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

GB/T 8542-2023

High speed gear units - Technical specifications

高速齿轮传动装置技术规范

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1. Structure and Drafting Rules of Standardization Documents" Drafting. This document replaces GB/T 8542-1987 "Technical Conditions for Turbine Gear Transmission Devices". Compared with GB/T 8542-1987, except for the structure In addition to adjustments and editorial changes, the main technical changes are as follows:

- a) Changed the "scope" (see Chapter 1, 1.1 of the 1987 edition);
- b) Changed "Terms and Definitions" (see Chapter 3, 1.3 of the 1987 edition);
- c) Added "code name, overall dimensions" (see Chapter 4);
- d) Added "complete machine" technical requirements (see 5.1);
- e) Changed the technical requirements for "main components" (see 5.2, Chapter 2 of the 1987 edition);
- f) Added "assembly" requirements (see 5.4);
- g) Changed the "Complete Machine Test Method" (see Chapter 6, Chapter 3 of the 1987 edition);
- h) "Inspection" is deleted (see Chapter 4 of the 1987 edition);
- i) Added "random files and special tools" (see Chapter 7);
- j) Changed "marking, packaging, transportation and storage" (see Chapter 8, Chapter 5 of the 1987 edition);

1 Scope

China's national technical specification for high speed gear units. These are the gearboxes that couple turbines, compressors and large pumps in refineries, chemical plants, power stations and steelworks - machines transmitting many megawatts with a pinion turning at 3000 revolutions a minute or more, or a pitch line speed above 30 metres a second. At those speeds the engineering changes character entirely. The gear teeth are not lubricated so much as separated by an oil film sprayed into the mesh, and the oil carries away heat as much as it lubricates; the shafts run in hydrodynamic sliding bearings rather than rolling ones, because no rolling bearing survives; and the rotor dynamics of the shafts, their critical speeds and their stability, become a design constraint alongside the tooth strength. The standard specifies the product code, overall dimensions, technical requirements, machine inspection methods, accompanying documents and special tools, marking, packaging, transport and storage. It excludes gear units integrated into a prime mover or driven machine.

This document specifies the product code, overall dimensions, technical requirements, and complete machine of the high-speed gear transmission device 1) (hereinafter referred to as "gear device") Inspection methods, random documents and special tools, as well as marking, packaging, transportation and storage. This document is suitable for use in petroleum, chemical, electric power, metallurgy and other industries where sliding bearings

are supported, the tooth profile complies with GB/T 1356, and the pinion speed Gear transmission device with external meshing involute parallel shaft cylindrical hard tooth surface with a speed not less than 3000r/min or a pitch circle speed not less than 30m/s. Other high-speed gear transmission devices with similar structures can be implemented with reference to this document. This document does not apply to gear transmissions integrated with other rotating equipment such as prime movers or working machines.

2 Normative reference documents

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, the dated quotations For undated referenced documents, only the version corresponding to that date applies to this document; for undated referenced documents, the latest version (including all amendments) applies to this document.

GB/T 1174 Cast Bearing Alloy

GB/T 3098.1 Mechanical properties of fasteners bolts, screws and studs

GB/T 3181 paint film color standard

GB/T 3374.1 Gear terms and definitions Part

3 Coupled industrial machines

GB/T 17879 Chemical etching test for surface tempering of gears after grinding

GB/T 18329.1 Ultrasonic non-destructive testing of bonding strength of sliding bearings and multi-layer metal sliding bearings

GB/T 30121 Industrial platinum thermal resistor and platinum temperature sensing element

GB/T 30429 Industrial thermocouple

GB/T 37400.3 General technical conditions for heavy machinery Part

3. Welding parts 1) The high-speed gear device described in this document includes necessary components such as gears, shafts, boxes, sliding bearings, ventilation units, temperature measuring elements, bolts, seals, etc. And optional auxiliary components such as turning device, oil pump, vibration measuring element, base, coupling, oil mist fan, etc. The gear structure is single helical tooth or double helical tooth. gear For the normal module, see

GB/T 1357. The number of teeth of the large and small gears generally has no common denominator, and the gear ratio is generally not an integer.

5 Material strength and quality

GB/T 3836.1 Explosive atmosphere Part

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