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Seamless steel tubes for automobile stabilizer bar

汽车稳定杆用无缝钢管

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard was proposed by China Iron and Steel Industry Association.

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

The drafting organizations of this standard: Jiangsu Huacheng Industrial Tube Co., Ltd., Jiangsu Dioumu Co., Ltd., Shanghai China Spring Manufacturing Co., Ltd., Zhejiang Jinsheng Auto Parts Co., Ltd., Metallurgical Industry Information Standards Institute.

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Seamless steel tubes for automobile stabilizer bar

1 Scope

This standard specifies the order content, size, shape, weight and tolerances, technical requirements, test methods, inspection rules, packaging, marking and quality certificates for seamless steel tubes for automotive stabilizer bars.

This standard applies to the old drawn or cold rolled seamless steel tubes used to manufacture automotive stabilizer bar (hereinafter referred to as steel tube).

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 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 - Chrome azurol S photometric 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 223.14 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 223.23 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 223.53 Methods for chemical analysis of iron, steel and alloy - The flame atomic absorption spectrophotometric method for the determination of copper content

GB/T 5777-2008 Seamless steel pipe and tubing methods for ultrasonic testing

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

GB/T 7735-2016 Automated eddy current testing of seamless and welded (except submerged arc-welded) steel tubes for detection of imperfections

GB/T 10561-2005 Steel - Determination of content of nonmetallic inclusions - Micrographic method using standards diagrams

GB/T 12606-2016 Automated full peripheral flux leakage testing of seamless and welded (except submerged arc-welded) ferromagnetic steel tubes for the detection of longitudinal and/or transverse imperfections

GB/T 13298 Inspection methods of microstructure for metals

GB/T 17395 Dimensions, shapes, masses and tolerances of seamless steel tubes

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)

3 Order content

The contract or order for ordering steel tubes in accordance with this standard shall include the following:

- a) Standard number;
- b) Product name;
- c) Designation;
- d) Size specifications;
- e) Order quantity (total weight or total length);
- f) Delivery status;
- g) Manufacturing method;

5.1.2 Chemical composition (melting analysis) for designations 20Mn2B and 25MnCrAlTiB shall comply with the requirements in Table 4.

Table 4 -- Steel chemical composition

Designation	Chemical composition (mass fraction) ^{a, b} /%								
	C	Si	Mn	Al	Cr	Ti	B	P	S
20Mn2B	0.17~0.24	0.17~0.37	1.50~1.80	—	—	—	0.000 8~0.003 5	≤0.025	≤0.010
25MnCrAlTiB	0.22~0.28	0.10~0.40	1.10~1.50	0.015~0.080	0.10~0.30	0.02~0.05	0.001 0~0.005 0	≤0.025	≤0.010

^a The residual element content in steel shall comply with the following requirements: Cu ≤ 0.20%, Cr ≤ 0.30%, Ni ≤ 0.30%, Mo ≤ 0.30%.
^b The residual tungsten, vanadium, and titanium content in steel shall be analysed, AND the results shall be recorded in the quality certificates. As required by the purchaser, it may limit the content of the residual tungsten, vanadium, and titanium.

5.1.3 The allowable deviation of chemical composition of the finished steel tube shall be in accordance with the provisions of GB/T 222.

5.1.4 In accordance with the requirements of the purchaser, as negotiated between the supplier and the purchaser, AND indicated in the contract, it may supply the steel tubes of other designations.

5.2 Manufacturing methods

5.2.1 Smelting method of steel

Steel shall be used be subjected to arc furnace plus external furnace refining, OR oxygen converter plus external furnace refining method for smelting. As negotiated between the supplier and the purchaser, steel may also be smelted by other methods of higher requirements. When the purchaser indicates using a certain smelting method, it shall be noted in the contract.

5.2.2 Manufacturing method of billet

The tube billet shall be manufactured by continuous casting plus hot rolling (forging) methods OR other higher quality requirements approved by both the supplier and the purchaser.

5.2.3 Manufacturing method of steel tube

The steel tube shall be made by cold drawing or cold rolling seamless method. When specifying a manufacturing method, it shall be indicated in the contract.

5.3 Delivery status

The steel tube shall be delivered in an annealed state. As required by the purchaser AND negotiated between the supplier and the purchaser, the steel

separation. These defects shall be completely removed, the removal depth shall not exceed the negative deviation of the nominal wall thickness, AND the actual wall thickness at the removal portion shall be not less than the minimum allowable wall thickness.

5.11 Special requirements

5.11.1 Flattening

In accordance with the requirements of the purchaser, as negotiated between the supplier and the purchaser, AND indicated in the contract, the steel tube having a wall thickness to outer diameter ratio of less than 10% may be subjected to flattening test, AND the distance H between the plates after flattening the sample is calculated in accordance with the formula (1):

$$H = \frac{(1 + \alpha)S}{\alpha + S/D} \dots\dots\dots(1)$$

Where:

H - The distance between two plates, in millimeters (mm);

S - The nominal wall thickness of steel tube, in millimeters (mm);

D - The nominal outer diameter of steel tube, in millimeters (mm);

α - The unit length deformation coefficient, which is taken as 0.08.

After the flattening test, the samples shall be free from cracks or fractures.

5.11.2 Bending

In accordance with the requirements of the purchaser, as negotiated between the supplier and the purchaser, AND indicated in the contract, the steel tube of outer diameter not more than 22 mm may be subjected to bending test, the bending angle is 90°, the bending radius is 2 times the outer diameter of steel tube, AND the bending part of the sample after bending shall be free from cracks.

6 Test method

6.1 Instrument analysis of chemical composition of steel tube shall comply with the provisions of GB/T 4336 and GB/T 20123, wet analysis shall comply with the provisions of GB/T 223.5, GB/T 223.9, GB/T 223.12, GB/T 223.14, GB/T