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

**GB/T 46589-2025**

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**Measurement and calculation method of thermal equilibrium  
and thermal efficiency of ceramic spray dryers**

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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 by the China Building Materials Federation. This document is under the jurisdiction of the National Technical Committee on Standardization of Building Materials and Equipment (SAC/TC465). This document was drafted by: Guangzhou Energy Testing and Research Institute, Foshan Henglitai Technology Co., Ltd., and Foshan Keda Electromechanical Co., Ltd. Guangdong Nanhua Energy Conservation and Low-Carbon Development Research Institute, China Building Materials Machinery Industry Association, Guangdong Zhizi Intelligent Technology Co., Ltd., Guangzhou Huijin Energy Xiao Technology Co., Ltd. The main drafters of this document are. Huang Kuo, Yang Ru, Xie Yuelin, Zhou Chengjuan, Yao Zhichen, He Weidong, Hu Liangyong, Luo Fusheng, Wang Yumin, and Tang Dan. Huang Yunsheng, Yang Fei, Mai Tuqin, Huang Xiaoping, Duan Zhen, Xie Fangjing, Yi Guogang, Zhang Weijun, Zhang Hong. Thermal balance and thermal efficiency of ceramic spray drying tower Measurement and Calculation Methods

## 1 Scope

GB/T 46589-2025 is the Chinese national standard covering the heat balance of a spray dryer - the fuel in, the water evaporated, the losses in the exhaust and through the walls, and the efficiency that comes out of it, on the single largest energy consumer in a tile plant. First edition, in force from 1 May 2026. Issued on 31 October 2025, it has been in force since 1 May 2026.

This document specifies the units, symbols, and standards for the determination and calculation of heat balance and thermal efficiency in ceramic spray drying towers, as well as the heat balance boundary diagram and measurement... Project and measurement methods, material balance calculation methods, heat balance calculation methods, and thermal efficiency calculation methods. This document applies to the determination and calculation of heat balance and thermal efficiency of spray drying towers used for preparing building ceramic powders with fuel as the main heat source.

## 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 211 Determination of Total Moisture in Coal

GB/T 212 Industrial Analysis Methods for Coal

GB/T 213 Method for Determination of Calorific Value of Coal

GB/T 260 Determination of water content in petroleum products by distillation method

GB/T 384 Determination of calorific value of petroleum products

GB/T 12206 Methods for Determination of Calorific Value and Relative Density of Urban Gas

GB/T 24851 Requirements for the Configuration and Management of Energy Measuring Instruments in the Building Materials Industry

GB/T 27896 Determination of water content in natural gas - Electronic analytical method

GB/T 28890-2012 Terminology for Building Ceramic Machinery

## 3 Terms and Definitions

The terms and definitions defined in GB/T 28890-2012, as well as the following terms and definitions, apply to this document.

3.1 spray dryer A device that introduces a slurry of a certain concentration into a drying tower with hot air, and obtains powder of a certain particle size through atomization and drying. [Source: GB/T 28890-2012, 2.9.2.1, with modifications]

3.2 Absolutely dry powder Powder that does not contain free radical moisture.

## 4 Units, Symbols, and References

4.1 Unit Calorie to Joule conversion.  $1 \text{ cal} = 4.1816 \text{ J}$ .

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