Standard: Angang Steel Company Limited, Maanshan Iron & Steel Co., Ltd. AND China Metallurgical Information and Standardization Institute.

Cold Rolled Low Carbon Steel Sheet and Strip

1 Scope

This Standard specifies the classification and codification, dimension, shape, weight, technical requirements, inspection and test, packaging, marking and quality certificate, etc. for cold rolled low carbon steel sheet and strip (hereinafter referred to as "steel sheets and strips").

This Standard is applicable to cold rolled low carbon steel sheets and strips which are 0.30mm~3.5mm in thickness and used in automobile, household appliance and other industries.

2 Normative References

The following documents contain the provisions which, through reference in this text, constitute the provisions of this Standard. For dated reference, the subsequent amendments (excluding corrigendum) or revisions of these publications do not apply. However, parties who enter into agreement based on this Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. For any undated references, the latest edition of the document referred to applies.

GB/T 223.9 Iron Steel and Alloy - Determination of Aluminium Content - Chrom 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 223.17 Methods for Chemical Analysis of Iron, Steel and Alloy - The Diantipyrylmethane Photometric Method for the Determination of Titanium Content

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

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

GB/T 223.64 Methods for Chemical Analysis of Iron, Steel and Alloy - The Flame Atomic Absorption Spectrometric Method for the Determination of Manganese Content

GB/T 228 Metallic Materials - Tensile Testing at Ambient Temperature (GB/T 228-2002, eqv ISO 6892:1998)

GB/T 247 General Rule of Acceptance, Package, Mark and Certification for Steel Plates (Sheets) and Strips

GB/T 708 Dimension Shape Weight and Tolerance for Cold-rolled Steel Plates and Sheets

GB/T 2523 Cold Rolled Sheet (Strip) - Measuring Method for Surface Roughness

GB/T 2975 Steel and Steel Products - Location and Preparation of Test Pieces for Mechanical Testing (GB/T 2975-1998, eqv ISO 377:1997)

GB/T 4336 Standard Test Method for Spark Discharge Atomic Emission Spectrometric Analysis of Carbon and Low-alloy Steel (Routine Method)

GB/T 5027 Metallic Materials - Sheet and Strip - Determination of Plastic Strain Ratio (r-values) (GB/T 5027-2007, ISO 10113:2006, IDT)

GB/T 5028 Metallic Materials - Sheet and Strip - Determination of Tensile Strain Hardening Exponent (n-values) (GB/T 5028-1999, eqv ISO 10275:1993)

GB/T 8170 Rules for Rounding-off of Numerical Values

GB/T 17505 Steel and Steel Products: General Technical Delivery Requirements (GB/T 17505-1998, eqv ISO 404:1992)

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 20125 Low-alloy Steel - Determination of Multi-element Contents - Inductively Coupled Plasma Atomic Emission Spectrometric Method

GB/T 20126 Unalloyed Steel - Determination of Low Carbon Content - Part 2: Infrared Absorption Method after Combustion in an Induction Furnace (with Preheating)

4 Ordering Information

4.1 For ordering, the user shall provide the following information:

a) product name (steel sheet or strip);

b) standard number of the product;

c) designation;

d) specification, dimension and roughness precision;

e) surface quality class;

f) surface structure;

g) edge condition;

h) manner of packaging;

i) weight;

j) purpose;

k) other special requirements (for example, surface is facing up).

4.2 If information, e.g. dimension and roughness precision, surface quality class, surface structure type, edge condition and packaging, is not specified in the order contract, the products of this Standard shall be supplied as trimmed steel sheets/strips in common size and roughness precision, fairly high class and pitted surface structure, and shall be packed in the manner given by the supplier.

5 Dimensions, Shape, Weight and Permissible Deviation

The dimensions, shape, weight and permissible deviation of steel sheets and strips shall comply with GB/T 708.

6 Technical Requirements

6.1 Chemical composition

See Appendix A for the chemical composition's (smelting analysis) references of steels. If the purchaser has any requirement for chemical composition, it shall be agreed in order.

6.2 Smelting method and manufacturing process

layering.

6.6.2 The surface quality classes and features of steel sheets and strips are shown in Table 6.

6.6.3 For steel strips, the delivery with defect is permitted due to lack of opportunity for cutting off the defective parts, however, the defective parts shall not exceed 6% of the total coil length.

Table 6

Class	Code	Feature
Fairly high-grade surface	FB	A small number of surface defects having no impact on formability and adhesion of coating and plating, e.g. slight scratch, indent, pit, roll mark and oxidation tint are allowed.
High-grade surface	FC	For the both sides of the product, the better one shall be free from obvious visible defect and the other at least shall meet the requirements of FB.
Super high-grade surface	FD	For the both sides of the product, the better one shall be free of any defect, i.e. having no impact on coated or plated appearance quality, and the other shall at least meet the requirements of FB.

6.7 Surface structure

In case of pitted surface structure, the target value of roughness *Ra* is larger than 0.6μm but not larger than 1.9μm; in case of glossy surface structure, it shall not be larger than 0.9μm. If the purchaser has a special requirement of roughness, it shall be agreed in order.

7 Inspection and Test

7.1 Steel sheets and strips are visually inspected for their appearance.

7.2 The dimension and shape of steel sheets and strips are measured with appropriate measuring tools.

7.3 r_{90} value is calculated in 15% strain; where the uniform elongation is less than 15%, it is calculated according to the strain value at the end of uniform elongation. n_{90} value is calculated within 10%~20% strain range; where the uniform elongation is less than 20%, the strain range for calculation shall start from 10% to the end of uniform elongation.

7.4 The inspection item, specimen quantity, sampling method and test method for steel sheets and strips shall meet the requirements of Table 7.

Appendix A (Informative)

Chemical Composition of Steels

A.1 The chemical composition (smelting analysis) references of steels are shown in Table A.1.

Table A.1 **% (Mass fraction)**

Designation	C	Mn	P	S	Al_t[a]	Ti[b]
DC01	≤0.12	≤0.60	≤0.045	≤0.045	≥0.020	—
DC03	≤0.10	≤0.45	≤0.035	≤0.035	≥0.020	—
DC04	≤0.08	≤0.40	≤0.030	≤0.030	≥0.020	—
DC05	≤0.06	≤0.35	≤0.025	≤0.025	≥0.015	—
DC06	≤0.02	≤0.30	≤0.020	≤0.020	≥0.015	≤0.30[c]
DC07	≤0.01	≤0.25	≤0.020	≤0.020	≥0.015	≤0.20[c]

a For designations DC01, DC03 and DC04, if C≤0.01, Al_t≥0.015.

b Nb or Ti may also be added into DC01, DC03, DC04 and DC05.

c It may use Nb to replace some Ti; all the C and N in steels shall be fixed.

Appendix B (Informative)

Cross Reference between Domestic and Foreign Designations

B.1 See Table B.1 for the cross reference of designations between this Standard and the superseded standards as well as domestic and foreign standards.

Table B.1

GB/T 5213-2008	GB/T 5213-2001 GB/T 13237-1991	EN 10130-2006	JIS G 3141-2005	ISO 3574:1999	ASTM A 1008M-07
DC01	08A1	DC01	SPCC	CR1	CS Type C
DC03	—	DC03	SPCD	CR2	CS Type A, B
DC04	SC1	DC04	SPCE	CR3	DS Type A, B
DC05	SC2	DC05	SPCF	CR4	DDS
DC06	SC3	DC06	SPCG	CR5	EDDS
DC07	—	DC07	—	—	—

END

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