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

GB/T 45981.1-2025

**Heavy casting and forging for heavy-duty gas turbine - Part 1:
Steel open die forgings**

重型燃气轮机用大型铸锻件 第1部分：钢质自由锻件

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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 for standardization documents" Drafting.

This document is Part 1 of GB/T 45981 "Large Castings and Forgings for Heavy-Duty Gas Turbines". GB/T 45981 has been published for the following part.

- Part 1: Steel open die forgings;
- Part 2: High temperature alloy die forgings;
- Part 3: Steel castings.

Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents.

This document was proposed by the China Machinery Industry Federation.

This document is under the jurisdiction of the National Technical Committee for Standardization of Large Castings and Forgings (SAC/TC506).

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Introduction

Heavy-duty gas turbines are the core power equipment of energy efficient conversion and clean utilization systems and are widely used in power generation, distributed energy and electricity.

Heavy-duty gas turbine castings and forgings are the most important products of heavy-duty gas turbines.

The development foundation of the industry, with the development of heavy-duty gas turbine industry, its castings and forgings have made breakthroughs and formed a series of material systems.

To promote common benefits, it is necessary to propose material selection, ordering, manufacturing, testing methods and inspection rules for large castings and forgings used in heavy-duty gas turbines.

GB/T 45981 "Large Castings and Forgings for Heavy-Duty Gas Turbines" was formulated for this purpose.

Provide a basis for manufacturing and technical exchanges, and cultivate and enhance the material supporting capabilities of the heavy-duty gas turbine industry.

Due to the differences in materials, manufacturing and supply chains of components, GB/T 45981 is intended to consist of three parts.

- Part 1: Steel free forgings. The purpose is to standardize the shaft head, center tie rod, compressor and turbine wheel for heavy-duty gas turbines Manufacturing of large steel free forgings.
- Part 2: High-temperature alloy die forgings. The purpose is to standardize high-temperature alloy large die forgings and tie rod forgings for heavy-duty gas turbines Manufacturing of parts.

- Part 3: Steel castings. The purpose is to standardize heavy-duty gas turbines gravity cast using sand molds or molds with thermal conductivity equivalent to sand molds Used in the manufacture of large steel castings.

Large castings and forgings for heavy-duty gas turbines Part 1: Steel open die forgings

1 Scope

This document specifies the supplier requirements, manufacturing process, technical specifications, and other requirements for large alloy structural steel and martensitic heat-resistant steel free forgings for heavy-duty gas turbines.

It specifies the technical requirements, describes the corresponding test methods, and stipulates the inspection rules, acceptance and quality certificates, as well as labeling and packaging.

This document is applicable to F-class heavy-duty gas turbine shaft heads, center tie rods, compressors, turbine wheels and other steel free forgings (hereinafter referred to as forgings manufacturing of parts).

2 Normative references

GB/T 223.42

GB/T 223.43

GB/T 223.79

GB/T 223.82

GB/T 223.88

GB/T 223.90

GB/T 228.1

GB/T 228.2

GB/T 229

GB/T 2975

GB/T 4336

GB/T 6394

GB/T 7232

GB/T 8541

GB/T 9445