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

GB/T 20887.7-2017

**Continuously hot-rolled high strength steel sheet and strip for
automobiles - Part 7: Steels for hydraulic forming**

汽车用高强度热连轧钢板及钢带 第7部分：液压成形用钢

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Foreword

GB/T 20887, Continuously hot rolled high strength steel sheet and strip for automobile, comprises 7 parts. -- Part 1. High yield strength steel for cold forming; -- Part 2. High hole expansion steel; -- Part 3. Dual phase steel; -- Part 4. Transformation induced plasticity steel; -- Part 5. Martensitic steel; -- Part 6. Complex phase steel; -- Part 7. Steels for hydraulic forming. This Part is Part 7 of GB/T 20887. This Part was drafted in accordance with the rules given 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 on Steels of Standardization Administration of China (SAC/TC 183). The drafting organizations of this Part. Ansteel Co., Ltd., Shougang Group, China Metallurgical Information and Standardization Institute. The main drafters of this Part. Lv Dong, Guan Jichun, Wu Zhaohui, Zhang Weixu, Liu Rendong, Shi Li, Li Qian. Continuously hot rolled high strength steel sheet and strip for automobile - Part 7. Steels for hydraulic forming

1 Scope

China's national standard for hot-rolled steel sheet and strip intended for hydroforming. It is Part 7 of GB/T 20887 and specifies the terms and definitions, the classification and designation, the order content, the dimensions, shape and weight, the technical requirements, the test methods, the inspection rules, and the packaging, marking and quality certification. Hydroforming makes a closed structural section from a tube by pressurising it inside a die: the tube is placed in the tool, the ends are sealed and fed

inward while fluid pressure expands the wall outward against the die surface. It produces parts that stamping cannot - a continuous closed section with varying cross-shape along its length, made in one piece with no flanges and no seam weld to fail - and it is how engine cradles, roof rails, instrument panel beams and many chassis members are now made. But the steel has to survive a very particular loading. The material is expanded biaxially, thinning as it goes, over a large strain path that ends at the corners of the die where the expansion is greatest, and it must reach the corner without bursting and without wrinkling where it is being fed. That demands a combination different from ordinary formability: a high uniform elongation, a high work hardening exponent to distribute the strain rather than let it localise, a low yield ratio, and above all consistency, since a hydroforming line runs to a pressure and feed schedule that was developed for a particular material behaviour and does not tolerate a coil that behaves differently. The standard therefore specifies these properties as requirements, along with the weldability the tube seam needs and tight dimensional and surface control. Issued on 7 September 2017 and in force since 1 June 2018.

This Part of GB/T 20887 specifies the terms and definitions, classification and designation, ordering content, dimensions, shapes, weights, technical requirements, test methods, inspection rules, packaging, marking and quality certification of continuously hot rolled high strength steel sheet and strip. This Part applies to steel strip of thickness not greater than 6 mm, and steel sheet transversely cut or steel strip longitudinally cut from steel strip, which are used for the structural parts of automobile such as auxiliary frames and dashboard supports (hereinafter referred to as "steel sheet and strip").

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 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 molybdsilicate spectrophotometric method

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 titaninm content

GB/T 223.40, Iron, steel and alloy - Determination of niobium content by the sulphochlorophenol S spectrophotometric method

GB/T 223.62, Methods for chemical analysis of iron, steel and alloy - The butyl acetate extraction photometric method for the determination of phosphorus content

GB/T 223.64, Iron, steel and alloy - Determination of manganese content - Flame atomic absorption spectrometric method

GB/T 223.76, Methods for chemical analysis of iron, steel and alloy - The flame atomic absorption spectrometric method for the determination of vanadium content

GB/T 223.79, Iron and steel - Determination of multi-element contents - X-ray fluorescence spectrometry(Routine 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 247, General rule of package, mark and certification for steel plates (sheets) and strips

5 Ordering content

5.1 The contract or order based on this Part shall include the following content.

- a) product name (steel sheet or strip);
- b) a reference to this Part;
- d) specifications, dimensions and roughness accuracy;
- e) surface quality level;
- f) surface condition (when it is an acid pickled surface, it is represented by "P");
- g) edge condition;
- h) oil coated or not;
- i) control method when used for control (such as electric resistance welding ERW and laser welding LBW);
- k) other special requirements.

5.2 If it is not stated in the purchase contract, including thickness accuracy, surface quality level, edge condition and whether oil is coated or not, then the products of this Part are supplied in accordance with the normal thickness accuracy, common level surface (FA), trimmed condition and oil coated condition.

6 Dimensions, shapes and weights

The dimensions, shapes and weights and tolerances for steel sheet and strip shall be as specified in GB/T 709.

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