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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 20887.1-2017

Replacing GB/T 20887.1-2007

Continuously hot-rolled high strength steel sheet and strip for automobiles - Part 1: High yield strength steel for cold forming

汽车用高强度热连轧钢板及钢带 第1部分：冷成形用高屈服强度钢

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Foreword

GB/T 20887 Continuously Hot Rolled High Strength Steel Sheet and Strip for Automobile can be divided into 7 parts.

1.High Yield Strength Steel for Cold Forming;

2.High Hole Expansion Steel;

3.Dual Phase Steel;

4.Transformation Induced Plasticity Steel;

5.Martensitic Steel;

6.Complex Phase Steel;

7.Steels for Hydraulic Forming. This Part belongs to Part 1 of GB/T 20887. This Part was drafted as per the rules specified in GB/T 1.1-2009. This Part Replaced GB/T 20887.1-2007 Continuously Hot Rolled High Strength Steel Sheet and Strip for Automobile - Part

1.High Yield Strength Steel for Cold Forming. Compared with GB/T 20887.1-2007, this Part has the major technical changes as follows:

--- Increase two grades of HR900F, HR960F; and their corresponding technical requirements (see Table 1, Table 2 of this Edition);

--- Delete the provisions of residual elements (see

6.1.1 of Edition 2007);

--- Modify batch weight from 40t to 60t (see

8.2 of this Edition;

1 Scope

China's national standard for hot-rolled high yield strength steel sheet for cold forming in automotive use. It is Part 1 of GB/T 20887 and specifies the classification and grade designation, the order content, the dimensions, appearance and weight, the technical requirements, the test methods, the inspection rules, and the packaging, marking and quality certificate. The hot-rolled series exists alongside the cold-rolled series of GB/T 20564 because the two products go to different parts of the vehicle. Cold-rolled sheet is thin, has a good surface and is used where appearance or deep drawing matters. Hot-rolled sheet is thicker, cheaper per tonne, and is used where neither does: the chassis, the suspension arms, the wheels, the frame members and the seat structure. Those parts are cold formed - bent, roll-formed, stamped from thicker gauge - and what they need is a high yield strength, because a part that is bent rather than drawn is designed against yield and springs back in proportion to it. This part covers the microalloyed high yield strength grades, in which small additions of niobium, titanium or vanadium precipitate carbonitrides that refine the grain and strengthen the steel without raising carbon, so weldability and formability are preserved. That combination is what makes them usable: strength that arrives from grain refinement costs nothing in toughness, unlike strength from carbon. The standard sets the yield and tensile strength grades, the elongation, the bending performance, the composition limits and the carbon equivalent, together with the thickness and shape tolerances and the surface classes. Issued on 7 September 2017 and in force since 1 June 2018, it replaces GB/T 20887.1-2007.

This Part of GB/T 20887 specifies the classification and grade expression method, ordering contents, dimension, appearance, weight, technical requirements, test methods, inspection rules, package, mark and quality certificate of hot rolled high yield strength steel sheet and strip for cold forming. This Part is applicable to continuously hot rolled high yield strength steel strip for cold forming, and transversely-cut steel sheet and longitudinally-cut steel strip (hereinafter referred to as "steel sheet and strip") made by the above steel strip.

2 Normative References

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for

the undated documents, only the latest version (including all the amendments) are applicable to this document.

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

GB/T 223.5 Steel and Iron - Determination of Acid-Soluble Silicon and Total Silicon Content - Reduced Molybdosilicate Spectrophotometric Method

GB/T 223.9 Iron Steel and Alloy - Determination of Aluminum Content - Chrom Azurol S Photometric Method

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 223.26 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 223.58 Methods for Chemical Analysis of Iron, Steel and Alloy - The Extraction-Absorption Catalytic Polarographic Method for the Determination of Manganese Content

3.1 Classification

3.2 Grade expression method The grade of steel sheet and strip consists of three parts like initial of "Hot Rolled" of "HR", specified minimum yield strength value, initial of "Forming" of "F". Example. HR315F

4 Ordering Contents

4.1 The contract or purchasing list ordering products as per this Part shall include the following contents.

4.2 If the ordering contact doesn't specify the surface state, thickness accuracy, etc.; then the products shall be supplied as per hot rolled surface, ordinary thickness accuracy.

5 Dimension, Appearance, Weight

The dimension, appearance, weight and permissible tolerance of steel sheet and strip shall conform to the provisions of GB/T 709.

6.1 Grade and chemical compositions

6.2 Smelting method The steel used for steel sheet and strip shall be smelted by oxygen converter or electric furnace; unless otherwise specified, the smelting method shall be

selected by the supplier.

6.3 Delivery state

6.3.1 Generally, the steel sheet and strip shall be delivered in hot rolled state.

6.5 Surface quality

6.5.1 The surface of steel sheet and strip shall be free of defects that are harmful to use, such as scars, cracks, inclusions, etc.; steel sheet and strip shall have no delamination.

6.5.2 The surface quality of steel sheet and strip shall conform to the provisions of Grade

6.6 Special requirements According to the requirements of the purchaser, through the negotiation between the supplier and the purchaser, indicated in the contract, the Charpy (V-notch) impact test, grain size and non-metallic inclusion inspection can be supplemented.

7 Test Methods

7.1 The analysis method for the chemical compositions of steel shall be performed as per the provisions of GB/T 223.5, GB/T 223.9, GB/T 223.17, GB/T 223.26, GB/T 223.40, GB/T 223.58, GB/T 223.59, GB/T 223.67, GB/T 223.76, GB/T 223.78, GB/T 223.86, GB/T 4336, GB/T 20123, GB/T 20125, GB/T 20126 or general method; while the arbitration shall be performed as per the provisions of GB/T 223.5, GB/T 223.9, GB/T 223.17, GB/T 223.26, GB/T 223.40, GB/T 223.58, GB/T 223.59, GB/T 223.67, GB/T 223.76, GB/T 223.78, GB/T 223.86.

7.2 The inspection items and test methods of steel sheet and strip shall conform to the provisions of Table 4.

8 Inspection Rules

8.1 The inspection and acceptance of steel sheet and strip shall be performed by the supplier's Inspection department.

8.2 The steel sheet and strip shall be accepted in batches. Each batch consists of the steel sheet and strip with the same grade, the same furnace number, the same thickness, and the same rolling mechanism.

8.3 The sampling quantities and sampling methods of steel sheet and strip shall conform to the provisions of Table 4.

8.4 The reinspection and judgement rules of steel sheet and strip shall conform to the provisions of GB/T 17505.