

ICS 27.010
CCS F01



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

GB 37484-2019

**Minimum allowable values of energy efficiency and energy
efficiency grades for precipitator**

除尘器能效限定值及能效等级

Issued on: April 4, 2019

Implemented on: November 1, 2020

**Issued by: State Administration for Market Regulation;
Standardization Administration of China**

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1 Scope

GB 37484-2019 is the Chinese national standard on minimum allowable values of energy efficiency and energy efficiency grades for precipitator, in the field of energy and heat transfer engineering. It carries no /T suffix, which in the Chinese system means compliance is mandatory: a product or a practice within its scope has to meet it to be lawfully made, sold or carried out in China. It was issued on 4 April 2019 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 November 2020. Classification: ICS 27.010, CCS F01. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This Standard stipulates energy efficiency grades, minimum allowable values of energy efficiency and energy efficiency test methods for precipitator. This Standard is applicable to dry electrostatic precipitator for coal-fired power plant boiler flue gas dust removal; bag precipitator for coal-fired boiler flue gas dust removal in the power industry; bag precipitator for cement new-type dry rotary kiln flue gas dust removal in the building materials industry; bag precipitator for sintering flue gas semi- dry desulfurization dust removal in the iron and steel industry; electrostatic-fabric integrated precipitator for coal-fired power plant boiler and cement new-type dry rotary kiln flue gas dust removal.

2 Normative References

The following documents are indispensable to the application of this document. In terms of

references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 6719 Specifications for Bag House

GB/T 13931 Electrostatic Precipitator - Methods of Performance Tests

GB/T 16845 Dust Collector - Terminology

GB 19153 Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for Displacement Air Compressors

GB/T 27869 Electrostatic-fabric Integrated Precipitator

GB/T 32154 Methods of Performance Tests for Electrostatic-fabric Integrated Precipitator
DL/T 514 Electrostatic Precipitator

JB/T 5910 Electrostatic Precipitator

JB/T 11267 Top Electromagnetic Impact Rapping Type ESP

3 Terms and Definitions

What is defined in GB/T 16845, GB/T 6719 and GB/T 27869, and the following terms and definitions are applicable to this document.

3.1 Specific Power Consumption for Precipitator Specific power consumption for precipitator refers to the power consumed by precipitator in the handling of unit working conditions that contain dust and flue gas.

3.2 Minimum Allowable Values of Energy Efficiency for Precipitator Minimum allowable values of energy efficiency for precipitator refers to the maximum specific power consumption allowed by precipitator under the stipulated test conditions and when the performance reaches design requirements.

3.3 Resistance Power Consumption for Precipitator Resistance power consumption for precipitator refers to the unit time power consumption that induced draft fan needs to overcome precipitator's pressure drop.

3.4 Difficulty Level of Dedusting for Different Coal for Electrostatic Precipitator Difficulty level of dedusting for different coal for electrostatic precipitator refers to the difficulty level for electrostatic precipitator to reach the performance indexes under the given conditions, such as: coal, fly ash and flue gas composition, flue gas temperature and fly ash particle size. Its evaluation may be divided into "relatively easy", "general difficulty" and "relatively difficult".

3.5 Dust Cleaning Energy for Bag Precipitator Dust cleaning energy for bag precipitator refers to the unit time energy that bag precipitator consumes during dust cleaning.

4.1.1 Energy efficiency grades for electrostatic precipitator

4.1.1.1 Energy efficiency grades for electrostatic precipitator shall be divided into 3 grades (as it is shown in Table 1); Grade-1 signifies the highest energy efficiency. Difficulty level of dedusting for different coal is "general difficulty". When flue gas dust- containing concentration at the inlet of electrostatic precipitator is not more than 30 g/m³, the specific power consumption for various grades of electrostatic precipitator

4.2.1 Constitution of precipitator's main power consumption in unit time Electrostatic precipitator's main power consumption in unit time includes: resistance power consumption for electrostatic precipitator; power consumption of high-voltage power supply equipment in unit time for electrostatic precipitator; power consumption of low-voltage electrical equipment in unit time for electrostatic precipitator. Bag precipitator's main power consumption in unit time includes: resistance power consumption for bag precipitator; dust-cleaning power consumption for bag precipitator. Electrostatic-fabric integrated precipitator's main power consumption in unit time includes: resistance power consumption for electrostatic-fabric integrated precipitator; air compressor system's power consumption in unit time; power consumption of high- voltage power supply equipment in unit time; power consumption of insulator heater in unit time.

4.2.2 Calculation method for specific power consumption for precipitator Specific power consumption for precipitator shall be calculated in accordance with Formula (1). Where, C

---specific power consumption for precipitator, expressed in (kWh/m³); W

---power consumption for precipitator in unit time, expressed in (kWh/h); Q

---working condition flue gas amount that precipitator handles in unit time, expressed in (m³/h).

4.2.3 Calculation method for main power consumption for precipitator in unit time

4.2.3.1 Calculation method for main power consumption for electrostatic precipitator in unit time Main power consumption for electrostatic precipitator in unit time shall be calculated in accordance with Formula (2). Where, W

---electrostatic precipitator's power consumption in unit time, expressed in (kWh/h); W_r

---electrostatic precipitator's resistance power consumption, calculated in Where, q

---air compressor unit's input specific power, expressed in (kWmin/m³); L electrostatic-fabric

---gas consumption for air compression for electrostatic-fabric integrated precipitator in unit time, expressed in (m³/min). NOTE 1: air compressor's power consumption refers to unit time of power consumption that is used to generate compressed air for dust-cleaning and overcome air compressor's own efficiency. NOTE 2: air compressor unit's input specific

power shall select the energy-saving evaluation value in GB 19153.

5.1 Basic Requirements

5.1.1 The design, manufacture and quality of electrostatic precipitator shall comply with the stipulations in JB/T 5910, JB/T 11267 or DL/T 514. The design, manufacture and quality of bag precipitator shall comply with the stipulations in GB/T 6719. The design, manufacture and quality of electrostatic-fabric integrated precipitator shall comply with the stipulations in GB/T 27869.

5.1.2 Precipitator's outlet flue gas dust-containing concentration shall comply with national and local standards and requirements regarding environmental protection emission.

5.1.3 In terms of electrostatic precipitator during the operation, performance indexes, such as pressure drop and air leakage rate, shall comply with the stipulations in JB/T 5910 and JB/T 11267. In terms of bag precipitator during the operation, performance indexes, such as pressure drop and air leakage rate, shall comply with the stipulations in GB/T 6719. In terms of electrostatic-fabric integrated precipitator during the operation, performance indexes, such as pressure drop and air leakage rate, shall comply with the stipulations in GB/T 27869.