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GB/T 3273-2015

Replacing GB/T 3273-2005

Hot-rolled steel plates and strips for automobile frames

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Issued on: September 11, 2015

Implemented on: June 1, 2016

Issued by: General Administration of Quality Supervision, Inspection and Quarantine;

Standardization Administration Committee.

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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 3273-2005 *Hot-rolled steel plates(sheets)and strips for automobile frame*. Compared with GB/T 3273-2005, the main technical changes are as follows:

- added 5 designation: 600L, 650L, 700L, 750L, 800L;
- extended the thickness range of steel plates and strips;
- added relevant contents and requirements for pickling steel plates and strips;
- adjusted chemical composition of designation; reduced contents of C, Si, P, S;
- adjusted micro-alloy content requirements; reduced total content of Nb, V, Ti;
- adjusted requirements for mechanical properties and processing properties of 3 designations;
- added the provisions that if the supplier can ensure qualified bending test, the test can be exempted for bending test;
- added comparison in designation between international standard and European standard.

This Standard was proposed by China Iron and Steel Association.

This Standard shall be under the jurisdiction of China National Steel Standardization Technical Committee (SAC/TC 183).

Main drafting organizations of this Standard: Gansu Jiuquan Steel Group Hongxing Iron and Steel Co., Metallurgical Industry Information Standards Institute, Tangshan Iron and Steel Group Co., Ltd., CAPITAL IRON & STEEL CORP., Shaanxi Automobile Group Co., Ltd., Xinyu Iron and Steel Co., Magang (Group) Holding Co., Ltd.

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Versions of standard substituted by this Standard are:

- GB 3278-1982, GB 3273-1989, GB/T 3273-2005.

Hot-rolled steel plates and strips for automobile frames

1 Scope

This Standard specifies designations, classifications and codes, order content, size, shape, weight and tolerance, technical requirements, test methods, inspection rules, packaging, marks and quality certificate of hot-rolled steel plates and strips for automobile frames.

This Standard is applicable to hot-rolled steel plates and strips of which the thickness is 1.6 mm ~ 16.0 mm for making automobile frames (hereinafter referred to as steel plates and strips).

2 Normative references

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

GB/T 222 *Permissible Tolerances for Chemical Composition of Steel Products*

GB/T 223.3 *Methods for chemical analysis of iron, steel and alloy - The diantipyrylmethane phosphomolybdate gravimetric method for the determination of phosphorus content*

GB/T 223.5 *Methods for chemical analysis of iron, steel and alloy - The reduced molybdosilicate spectrophotometric method for the determination of acid-soluble silicon content*

GB/T 223.6 *Methods for chemical analysis of iron, steel and alloy - The neutralization titrimetric method for the determination of boron content*

GB/T 223.11 *Iron, Steel and Alloy - Determination of Chromium Content - Visual Titration or Potentiometric Titration Method*

GB/T 223.12 *Methods for Chemical Analysis of Iron, Steel and Alloy - The Sodium Carbonate Separation - Diphenyl Carbazide Photometric Method for the Determination of Chromium Content*

GB/T 223.13 *Methods for chemical analysis of iron, steel and alloy - The ammonium ferrous sulfate titration method for the determination of vanadium content*

GB/T 223.14 *Methods for Chemical Analysis of Iron, Steel and Alloy - The N-Benzoyl-N-Phenylhydroxylamine Extraction Photometric Method for the Determination of Vanadium Content*

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 223.18 *Methods for Chemical Analysis of Iron, Steel and Alloy - The Sodium Thiosulfate Separation Iodimetric Method for the Determination of Copper Content*

GB/T 223.19 *Methods for chemical analysis of iron, steel and alloy - The neocuproine-chloroform extraction photometric method for the determination of copper content*

GB/T 223.23 *Iron, Steel and Alloy - Determination of Nickel Content - The Dimethylglyoxime Spectrophotometric Method*

GB/T 223.26 *Iron, Steel and Alloy - Determination of Molybdenum Content - The Thiocyanate Spectrophotometric Method*

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

GB/T 223.49 *Methods for chemical analysis of iron, steel and alloy Extraction separation-chlorophosphonazo mA spectrophotometric method for the determination of the total rare earth content*

GB/T 223.53 *Methods for chemical analysis of iron, steel and alloy - The flame atomic absorption spectrophotometric method for the determination of copper content*

GB/T 223.54 *Methods for chemical analysis of iron, steel and alloy - The flame atomic absorption spectrophotometric method for the determination of nickel content*

GB/T 223.58 *Methods for chemical analysis of iron, steel and alloy - The extraction-absorption catalytic polarographic method for the determination of manganese content*

ray fluorescence spectrometry(Routine method)

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 223.86 *Steel and iron - Determination of total carbon content - Infrared absorption method after combustion in an induction furnace*

GB/T 228.1 *Metallic materials - Tensile testing - Part 1 : Method of test at room temperature*

GB/T 229 *Metallic Materials - Charpy Pendulum Impact Test Method*

GB/T 232 *Metallic materials - Bend test*

GB/T 247 *General Provisions on packaging, marks and quality certificate of steel sheets and strips*

GB/T 709 *Size, shape, weight and tolerance of hot-rolled steel sheets and strips*

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

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

GB/T 6394 *Metal-methods for estimating the average grain size*

GB/T 8170 *Rules of rounding off for numerical values & expression and judgement of limiting values*

GB/T 13298 *Inspection methods of microstructure for metals*

GB/T 13299 *Steel - Determination of microstructure*

GB/T 17505 *Steel and Steel Products - General Technical Delivery Requirements*

GB/T 20066 *Steel and Iron-Sampling and Preparation of Samples for the Determination of Chemical Composition*

GB/T 20123 *Steel and iron - Determination of total carbon and sulfur content Infrared absorption method after combustion in an induction furnace (routine method)*

- b) product name;
- c) designation;
- d) surface treatment method and surface quality grade;
- e) delivery weight (or quantity);
- f) dimensions;
- g) delivery state;
- h) edge state;
- i) thickness precision;
- j) special requirements (see Clause 7).

4.2 Matters omitted in 4.1:

- a) when surface treatment method is not indicated, it shall be delivered in rolling surface;
- b) for hot-rolled steel plates and strips delivered in rolling surface, when thickness precision is not indicated, it shall be delivered in general precision; when edge state is not indicated, steel strips shall be delivered in edge maintained state while steel plates shall be in edge cutting state;
- c) for hot-rolled steel plates and strips delivered in pickling surface, when thickness precision, edge state, surface quality grade and if it is oiled, they shall be delivered in high thickness precision, edge state, general surface quality grade and oiled state.

5 Size, shape, weight and tolerance

The size, shape, weight and tolerance of steel plates and strips shall comply with the provisions of GB/T 709. If there are special requirements, it shall be determined by the supplier and the buyer through negotiation and indicated in the contract.

6 Technical requirements

6.1 Steel designations and chemical compositions

6.1.1 Steel designations and chemical compositions (melting analysis) shall comply with the provisions in Table 1. The comparison with similar foreign brands is shown in Annex A.

plates and strips of which the thickness is greater than 8.0 mm shall be grade 7 or finer. The adjacent grade must not exceed 3 levels. If the supplier can guarantee, the analysis can be exempted.

6.4.2 The banded structure of steel plates and strips is usually not greater than 2 grades. The banded structure is allowed to exceed 2 grades but not 3.

6.5 Surface quality

6.5.1 There must not be cracks, bubbles, inclusions, scarring, collapsed and visible scratches on the surface of steel plates and strips. Steel plates and strips must not have any delamination. If the surface has the aforementioned defects, cleaning is permitted. The cleaning depth must not exceed the half of plate thickness tolerance. Other defects are allowed to exist. But its depth or height must not exceed the half of plate and strip thickness tolerance. It shall also ensure the minimum thickness of steel plates and strips.

6.5.2 During the continuous production of steel strips, partial surface defects are difficult to find and remove; therefore, they are allowed to have defects. But the part with defects must not exceed 8% of the total length of each roll of steel strips.

6.5.3 The surface quality grade and characteristics of steel plates and strips shall comply with the provisions of Table 3.

Table 3 The surface quality grade and characteristics of steel plates and strips

Grade and code	Suitable surface treatment method	Characteristics
Ordinary grade surface (FA)	Rolling surface (SR) Pickling surface (SA)	Slight, partial defects like pitting, concaves, scratches of which the depth (or height) does not exceed half of strip thickness tolerance are allow to exist on the surface. But it shall ensure the allowable minimum thickness of steel plates and strips. Partial defects like slight jagged edges, partially uncut edge, under pickling, over pickling, parking spot are allowed to exist.
High grade surface (FB)	Pickling surface (SA)	Partial defects which do not affect moldability are allow to exist on the surface, such as slight scratches, slight indentation, slight pitting, slight roll printing and color difference, etc.. The surface is allow to have inconspicuous minor parking spots after oiling. Defects

performed according to the provisions of GB/T 8170.

9 Inspection rules

9.1 Steel plates and strips inspection shall be carried out by the quality inspection department of the supplier.

9.2 Steel plates and strips shall be accepted in batch. Each batch shall consist of steel plates or strips of same designation, same furnace number, same rolling rule, same thickness, same delivery state.

9.3 Re-inspection and determination of other inspection items shall comply with the provisions of GB/T 17505.

9.4 Mechanical properties and chemical composition test results shall use rounding value comparison method to round. The rounding rules shall be performed according to the provisions of GB/T 8170.

10 Packaging, marks and quality certificate

The packaging, marks and quality certificate of steel plates and strips shall comply with the provisions of GB/T 247.

Annex A

(Informative)

Comparison between designations of this Standard and similar foreign designations

The comparison between designations of this Standard and similar foreign designations is shown in Table A.1.

Table A.1 Comparison between designations of this Standard and similar foreign designations

GB/T 3273-2015	EN 10149-2:1995
370L	S315MC
420L	S355MC
440L	S420MC
510L	S460MC
550L	S500MC
600L	S550MC
650L	S600MC
700L	S650MC
750L	S700MC
800L	--

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