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

GB/T 1222-2016

Replacing GB/T 1222-2007

Spring Steels

弹簧钢

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Bibliography

Foreword

The Standard is drafted according to the rules given in GB/T 1.1-2009 The Standard replaces GB/T 1222-2007 "Spring steels". Compared with GB/T 1222-2007, the main technical changes of this Standard are as follows:

steels are extended to 120 mm. The thickness of spring flat steels is extended to 60 mm. The diameter of the spring steel wire rods is extended to 40 mm (see Clause 1);

- ADD terms and definitions (see Clause 3);

56Si2MnCr, 60CrMnMo, 52CrMnMoV, 60Si2MnCrV, 52Si2CrMnNi, and their relevant technical requirements. Among them, 40SiMnVBE is the patented grade (see 6.1.1, 6.4, Annex B and Annex C);

- ADJUST the composition range of some steel grades, and ADD the requirements for phosphorus content and sulphur content (see Table 1);

- ADD the requirements for oxygen content for alloy spring steels (see 6.1.2);

- TIGHTEN the qualification level of macro defects (see 6.6.2 of this Standard,

- GROUPE the qualification level of nonmetallic inclusions, and ADD the requirement for the DS type inclusion (see 6.7 of this Standard, 5.7 of 2007 edition);

- ADD two cross-section shapes, i.e. plane great circle spring flat steel and plane rectangular spring flat steel, and their dimension requirements; CANCEL the cross-section shape of single-sided double-groove spring flat steel and its relevant requirements (see Annex A);

- ADD the main usage of different steel grades and the comparison table of national and international steel grades (see Annex B and Annex C).

This Standard was proposed by China Iron and Steel Industry Association This Standard shall be under the jurisdiction of National Technical Committee on Steel of Standardization Administration of China (SAC/TC 183).

Main drafting organizations of this Standard: Jiangyin Xingcheng Special Steel Works Co., Ltd., China Metallurgical Information and Standardization Institute, Fangda Special Steel Science and Technology Co., Ltd., Henan Productivity Promotion Center, Jiangsu Yonggang Group Co., Ltd., Beijing Jiaotong University, Xining Special Steel Co., Ltd., Dye Special Steel Co., Ltd.

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The previous released versions replaced by this Standard are as follows:

Introduction

The issuing authority of this document draws attention to the fact that, when the statement complies with this document, the relevant contents of Table 1, 6.1.2, Table 3, Table 4, D.2 and E.2 of this document relate to the use of 40SiMnVBE patented steel.

The issuing authority of this document takes no stand on the authenticity, validity and scope of patents.

The patent holder has assured the issuing authority of this document that he is willing to negotiate with any applicant on a reasonable and non-discriminatory terms and conditions regarding licensing of patents. The patent holder's statement has been filed with the issuing authority of this document. Related information can be obtained by the following way:

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1 Scope

The Standard specifies the terms and definitions, order contents, dimension, shape, weight, technical requirements, test methods, inspection rules, packaging, marking and quality certificate of hot-rolled, forged and cold-drawn spring steels.

The Standard is applicable to spring round steels and spring square steels with a nominal diameter or a side length of not more than 120 mm (hereinafter referred to as bars), spring flat steels with a nominal width of not more than 160 mm and a nominal thickness of not more than 60 mm, spring steel wire rods with a nominal diameter of not more than 40 mm.

The grades and chemical composition specified in this Standard are also applicable to steel ingots, billets and their products.

2 Normative references

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

3 Terms and definitions

Steel with elastic property and is used for manufacturing springs and elastic components. within the specified range, the elastic deformation capability enables the steel to withstand a certain load, and no permanent deformation occurs after the load is removed.

4 Order contents

The order contract or order based on this Standard shall include following contents:

- c) Steel grade or unified digital code;
- e) Dimension and accuracy (see Clause 5);
- f) Delivery condition or code (see 6.3);
- g) Hardenability requirement (if required, see 6.5);
- h) Nonmetallic inclusion group (see 6.7);
- i) Decarburization layer group (see 6.8);
- j) Special requirements (if required, see 6.10).

5 Dimension, shape and weight

6 Technical requirements

6.1 Grade and chemical composition

6.2 Smelting method

Unless otherwise specified in the contract, the smelting method is chosen by the manufacturing plant.

6.3 Delivery condition

The steel may be delivered according to the pressure processing method, heat treatment method, and surface roughness listed in Table 1. The specific delivery condition shall be indicated in the contract. For example: hot-rolled stress-relief-annealed spring steel (code: WHR+A); hot-rolled softening-annealed spring steel with level 1 surface roughness (code: WHR+SA+FB).

6.4 Mechanical property

6.5 End hardenability

6.5.1 55SiMnVB and 28SiMnB steel shall be subjected to the end hardenability test. The minimum Rockwell hardness value at 9 mm from the quenching end shall comply with the specification of Table 5. If the supply party can assure that the hardenability is qualified, this inspection may be exempted.

6.5.2 As required by the demand party and indicated in the contract, the end hardenability of other spring steels (excluding 55SiMnVB and 28SiMnB) may also be determined by the end hardenability test method or the DI value calculation method specified in Annex A of GB/T 5216-2014. The ordering method of hardenability band shall be implemented