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

GB/T 20564.8-2015

**Continuously cold-rolled high strength steel sheet and strip for
automobiles - Part 8: Complex phase steel**

汽车用高强度冷连轧钢板及钢带 第8部分：复相钢

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Foreword

GB/T 20564 Continuously Cold Rolled High Strength Steel Sheet and Strip for Automobile is divided into 8 parts.

--- Part 1. Bake Hardening Steel;

--- Part 2. Duplex Steel;

--- Part 3. Interstitial-Free Steel;

--- Part 4. Low-Alloy High-Strength Steel;

--- Part 5. Isotropic steel;

--- Part 6. Transformation Induced Plasticity Steel;

--- Part 7. Martensitic steel;

--- Part 8. Complex Phase Steel. This Part is Part 8 of GB/T 20564. This Part was drafted as per the rules stated in GB/T 1.1-2009. This Part was proposed by China Iron and Steel Association. This Part shall be under the jurisdiction of National Technical Committee for Standardization of Steel (SAC/TC 183). Drafting organizations of this Part. Shougang Company Limited, and China Metallurgical Information and Standardization Institute. Chief drafting staffs of this Part. Tang Mu, Kuang Shuang, Zhang Weixu, Shi Li, and Yao Shun.

Continuously Cold Rolled High Strength Steel Sheet and Strip for Automobile - Part 8. Complex Phase Steel

1 Scope

China's national standard for complex phase steel sheet for automotive use. It is Part 8 of GB/T 20564 and specifies the terms and definitions, the classification and code, the dimensions, appearance and weight, the technical requirements, the inspection and testing, and the packaging, labelling and quality certificate of cold-rolled complex phase steel sheet and strip. Complex phase steel is what a body engineer specifies when dual phase steel is not the right answer at the same strength. Both reach high tensile strength, but they do so with different microstructures and they behave differently in the part rather than in the tensile test. Dual phase steel has a low yield ratio and a very high work hardening rate, which is what makes it draw well; complex phase steel has a fine microstructure of ferrite and bainite with small amounts of martensite and retained austenite, strengthened by precipitation and grain refinement, giving a much higher yield strength for the same tensile strength. That matters for three things a drawing steel is poor at. It gives higher energy absorption in a crash, because the part resists from the first millimetre of deformation rather than after work hardening. It gives far better hole expansion and stretch flangeability, so an edge that has been punched or trimmed can be flanged without splitting - the characteristic failure of high strength parts made from dual phase steel. And it bends better. So complex phase steel goes into chassis parts, suspension components, bumper beams and reinforcements: parts that are roll-formed or bent, that carry punched holes, and whose job is to resist rather than to be shaped. The standard sets the strength grades and the mechanical requirements accordingly, together with the composition, the dimensional tolerances and the surface classes. Issued on 10 December 2015 and in force since 1 November 2016.

This Part of GB/T 20564 specifies the terms and conditions, classification and code, dimension, appearance, weight, technical requirement, inspection and test, package, label and quality certificate, and etc. of continuously cold rolled high strength steel sheet and strip (hereinafter referred to as steel sheet and strip). This Part specified steel sheet and steel strip are mainly used for manufacturing automotive construction parts, strengthening parts, and partial internal and external plates; the thickness of steel sheet and steel strip is 0.60mm~2.50mm.

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 standard.

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

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

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

GB/T 223.53 Method for Chemical Analysis of Iron, Steel and Alloy - The Flame Atomic Absorption Spectrophotometric Method for the Determination of Copper 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 223.60 Methods for Chemical Analysis of Iron, Steel and Alloy - the Perchloric Acid Dehydration Gravimetric Method for the Determination of Silicon Content

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 Iron, Steel and Alloy - Determination of Manganese Content - Flame Atomic Absorption Spectrometric Method

GB/T 223.67 Iron, Steel and Alloy - Determination of Sulfur Content - Methylene Blue Spectrophotometric Method

GB/T 223.68 Methods for Chemical Analysis of Iron, Steel and Alloy - The Potassium Iodate Titration Method after Combustion in the Pipe Furnace for the Determination of Sulfur Content

GB/T 223.69 Iron, Steel and Alloy-Determination of Carbon Contents - Gas-volumetric Method after Combustion in the Pipe Furnace

3 Terms and Definitions

The following terms and definitions are applicable to this document.

3.1 Complex phase steel, CP Steel's microstructure indicates ferrite or Bainite matrix distributed with small amount of Martensite, retained austenite or pearlite. Through micro-alloying element, conduct fine grain strengthening or precipitation strengthening, Compared with the duplex steel with the same tensile strength, it has higher yield strength

and better bending performance.

4 Classification and Code

4.1 Designation naming method The designation of steel sheet and steel strip consists of the initial letters of Cold Rolled - "CR"; specified minimum yield strength/ tensile strength; and initial letters of Complex Phase - "CP". E.g.. CR500/780CP.

6 Dimension, Appearance, Weight and Allowable

Tolerance The dimension, appearance, weight and allowable tolerance of steel sheet and steel strip shall conform to the provisions of GB/T 708.

7 Technical Requirements

7.1 Chemical composition Steel's chemical composition (melting analysis) reference can refer to Appendix A. If the buyer has any requirements for the chemical composition, it shall be coordinated during the ordering period.

7.2 Melting method Steel sheet and steel strip used steel is melted in oxygen converter or electric furnace; unless otherwise is specified, the melting mode shall be selected by the supplier.

7.3 Delivery state

7.3.1 Steel sheet and steel strip shall be delivered in the flat state after annealing.

7.3.2 Generally, steel sheet and steel strip shall be delivered in coating mode; the coating film can be removed by the alkali solution or ordinary solution; under the common packing, transporting, loading and unloading, and storing conditions, supplier shall guarantee, within 6 months since the date of manufacture, the surface of steel sheet and steel strip generates no rust. If the buyer demands the product shall be delivered without coating, then it shall be coordinated in the ordering period. NOTE. As for the product that the buyer demands no coating, it may generate rust, or its surface may be slightly scratched during the transporting, loading and unloading, storing and using period.

7.4 Mechanical properties Mechanical properties of steel sheet and steel strip shall conform to the provisions of Table 3.

10 Rounding off of Numeric Values

This Part conducts rounding by rounding value comparison method; the rounding rules shall conform to the provisions of GB/T 8170.