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NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA

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GB/T 4697-2017

Replacing GB/T 4697-2008

Hot rolled steel section for mine timbering

矿山巷道支护用热轧型钢

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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 4697-2008, *Hot-rolled U-type steel for mine timbering*. Compared with GB/T 4697-2008, the major technical changes are as follows:

- it changes the name of the standard;
- it adds hot rolled I section for mine;
- it adds the new designation of hot rolled I section for mine;
- it adjusts some sectional dimensions of 25UY;
- it tightens the specifications for deflection;
- it adjusts the composition and performance indexes of hot rolled I section;
- it adds the method for determination of dimensions and shape of hot rolled section.

This Standard was proposed by China Iron and Steel Association

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

The drafting organizations of this Part: HBIS Group Tangshan Steel Company, Hebei Yongyang Special-Steel Group Co., Ltd., China Metallurgical Information and Standardization Institute.

The main drafters of this Part: Deng Cuiqing, Han Xiaoli, Fan Lijuan, Wang Yujie, Du Xiaobo, Liu Baoshi, Xu Feng.

The previous editions of the standard replaced by this Standard are as follows:

- GB/T 4697-1984, GB/T 4697-1991, GB/T 4697-2008.

Hot rolled steel section for mine timbering

1 Scope

This Standard specifies the ordering content, dimensions, shape, weight and tolerances, technical requirements, test methods, inspection rules, packaging, marking and certification of hot rolled U- and I-type steel section for mine timbering.

This Standard applies to hot rolled U- and I-type steel section for mine timbering (hereinafter referred to as steel section).

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 223.11, *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 223.14, *Methods for chemical analysis of iron, steel and alloy – The n-benzoy-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 223.36, *Methods for chemical analysis of iron, steel and alloy – The neutral titration method for the determination of nitrogen content after distillation separation*

GB/T 223.37, *Methods for chemical analysis of iron, steel and alloy – The indophenol blue photometric method for the determination of nitrogen content after distillation separation*

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 223.59, *Iron, steel and alloy – Determination of phosphorus content – Bismuth phosphomolybdate blue spectrophotometric method and antimony phosphomolybdate blue spectrophotometric method*

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 223.68, *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*

GB/T 223.72, *Iron, steel and alloy – Determination of sulfur content – Gravimetric method*

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 2101-2008, *General requirement of acceptance, packaging, marking and certification for section steel*

GB/T 2975, *Steel and steel products – Location and preparation of samples and test pieces for mechanical testing*

GB/T 4336, *Carbon and low-alloy steel – Determination of multi-element contents – Spark discharge atomic emission spectrometric method (routine method)*

GB/T 20066, *Steel and iron – Sampling and preparation of samples for the*

guarantee it, analysis can be omitted. If there is a sufficient quantity of nitrogen binding elements in steel, such as Al, Nb, V, Ti and so on, nitrogen content is not limited.

5.2.4 Aluminium content of U-type steel section (aluminium content can be replaced by elements, such as vanadium, whose content is not less than 0.010%) is not a condition for delivery, provided that impact absorbed energy is as specified in standards.

5.2.5 Tolerances of chemical composition of steel section shall be as specified in GB/T 222.

5.2.6 Steel section of other designations can be supplied, which shall be as agreed by the interested parties and stated in contracts.

5.3 Delivery condition

Steel section is delivered in the condition of hot rolling.

5.4 Mechanical properties and processing properties

5.4.1 Mechanical properties and processing properties of steel section shall be as specified in Table 7.

5.4.2 Impact absorbed energy is the arithmetic mean value of the single values of a group of 3 samples. The single value of a sample is allowed to be lower than the specified value, but it shall not be lower than 70% of the specified value.

5.5 Surface quality

5.5.1 Ends of steel section shall be free from layers and shrinkage residues; height of end burrs shall not be greater than 5 mm.

5.5.2 Surface of steel section shall be free from cracks, folds, scars, layers and inclusions; surface of steel section allows the defects, including pits, scratches and iron oxide indentations with a thickness not exceeding 0.6 mm, and bulges with a thickness less than 1.0 mm, but they shall not exceed the dimensional tolerances of steel section.

5.5.3 Unallowed defects on surface of steel section are allowed to be removed, but shall not be removed laterally. Removing spots shall be smooth without sharp edges; removing width shall not be less than 5 times of removing depth. Removing depth is calculated from actual dimensions, but shall not exceed the negative tolerances of steel section.

5.5.4 Surface defects of steel section shall not be repaired by welding or filling.

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