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

GB/T 44508-2024

**Wind energy generation systems - Specification for ring
forgings of wind turbines**

风能发电系统 风力发电机组环形锻件技术规范

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Table of Contents

- 1 Scope
- 2 Normative references
- 3 Terms and definitions
- 4 Magnetic particle testing
- 5 Test methods
- 6 Inspection Rules

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 is required. This document was proposed by the China Machinery Industry Federation. This document is under the jurisdiction of the National Technical Committee for Standardization of Wind Power Generation (SAC/TC 50). This document was drafted by: Elaite Energy Equipment Co., Ltd., Shanxi Tianbao Group Co., Ltd., Goldwind Science & Technology Co., Ltd. Co., Ltd., Tongyu Heavy Industry Co., Ltd., Shanghai Electric Wind Power Group Co., Ltd., Wuxi Parker New Materials Technology Co., Ltd., Shanxi Jinrui Guangyuan Heavy Industry Technology Group Co., Ltd., Yunda Energy Technology Group Co., Ltd., Mingyang Smart Energy Group Co., Ltd., Harbin Electric Wind Energy Co., Ltd., CRRC Shandong Wind Power Co., Ltd., CRRC Zhuzhou Electric Locomotive Research Institute Co., Ltd. Wind Power Division, Siemens Mesa Renewable Energy Technology (China) Co., Ltd., CSSC Offshore Wind Power Co., Ltd., Guodian United Power Technology Co., Ltd., China Yangtze River China Three Gorges Corporation, Shanghai Taisheng Wind Energy Equipment Co., Ltd., Envision Energy Co., Ltd., Dongfang Electric Wind Power Co., Ltd. Shanghai Energy Technology Development Co., Ltd., Beijing Jianheng Certification Center Co., Ltd., China Quality Certification Center, Hunan Southern Aerospace High Precision Transmission Co., Ltd., Renben Co., Ltd., Jiangyin Xingcheng Special Steel Co., Ltd., Shanxi Shuanghuan Heavy Industry Group Co., Ltd., Shanxi Fu Xingtong Heavy Ring Forging Co., Ltd., Shanxi Baohang Heavy Industry Co., Ltd., Jiangyin Hengrun Ring Forging Co., Ltd., Dandong Fengneng Industrial Co., Ltd. company. The main drafters of this document are. Zhao Limei, Niu Jiazhen, Wang Liliang, Xu Yong, Ren Xiufeng, Yang Houlei, Li Yongzhi, Chen Fei, Lan Pengguang, Yin Ming, He Xifeng, Yang Xuebing, Wang Ziyue, Ouyang Hua, Li Yue, Lan Yongsen, Zheng Liang, Ma Li, Zhang Jie, Guo Wenhui, Zhu Xingman, Zhang Bangqiang, Yang Rongchang, Jiang Shaohui, He Changjian, Hu Dawei, Zhang Yanling, Chen Kui, Liu

Bin, Dong Juan, Yan Zhiwei, Yan Chenyang, Zhang Tiehong, Yan Pengtao, Yan Jiangtao, Guo Jisen, Tang Guanglin and An Fengjun. Wind power generation system Wind turbine ring forgings Technical Specifications

1 Scope

GB/T 44508-2024 is the Chinese specification for the ring forgings used in wind turbines: the rolled rings that become the yaw and pitch bearing races, the tower flanges and the main shaft and gearbox rings. They are among the largest forgings made in series anywhere, several metres across, and they carry the whole machine, so a defect in one is not repairable in the field. The standard sets the requirements on the steel and its melting and refining route, the forging and ring rolling process and the required deformation ratio, the heat treatment and the properties required after it, the chemical composition and the mechanical properties including the low temperature impact toughness that a turbine in northern China needs, the internal quality and the ultrasonic examination and its acceptance criteria, the surface quality and the magnetic particle examination, the dimensional tolerances and machining allowances, the test methods, the inspection rules and the marking, packaging and quality certificate. For a forge, a bearing maker or a turbine manufacturer in China, this is the acceptance text.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document.

GB/T 222 Permissible deviation of chemical composition of finished steel products

GB/T 223 (all parts) Chemical analysis methods for steel and alloys

GB/T 223.82 Determination of hydrogen content of steel - Inert gas fusion - Thermal conductivity or infrared method

GB/T 225 End quenching test method for hardenability of steel (Jominy test)

GB/T 228.1-2021 Tensile test of metallic materials Part

GB/T 1184-1996 Shape and position tolerances without tolerance values

GB/T 1591 Low alloy high strength structural steel

GB/T 1804-2000 General tolerances Tolerances of linear and angular dimensions without tolerance indication

GB/T 3077 Alloy structural steel

GB/T 4336 Determination of multi-element content of carbon steel and medium and low alloy steel Spark discharge atomic emission spectrometry (conventional method)

GB/T 5313-2023 Thickness properties of steel plates

GB/T 6394 Determination of average grain size of metals

GB/T 10561-2023 Determination of non-metallic inclusions in steel - Standard for determination of non-metallic inclusions in steel - Microscopic examination method using a rating chart

GB/T 11261 Determination of oxygen content of iron and steel - Pulse heating inert gas fusion - infrared absorption method

GB/T 13320-2007 Metallographic structure rating diagram and evaluation method for steel die forgings

GB/T 17394.1 Leeb hardness test for metallic materials Part

3 Terms and definitions

The following terms and definitions apply to this document.