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

GB/T 12773-2021

Valve steel and superalloy bars for internal combustion engines

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part 1. Structure and Drafting Rules of Standardization Documents"

Drafting.

This document replaces GB/T 12773-2008 "Steel and Alloy Bars for Internal Combustion Engine Valves", and compared with GB/T 12773-2008, except for

In addition to structural adjustments and editorial changes, the main technical changes are as follows.

- a) The normative references have been changed (see Chapter 2, Chapter 2 of the.2008 edition);
- b) The short rule requirements have been changed (see 6.1.5, 5.1.5 of the.2008 edition);
- c) The size range is changed (see 6.1, 5.1 of the.2008 edition);
- d) The grain size requirements have been changed (see 7.8, 6.8 in the.2008 edition);
- e) Changed the surface roughness $Ra \leq 1.6\mu m$ (see 7.11.3, 6.10.4 of the.2008 edition);
- f) Wire rods and corresponding technical requirements have been added (see 6.1.6, 6.2, 7.3, 7.4, 7.11.4, Chapter 8, Chapter 9, Chapter 10);
- g) The Ni content requirement of 85Cr18Mo2V has been added (see 7.1.1);
- h) Added the hardness requirements for delivery in quenched and tempered state (see 7.4);
- i) Added Ni30 grade and corresponding technical requirements (see 7.1.1, 7.4, 7.5);
- j) The requirement of DS for non-metallic inclusions has been added (see 7.9);
- k) Deleted the 86Cr18W2VRe brand (see Table 2 of the.2008 edition);
- l) The comparison table of steel and superalloy grades for internal combustion engine valves in various countries has been deleted (see Appendix B of the.2008 edition);
- m) Modified the technical differences between this document and ISO 683-15.1992 and the

reasons (see Appendix A, Appendix D and Appendix E).

This document uses the redrafting method to amend and adopt ISO 683-15:1992, Heat Treated Steel, Alloy Steel and Free-cutting Steel Part 15. Internal Combustion Steel for Machine Air Valves".

This document is technically related to ISO 683-15:1992 "Heat-treated steel, alloy steel and free-cutting steel Part 15. Steel for internal combustion engine valve"

Differences, Appendix A gives a list of corresponding technical differences and their reasons.

This document has made the following editorial changes.

---Adjusted the position of individual chapters in ISO.

1 Scope

This document specifies the definition and terminology, classification, order content, size, shape and weight, technical requirements,

Test methods, inspection rules, packaging, markings and quality certificates.

This document is applicable to hot-rolled and forged bars with a diameter not greater than 120mm and cold-rolled bars with a diameter not greater than 35mm for the manufacture of internal combustion engine gas valves.

Drawn steel, silver bright steel, alloy bars and wire rods.

2 Normative references

The contents of the following documents constitute the indispensable clauses of this document through normative references in the text. Among them, dated quotations

Only the version corresponding to that date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to

This document.

GB/T 222 The allowable deviation of the chemical composition of the finished steel

GB/T 223.8 Methods for chemical analysis of iron, steel and alloy. Sodium fluoride separation-EDTA titration method for the determination of aluminum content

GB/T 223.11 Determination of chromium content in iron, steel and alloy by visual titration or potentiometric titration (GB/T 223.11-2008,

ISO 4937:1986, MOD)

GB/T 223.13 Methods for chemical analysis of iron, steel and alloy. The ferrous ammonium sulfate titration method for the determination of vanadium content

GB/T 223.17 Methods for chemical analysis of iron, steel and alloy The dianthipyrene methane photometric method for the determination of titanium content

GB/T 223.19 Methods for chemical analysis of iron, steel and alloy, neocuproine-chloroform extraction spectrophotometric method for the determination of copper content

GB/T 223.22 Methods for chemical analysis of iron, steel and alloy-The nitroso R salt spectrophotometric method for the determination of cobalt content

GB/T 223.25 Methods for chemical analysis of iron, steel and alloy-The dimethylglyoxime gravimetric method for the determination of nickel content

GB/T 223.26 Steel and alloy determination of molybdenum content-Thiocyanate spectrophotometric method

GB/T 223.28 Methods for chemical analysis of iron, steel and alloy-The alpha-benzoin oxime gravimetric method for the determination of molybdenum content

GB/T 223.36 Methods for chemical analysis of iron, steel and alloy. Distillation separation-neutralization titration method for the determination of nitrogen content

GB/T 223.40 Steel and alloy determination of niobium content-Chlorosulfonol S spectrophotometric method

GB/T 223.43 Determination of tungsten content in iron, steel and alloy by gravimetric method and spectrophotometric method

GB/T 223.49 Methods for Chemical Analysis of Steel and Alloys Extraction Separation-Chlorophosphonazo mA Spectrophotometric Determination of Total Rare Earth

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 223.61 Methods for chemical analysis of iron, steel and alloy-The ammonium phosphomolybdate volumetric method for the determination of phosphorus content

GB/T 223.64 Determination of manganese content in steel and alloy by flame atomic absorption spectrometry (GB/T 223.64-2008,

ISO 10700.1994, IDT)

GB/T 223.67 Steel and alloy determination of sulfur content-Methylene blue spectrophotometric method (GB/T 223.67-2008,

ISO 10701.1994, IDT)

GB/T 223.69 Steel and alloy carbon content determination after combustion in tube furnace

gas volume method

GB/T 223.70 Iron, steel and alloys-Determination of iron content-Phenanthroline spectrophotometric method

GB/T 223.75 Steel and alloy determination of boron content methanol distillation-curcumin photometric method

GB/T 223.79 Determination of multi-element content of steel by X-ray fluorescence spectrometry (conventional method)

GB/T 223.85 Determination of Sulfur Content in Iron and Steel and Alloys by Infrared Absorption Method after Induction Furnace Combustion (GB/T 223.85-2009,