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

GB/T 46977-2026

**Determination of nitrogen, sulfur and phosphorus in foundry
reclaimed sand**

铸造用再生砂氮、硫、磷含量测定方法

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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. Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents. This document was proposed and is under the jurisdiction of the National Technical Committee on Foundry Standardization (SAC/TC54). This document was drafted by: Jinan Shengquan Group Co., Ltd., Henan Feilong (Wuhu) Auto Parts Co., Ltd., and Hebei Yuexin New Materials Co., Ltd. Building Materials Manufacturing Co., Ltd., Liujing Technology Group Co., Ltd., Jiangsu Wanheng New Materials Technology Co., Ltd., Liuzhou Liujing Environmental Protection Technology Co., Ltd. Limited Liability Company, Sanmenxia Sunshine Casting Co., Ltd., Sanming Yijun Machinery Casting Co., Ltd., Taigang Alloy (Zhongshan) Co., Ltd., Guangxi Lanzhou Keyuan Recycling Co., Ltd., Chongqing Changjiang Molding Materials (Group) Co., Ltd., Xixia Feilong Special Casting Co., Ltd., Changluo (Liaocheng) Intelligent Manufacturing Co., Ltd., Shenyang Foundry Research Institute Co., Ltd. of China Academy of Machinery Science and Technology, Huazhong University of Science and Technology, Beijing Jiaotong University Shenyang University of Technology, Wuhan University of Engineering, Wuxi Sanfeng Instrument Equipment Co., Ltd., Chengde Beiyan New Material Technology Co., Ltd., Chengde Dongwei New Materials Technology Co., Ltd., Yingkou Hengyuan Casting Materials Co., Ltd., Henan Jintaiyang Precision Casting Co., Ltd., Zhejiang Sui Jinte Casting Co., Ltd., Guangxi Jinchuang Auto Parts Manufacturing Co., Ltd., Hebi Xinrong Casting Co., Ltd., Wuhu Honghu Materials Technology Co., Ltd., Hebei Ruifeng Technology Co., Ltd., Qufu Longxiang Metallurgical Casting Auxiliary Materials Co., Ltd., Hubei Gucheng County Donghua Machinery Co., Ltd. The company, Yibin Push Linkage Technology Co., Ltd., Ningbo Ligu Machinery Manufacturing Co., Ltd., Cixi Huili Electromechanical Co., Ltd., Shandong Haoxin Joint-stock company, SAIC Volkswagen Automotive Co., Ltd., Aero Engine Corporation of China, Liyang Wansheng Foundry Co., Ltd., Hangzhou Aircraft Industry Group Co., Ltd. Fenqi Gas Products Inspection and Testing Co., Ltd. The main drafters of this document are. Li Na, Li Donghua, Chai Xiufeng, Zhang

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1 Scope

GB/T 46977-2026 is the Chinese national standard covering the residues left in reclaimed foundry sand - nitrogen from the resin binders causes pinhole porosity in the casting, sulfur degrades spheroidal graphite iron, and both accumulate every time the sand is reused. First edition, and it is what makes sand reclamation controllable rather than a gamble. It was issued on 28 January 2026 and has been in force since 1 August 2026, as a first edition. The document is under the responsibility of the Standardization Administration of China. This page is published from the official record of the 2026 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document describes the methods for determining the nitrogen, sulfur, and phosphorus content of recycled foundry sand. This document applies to resin-regenerated foundry sand (regenerated silica sand, regenerated chromite sand, regenerated magnesium olivine sand, and regenerated spherical ceramic sand). Determination of nitrogen, sulfur and phosphorus content. This document does not apply to the determination of nitrogen, sulfur, and phosphorus content in recycled water glass casting sand.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 601 Preparation of Standard Titration Solutions for Chemical Reagents

GB/T 603 Preparation of reagents and products used in chemical reagent test methods

GB/T 5611 Casting Terminology

GB/T 31190 Technical Specification for Collection of Laboratory Waste Chemicals

3 Terms and Definitions

The terms and definitions defined in GB/T 5611 apply to this document.

4 Nitrogen content determination (Kjeldahl method)

4.1 Principle The nitrogen in the regenerated sand is converted into ammonia through a reaction. The distilled ammonia is absorbed by boric acid solution, and the nitrogen content is determined by acid-base titration.

4.2 Instruments Instruments for nitrogen content determination.

- a) Adjustable temperature electric heating mantle.
- b) Kjeldahl nitrogen analyzer. recovery rate $(100 \pm 1)\%$.
- c) Electronic balance. accuracy 0.01g.
- d) Electronic analytical balance. accuracy 0.0001g.
- e) Pipette. 10 mL, graduation value 0.1 mL.
- f) Burette. 50mL acid burette, graduation value 0.1mL, Grade A.
- g) Erlenmeyer flasks. 150mL, 500mL.
- h) Condenser. 600mm straight condenser.
- i) Graduated cylinders. 50mL, 250mL.
- j) Kjeldahl nitrogen determination flask. 500mL.