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**NONFERROUS METALS INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

YS/T 63.9-2012

Replacing YS/T 63.9-2006

**Carbonaceous materials used in the production of aluminium.
Part 9: Determination of truth density by helium pycnometry
method**

铝用炭素材料检测方法 第9部分：真密度的测定 氦比重计法
(English Translation)

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Table of Contents

Foreword
1 Scope
2 Normative references
3 Terms and Definitions

Foreword

YS/T 63 "Carbonaceous material for aluminum," a total of 26 parts.

- Part 1. firing process, firing weightlessness measurement sample measurement cathode paste and green specimens apparent density;
- Part 2. Determination of cathode blocks and prebaked anodes room temperature resistivity;
- Part 3. Determination of the thermal conductivity of Comparative Law;
- Part 4. Determination of thermal expansion coefficient;
- Part 5. Determination of pressure at the bottom there is sodium expansion of carbon block;
- Part 6. Determination of open porosity hydrostatic law;
- Part 7. Determination of apparent density size method;
- Part 8. Determination of density in xylene Pyknometer;
- Part 9. Determination of true density of helium hydrometer method;
- Part 10. Determination of air permeability;
- Part 11. Determination of the reactivity to air mass loss method;
- Part 12. Determination of the reactivity prebaked anode CO₂ mass loss method;
- Part 13. Determination of Young's modulus of the static measurement method;
- Part 14. Determination of flexural strength of three-point method;
- Part 15. Determination of compressive strength;
- Part 16. Determination of Trace Elements in X-ray fluorescence spectrometry method;
- Part 17. Determination of volatile matter;

- Part 18. Determination of moisture content;
- Part 19. Determination of ash content;
- Part 20. Determination of sulfur;
- Part 21. cathode paste firing the expansion/contraction of determination;
- Part 22. Determination of equivalent temperature roasting degree method;
- Part 23. Determination of the reactivity to air prebaked anode thermal gravimetry;
- Part 24. Determination of the reactivity prebaked anode carbon dioxide thermal gravimetry;
- Part 25. Determination of no pressure sodium expansion of the bottom of the carbon block;
- Part 26. Determination of refractories cryolite penetration ability.

Part is divided into 9 parts.

This section drafted in accordance with GB/T 1.1-2009 given rules.

The partial replacement of YS/T 63.9-2006.

This section uses redrafted Law Amendment uses ISO 21687:2007 "aluminum with helium as the analysis gas carbon materials - Determination of true density of solid material. " This part of ISO 21687:2007 made the following editorial changes.

- Remove the ISO 21687:2007 directory, foreword, introduction, and references;
- Standard name in accordance with the requirements of this series of standards has been modified.

This part of ISO 21687:2007, compared with more adjustment in the structure, listed in Appendix A of this part of the ISO 21687:2007 the reg number control list.

This part of ISO 21687:2007 technical differences exist compared to the terms of these differences has been involved through its outer margin bits Set a single vertical line (|) have been marked, Appendix B gives a list of corresponding technical differences and their causes.

The non-ferrous metal part by the National Standardization Technical Committee (SAC/TC243) centralized.

This section is responsible for drafting units. Aluminum Corporation of China Zhengzhou Research Institute, China Nonferrous Metals Industry Quality Standards and Metrology Institute the study.

Participated in the drafting of this section. Shandong Chenyang Carbon Co., Ltd.,

Shandong Nanshan Aluminum Co., Ltd.

1 Scope

YS/T of the provisions of section 63 of the helium hydrometer Determination true density of aluminum with carbon materials.

This section applies to cathode blocks, prebaked anode, calcined petroleum coke true density determination, other solid materials can also refer to this method.

This section does not apply to the graphite material.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version suitable for use herein Member. For undated references, the latest edition (including any amendments) applies to this document.

GB/T 26297.1 carbonaceous materials used in aluminum sampling method Part 1. Bottom charcoal GB/T 26297.2 carbonaceous materials used in aluminum sampling methods - Part 2. side charcoal GB/T 26297.3 carbonaceous materials used in aluminum sampling methods - Part 3. prebaked anode GB/T 26297.6 carbonaceous materials used in aluminum sampling methods - Part 6. calcined petroleum coke

3 Terms and Definitions

The following terms and definitions apply to this document.

Density of a solid material true density of the solid material ρ , the weight per unit volume, according to the formula (1).

$\rho =$

Where.

ρ --- true density in grams per cubic centimeter (g/cm³);

m --- mass in grams (g);

The V --- volume of solid material, does not include any pores, cubic centimeters (cm³).

Note: The volume of solid material herein does not include the open pore volume.

Principle 4

The sample was milled and sieved to less than 0.063mm. In helium gas analysis, measuring the density of the gas specific gravity meter. Weighing dry Quality dry samples will be loaded into the analysis chamber. Helium is introduced into the analysis chamber and pressurized to a predetermined value. Then enters the expansion helium expansion

room. Instrument recording pressure balance these two steps. By volume and the quality of gas specific gravity measurement of the sample can be calculated sample true density.