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

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Replacing GB/T 9943-2008

High-speed tool steels

高速工具钢

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1 Scope

This document specifies the ordering details, classification, dimensions, shape and permissible deviations, technical requirements, test methods, inspection rules, packaging, marking and quality certificates for high-speed tool steel.

This document applies to hot-rolled and forged high-speed tool steel bars (round bars, square bars, flat bars, hexagonal bars, etc., hereinafter referred to as steel bars), wire rods, wires, bright steel bars, which have a nominal size (diameter, side length, thickness, or distance between opposite sides) not exceeding 350 mm; cold-rolled steel plates which have a nominal thickness not exceeding 4 mm and hot-rolled steel plates which have a nominal thickness not exceeding 15 mm; pre-hardened high-speed tool steel bars which have a nominal diameter of 1.0 mm ~ 15.0 mm and a polished or cold-drawn surface (all collectively referred to as steel products). The chemical composition also applies to steel ingots and billets.

2 Normative references

GB/T 223

GB/T 224

GB/T 226

GB/T 230.1

GB/T 231.1

GB/T 247

GB/T 702

GB/T 708-2019

3 Terms and definitions

The terms and definitions defined in GB/T 20566, as well as the following terms and definitions, apply to this document.

3.1 High-speed tool steel

A high-carbon, high-alloy ledeburitic tool steel with tungsten, molybdenum, chromium, vanadium (some also contain cobalt) as the main alloying elements, possessing high red hardness (maintaining high hardness at approximately 600 °C) and excellent wear resistance.

Note. See Appendix A for main characteristics and applications.

3.2 Pre-hardening

Pre-hardening refers to the process of heat treatment to bring the material to a specific hardness level required for service before manufacturing.

4.1 High-speed tool steels can be classified into two types based on chemical composition.

- a) Tungsten-based high-speed tool steel;
- b) Tungsten-molybdenum-based high-speed tool steel.

4.2 High-speed tool steels can be classified into three types based on performance.

- a) Low-alloy high-speed tool steel (HSS-L);
- b) Ordinary high-speed tool steel (HSS);
- c) High-performance high-speed tool steel (HSS-E or HSSE).

Note. See Appendix B for the basic characteristics of different categories of high-speed tool

steels.

5 Ordering information

Contracts or orders placed according to this document shall include the following.

- a) Document number;
- b) Product name;
- c) Designation;
- d) Cross-sectional shape (round, square, flat, hexagonal, etc.);
- e) Dimensions and shape;
- f) Weight (or quantity);
- g) Delivery condition;
- h) Special requirements (if any, see 7.7).

6.1 Smelting method

Steel shall be smelted by ladle refining or electroslag remelting, or by powder metallurgy or spray forming.

6.2.1 Steel (except pre-hardened steel bars) shall be delivered in the annealed condition,

or annealed and then processed by other methods.

6.2.2 Pre-hardened steel bars shall be made from annealed steel bars or coiled steel wire that has undergone continuous pre-hardening treatment after uncoiling. Delivery shall be in straight bars after pre-hardening treatment or after further polishing. Specific requirements shall be specified in the contract.

7.1.1 The designation and chemical composition (smelting analysis) of the steel shall

conform to the provisions of Table 1.