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

GB/T 15712-2016

**Micro-alloyed medium carbon steels
(English Translation)**

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Foreword

This Standard is drafted according to the rules given in GB/T 1.1-2009.

This Standard replaces GB/T 15712-2008 "Microalloyed medium carbon steel".

Compared with GB/T 15712-2008, the main changes are as follows.

- ADD the classification of steel according to microstructure;
- ADD six steel grades. F70VS, F38MnSiNS, F48MnV, F37MnSiVS, F41MnSiV, F25Mn2CrVS and relevant requirements;
- ADJUST the silicon content of parts of steel grades. the silicon content of F35VS, F40VS and F45VS is adjusted from 0.20% ~ 0.40% to 0.15% ~ 0.35%; the silicon content of F30MnVS and F38MnVS is adjusted from $\leq 0.80\%$ to 0.30% ~ 0.80%.
- ADJUST the carbon content range of F38MnVS, from 0.34% ~ 0.41% to 0.35% ~ 0.42%;
- ADD the requirement of $\text{Mo} \leq 0.05\%$;
- CANCEL the residual elements Ni, Cu, Mo, Nb, Ti finished products' chemical composition allowable deviation;
- ADD recommended calculation formula for carbon equivalent;

- TIGHTEN the requirements for low magnification;
- TIGHTEN the requirements for decarburization layer;
- ADD the grain size as a protocol requirement;
- ADD the requirement that the surface quality may be in accordance with the requirements of GB/T 28300;
- ADD the requirement that it may provide inspection documents according to GB/T 18253.

This Standard uses the redrafting method to amend and adopt ISO 11692.1994 "Ferritic-pearlitic engineering steel for precipitation hardening from hot-working temperatures".

In order to facilitate comparison, the comparison table of the clause and article number in this Standard and the clause and article number in ISO 11692.1994 is listed in Annex A of this Standard.

Microalloyed medium carbon steel

1 Scope

This Standard specifies the terms and definitions, classification, order content, dimension, shape and allowable deviation, technical requirements, test methods, inspection rules, packaging, marking and quality certificate of microalloyed medium carbon steel.

This Standard applies to hot-rolled steel and bright steel (hereinafter referred to as steel) of microalloyed medium carbon steel.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only the dated edition applies to this document. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 223.5 Steel and iron - Determination of acid-soluble silicon and total silicon content - Reduced molybdosilicate spectrophotometric method (GB/T 223.5-2008, ISO 4829-1.1986, ISO 4829-2.1988, MOD)

GB/T 223.11 Iron steel and alloy - Determination of chromium content - Visual titration or potentiometric titration method (GB/T 223.11-2008, ISO 4937.1986, MOD)

GB/T 223.16 Methods for chemical analysis of iron, steel and alloy - The chromotropic acid photometric method for the determination of titanium content

GB/T 223.18 Methods for chemical analysis of iron, steel and alloy - The sodium thiosulfate separation iodimetric method for the determination of copper content

GB/T 223.23 Iron steel and alloy - Determination of nickel content - The dimethylglyoxime spectrophotometric method (GB/T 223.23-2008, ISO 4939.1984, MOD)

GB/T 223.26 Iron steel and alloy - Determination of molybdenum content - The thiocyanate spectrophotometric method

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

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

GB/T 223.58 Methods for chemical analysis of iron, steel and alloy - The sodium arsenite-sodium nitrite titrimetric method for the determination of manganese 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 223.68 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 223.68-1997, ISO 671.1982, MOD)

GB/T 223.69 Iron steel and alloy - Determination of carbon contents - Gas-volumetric method after combustion in the pipe furnace

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 223.76-1994, ISO 9647.1989, MOD)

GB/T 223.78 Methods for chemical analysis of iron, steel and alloy - Curcumin spectrophotometric method for the determination of boron content (GB/T 223.78-2000, ISO 10153.1997, IDT)

GB/T 224-2008 Determination of depth of decarburization of steel (ISO 3887.2003, MOD)

GB/T 226 Test method for macrostructure and defect of steel by etching

GB/T 228.1 Metallic materials - Tensile testing - Part 1. Method of test at room temperature (GB/T 228.1-2010, ISO 6892-1.2009, MOD)

GB/T 229 Metallic materials - Charpy pendulum impact test method (GB/T 229-2007, ISO 148-1.2006, MOD)

GB/T 231.1 Metallic materials - Brinell hardness test - Part 1. Test method (GB/T 231.1-2009, ISO 6506-1.2005, MOD)

GB/T 702-2008 Hot-rolled steel bars - Dimensions, shape, weight and tolerances (ISO 1035-1.1980, ISO 1035-2.1980, ISO 1035-4.1982, MOD)

GB/T 1979 Standard diagrams for macrostructure and defect of structural steel

GB/T 2101 General requirement of acceptance packaging marking and certification for section steel

GB/T 2975 Steel and steel - Location and preparation of test pieces for mechanical testing (GB/T 2975-1998, eqv ISO 377.1997)

GB/T 3207-2008 Bright steel

GB/T 4162 Forged and rolled steel bars - Method for ultrasonic testing

GB/T 4336 Standard test method for spark discharge atomic emission spectrometric analysis of carbon and low - Alloy steel (routine method)

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

GB/T 7736 Ultrasonic inspecting method for macro-structure and imperfection of