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**NATIONAL STANDARD OF THE
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GB/T 31562-2024

**Foundry machinery - Method for the determination of
cleanliness**

铸造机械 清洁度测定方法

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Table of Contents

1 Scope	1
2 Normative references	1
3 Terms and Definitions	1
4. Selection basis of cleanliness determination method and cleanliness assessment method	3
4.1 Basis for selecting cleanliness determination method	3
4.2 Cleanliness Assessment Methods	4
5 Gravimetric method	4
5.1 Sampling	4
5.2 Filter	4
5.3 Drying	6
5.4 Weighing	6
5.5 Calculation and determination	6
6 Particle counting method	7
6.1 Microscopic particle counting method	7
16 Table D.1 Cleanliness level code table	17

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 replaces GB/T 31562-2015 "Method for determination of cleanliness of casting machinery". In addition to structural adjustments and editorial changes, the main technical changes are as follows:

- a) The "scope" has been redefined (see Chapter 1, Chapter 1 of the 2015 edition);
- b) Change "methods and procedures for determining cleanliness" to "basis for selecting cleanliness determination methods and methods for evaluating cleanliness", delete The technical terms of the determination procedure were revised, and the technical terms of the selection basis of the cleanliness determination method and the cleanliness assessment method were added. Paragraph (see Chapter 4, Chapter 3 of the 2015 edition);
- c) Change the "microscope method" in the cleanliness determination method to "particle counting method" (see 4.1, 4.2, Chapter 6, 2015 edition) 3.1, 3.3, Chapter 6);

d) Deleted "microscope particle contrast method" (see 3.3, 6.3.1, 6.3.2 of the 2015 edition);

e) Added "Automatic particle counting method" (see 4.1.1, 6.2). 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 Foundry Machinery Standardization Technical Committee (SAC/TC186). This document was drafted by: Nan'an Zhongji Standardization Research Institute Co., Ltd., Shenzhen Lingwei Technology Co., Ltd., Yonghong Baoding Foundry Machinery Co., Ltd., Nantong Weiersi Machinery Technology Co., Ltd., Guoke Weilai (Xiamen) Technology Co., Ltd., Anqing Normal University, Zhejiang Wanfeng Technology Development Co., Ltd., Wuxi Lihu New Quality Energy Saving Technology Co., Ltd., Fujian Minxuan Technology Co., Ltd., Jinan Casting and Forging Institute Inspection and Testing Technology Co., Ltd., Zhejiang Qianjin HVAC Technology Co., Ltd., Anhui Anhuang Machinery Co., Ltd., China Automotive Industry Engineering Co., Ltd., Qingdao Antai Heavy Industry Machinery Co., Ltd., Qingdao Zhongzhida Environmental Protection Melting Equipment Co., Ltd., Qingdao Qingli Environmental Protection Equipment Co., Ltd., Qingdao Kaijie Heavy Industry Machinery Co., Ltd., Qingdao Beinuo Magnetic Technology Co., Ltd., Jiarui Technology (Huizhou) Co., Ltd., Quanzhou Standard Standardization Association, Fujian Dehua Lumin Yijia Ceramics Cultural and Creative Co., Ltd., Shandong Jie Chuang Machinery Co., Ltd., Weihai Gongyou Foundry Machinery Co., Ltd., Qingdao Sanrui Machinery Manufacturing Co., Ltd., Jiaozhou Administrative Approval Service Bureau, Jinan Ruisheng Casting Machinery Co., Ltd., China National Heavy Duty Truck Group Jinan South Power Co., Ltd. Molding Plant. The main drafters of this document are: Zhu Bin, Pan Lingling, Li Yanqing, Shi Chuanming, Fu Zhihong, Wu Qiong, Wu Jun, Shi Kaiwang, Chen Huiling, Lu Jun, Zhao Lichao, Huang Changwen, Liu Caisheng, Liu Xiaolong, Ding Renxiang, Duan Jinting, Yu Kuopei, Su Liguang, Li Haichun, Li Yuanfa, Huang Zhiqiang, Zhu Fangfang, Li Lan, Zhang Xuxia, Zhang Jie, Chi Yingjie, Yan Zuoxiu, Zhu Jinlin, Xiang Ziqiang, Bai Yang, Liang Shujie, Li Chen, Duan Yudong, Nie Yuhang. The previous versions of this document and the documents it replaces are as follows:

---First published in 2015 as GB/T 31562-2015;

---This is the first revision.

The cleanliness of casting machinery is the residual solid pollution on the surface of parts with cleanliness requirements or in the hydraulic and lubrication systems of casting machinery. The amount of solid pollutants (such as metal chips, sand, dust, fibers and other debris) on the performance and service life of the product and reliability. The cleanliness of casting machinery is an important quality indicator, which can usually be expressed by the mass limit of solid contaminants and/or the size of solid particles. The cleanliness level expressed in different ways is expressed in different ways using different cleanliness

measurement methods, such as Gravimetric method, particle counting method, etc. Since its first release, this document has provided technical support for the cleanliness determination of foundry machinery in my country and has played a significant role in standardizing the cleanliness inspection of foundry machinery. However, with the advancement of computer technology, pattern recognition and analysis technology in recent years, Cleanliness detection technology has also been newly developed. Some of the original technical clauses of this document have lagged behind. Cleanliness determination method, incorporates and reflects the current advanced technical achievements in cleanliness detection, promotes technological progress, and provides foundry machinery manufacturers with In order to provide inspection basis that is more in line with international requirements for third parties, it is necessary to revise GB/T 31562-2015. Method for determination of cleanliness of foundry machinery

1 Scope

China's national method for determining the cleanliness of foundry machinery, and the current edition of GB/T 31562, replacing the 2015 edition. It specifies the basis on which a determination method is selected, the methods for assessing cleanliness, the gravimetric method, and the particle counting methods by microscope and by automatic counter, with normative annexes on sampling and on the cleanliness level codes. Cleanliness here means the quantity and size of solid contaminant present in a machine or in its fluids, and it is a property of a machine as it is delivered and as it runs. It matters in foundry machinery for a reason peculiar to the sector: the machines work in the dirtiest environment in metalworking, surrounded by sand, dust and abrasive fines, while depending on hydraulic and lubrication systems whose clearances are measured in micrometres. A particle that would be harmless in the sand system destroys a servo valve, and the wear it causes releases more particles, so contamination is self-accelerating once it starts. The gravimetric method weighs the contaminant caught on a filter and reports a mass; the particle counting methods count and size the particles instead, either under a microscope or with an automatic counter. Neither replaces the other: a mass tells you how much is there and a count tells you how large the largest particles are, and it is the largest particles that destroy a valve. The 2024 revision redefines the scope, replaces the former methods and procedures chapter with a chapter on how a method is selected and how the result is assessed, and renames the microscope method as particle counting, bringing the automatic counter into the standard alongside it. Issued on 29 September 2024 and in force since 1 April 2025.

This document provides the selection basis and cleanliness assessment method for foundry machinery cleanliness. Determine the method. This document applies to the determination of cleanliness of foundry machinery.

2 Normative references

The contents of the following documents constitute 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 37163 Hydraulic transmission - Determination of particle contamination of liquid samples by automatic particle counting method using the light shielding principle

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 Contaminants Solid particles contained in the object being measured that have a harmful effect on the working performance, service life and reliability of the casting machinery (such as metal cutting chips, sand, dust, fibers and other debris).

Note. The objects to be measured are usually the surfaces of parts or hydraulic and lubrication systems of casting machinery with cleanliness requirements.

3.2 Cleanliness The amount of pollutants contained in the object being measured.

3.3 Gravimetry A method of determining cleanliness by detecting the mass of contaminants.

Note. The mass value of pollutants is usually expressed in milligrams (mg).

3.4 The cleanliness is determined by detecting the particle size of pollutants in the liquid sample or on the filter test piece and the number of particles in different size ranges. Cleanliness method.

3.5 Particle counting method using optical microscopy and manual counting.

3.6 A particle counting method that uses an automatic particle counter or image recognition and analysis equipment with a camera function to automatically measure and count particles.