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NATIONAL STANDARD OF THE  
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## GB/T 33654-2017

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### **The Norm of Energy Consumption Per Unit Throughput of Gypsum Plaster**

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**Issued on: May 12, 2017**

**Implemented on: June 1, 2018**

**Issued by: General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China;  
Standardization Administration of the People's Republic of China.**

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## Foreword

This Standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This Standard was proposed by National Development and Reform Commission Resource Conservation and Environmental Protection Division and Ministry of Industry and Information Technology Energy Saving and Comprehensive Utilization Division.

This Standard shall be under the jurisdiction of the National Standardization Technical Committee on Energy Base and Control (SAC/TC 20) and China Building Materials Federation.

The drafting organizations of this Standard: China New Building Materials Design and Research Institute, Beijing New Building Material (Group) Co., Ltd., Knauf New Building Material (Wuhu) Co., Ltd., Tai Shan Gypsum Co., Ltd., Boluo Gypsum Building Material (Shanghai) Co., Ltd., Saint-Gobain Gypsum Building Material (Shanghai) Co., Ltd., Shandong Baier Building Material Co., Ltd., Jason Gypsum Board (Jiaxing) Co., Ltd., Huangshi Building Material and Energy-saving Equipment Factory.

The main drafters of this Standard: Wei Chaoping, Hao Xiaodong, Wang Yufeng, Wang Yongsheng, Liu Tong, Wang Jianqiang, Chen Yong, Ren Xulian, Li Jing, Liu Yue, Xu Huixian, Shi Peike, Yu Chuan, Zhang Hao, Sun Fengyuan, Xu Qiang, Yang Chengwen, Guo Taimin, Yang Nianlong.

# The Norm of Energy Consumption Per Unit Throughput of Gypsum Plaster

## 1 Application Scope

This Standard specifies the terms and definitions, specifications, statistical scope and method, and calculation method of the norm of energy consumption per unit throughput of gypsum plaster (hereinafter referred to as energy consumption).

This Standard applies to the calculation, management and assessment of the energy consumption for gypsum plaster production of the gypsum plaster production enterprises and gypsum plaster products production enterprises, and the energy consumption control for the new or renovation and extension projects.

## 2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition dated applies to this document. For undated references, the latest edition of the referenced documents (including all amendments) applies to this Standard.

GB/T 213, *Determination of Calorific Value of Coal*

GB/T 384, *Determination of Calorific Value of Petroleum Products*

GB/T 2589, *General Principles for Calculation of the Comprehensive Energy Consumption*

GB/T 9776, *Calcined Gypsum*

GB/T 12723, *General Principles for Establishing Allowance of Energy Consumption Per Unit Throughput*

GB/T 17608, *Division of Variety and Grading for Coal Products*

GB 17820, *Natural Gas*

## 3 Terms and Definitions

For the purposes of this document, those defined in GB/T 12723 and the following terms and definitions apply.

### 3.1

## **gypsum**

The material whose main constituent is calcium sulphate dihydrate ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ) containing two crystal waters, including natural gypsum and industrial by-product gypsum.

NOTE Also known as plaster stone.

### **3.2**

#### **industrial by-product gypsum**

The by-product which is produced by chemical reactions during the industrial production process and contains much calcium sulphate dihydrate, such as flue gas desulfurization gypsum, phosphorous gypsum, fluorine gypsum, titanium gypsum and citrate gypsum.

### **3.3**

#### **purity of gypsum**

The mass fraction (%) of calcium sulphate dihydrate in unit mass of a material after attached water is removed.

### **3.4**

#### **gypsum plaster**

The powdery cementing material which is made by calcining gypsum, with  $\beta$  semi-hydrated gypsum ( $\beta\text{-CaSO}_4 \cdot 1/2\text{H}_2\text{O}$ ) as the main constituent and without adding any additives, including natural gypsum plaster and industrial by-product gypsum plaster.

### **3.5**

#### **natural gypsum plaster**

Gypsum plaster which is made of natural gypsum.

### **3.6**

#### **gypsum plaster from industrial by-product**

Gypsum plaster which is made of industrial by-product gypsum.

### **3.7**

#### **comprehensive energy consumption for gypsum plaster**

The total of all kinds of energy sources consumed in the production process of gypsum plaster during the period of statistics.

## 6 Statistical Scope and Statistical Method

**6.1** The energy consumption per unit throughput for gypsum plaster shall be accounted based on the accounting unit of the per unit throughput of acceptable products conforming to GB/T 9776.

**6.2** The comprehensive energy consumption per unit throughput for gypsum plaster shall be calculated in accordance with all energy sources consumed during the production process specified in GB/T 2589, including the energy consumption of main production system, auxiliary production system and subsidiary production system.

**6.3** The loss of fuel in storage shall be reckoned in.

**6.4** The following energy consumption shall be deducted in the energy consumption:

- a) office energy consumption;
- b) domestic energy consumption.

**6.5** The statistical scope of energy consumption per unit throughput for gypsum plaster covers the whole production process from the raw materials entering the factory area to the gypsum plaster leaving factory or the gypsum plaster entering finished goods warehouse.

**6.6** The calorific values of fuels are determined respectively. The calorific values of solid fuels are determined as specified in GB/T 213, and they may also be determined as specified in GB/T 17608; the calorific values of liquid fuels are determined as specified in GB/T 384; the calorific value of natural gas is determined as specified in GB 17820. The enterprises may refer to Annex A when they are unable to determine the calorific values of fuels.

**6.7** In this statistical method, the calculation basis of gypsum is the purity 92% and attached water content 3%, and the attached water content is on an as-received basis.

**NOTE** The mass fraction of attached water content = (material mass on an as-received basis – material mass on a dry basis)/material mass on an as-received basis × 100%.

## 7 Calculation Method

### 7.1 Energy consumption for gypsum plaster

**7.1.1** The comprehensive energy consumption for gypsum plaster shall be calculated in accordance with Formula (1):

$$E_m = \frac{M_s Q_s + M_b Q_b + M_c Q_c + M_d Q_d}{R} + DM_e \quad \dots\dots\dots (1)$$

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Contact: Wayne Zheng, [Sales@ChineseStandard.net](mailto:Sales@ChineseStandard.net)

Linkin: <https://www.linkedin.com/in/waynezhengwenrui/>

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