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Norm of energy consumption per unit production of dimethyl siloxane

二甲基硅氧烷单位产品能源消耗限额

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Table of Contents

Norm of energy consumption per unit production of dimethyl siloxane

1 Scope

This document specifies the grade, technical requirements, statistical scope and calculation method of the allowance of comprehensive energy consumption per unit production (referred to as energy consumption) of dimethyl siloxane.

This document is applicable to the calculation and assessment of the comprehensive energy consumption per unit production of dimethyl siloxane, as well as the energy consumption control of new (renovation, expansion) projects.

2 Normative references

The provisions of the following documents constitute the essential clauses of this document through normative references in this text. Among them, for referenced documents with dates, only the versions corresponding to the dates are applicable to this document; for referenced documents without dates, the latest versions (including all amendments) are applicable to this document.

GB/T 2589 General rules for calculation of the comprehensive energy consumption

GB/T 12723 General principles for establishing allowance of energy consumption per unit throughput

GB/T 20436 Dimethylsiloxane cyclics mixture

GB/T 23953 Dimethyldichlorosilane for industrial use

3 Terms and definitions

The terms and definitions defined in GB/T 12723 and the following apply to this document.

3.1 hydrolysate

A mixture with the main components of hydroxy-terminated polydimethylsiloxane and cyclosiloxane.

5 Technical requirements

5.1 Limit value of comprehensive energy consumption per unit production of dimethyl siloxane

The limit value of comprehensive energy consumption per unit product of existing dimethyl siloxane production enterprises shall comply with Grade 3 in Table 1.

5.2 Access value of comprehensive energy consumption per unit production of dimethyl siloxane

The access value of comprehensive energy consumption per unit product of new (expanded, renovated) dimethyl siloxane production enterprises shall comply with Grade 2 in Table 1.

6 Statistical scope and calculation method

6.1 Statistical scope of comprehensive energy consumption of dimethyl siloxane

6.1.1 The comprehensive energy consumption of dimethyl siloxane mainly includes the energy consumption of the production system, the energy consumption of the auxiliary production system and the energy consumption of the ancillary production system.

6.1.2 The energy consumption of the production system refers to the total amount of various energy actually consumed by the complete process including the silicon powder processing, monochloromethane synthesis, organosilicon monomer synthesis, organosilicon monomer distillation, organosilicon high-boiling cracking, the comprehensive utilization of dimethyldichlorosilane, dimethyldichlorosilane hydrolysis, dimethyl siloxane refining, cracking, dimethyl cyclosiloxane distillation, storage of finished dimethyl siloxane, and pre-treatment and discharge of waste liquid, waste residue and waste gas, as well as energy consumption by equipment.

6.1.3 The energy consumption of auxiliary production systems refers to the total amount of energy consumed by the processes, facilities and equipment of the production system services, including the total amount of energy consumed by the power supply, water supply, gas supply, heating, refrigeration, machine repair, instrument repair, lighting, warehouses and raw material sites within the factory, as well as safety and environmental protection facilities.

6.1.4 The energy consumption of ancillary production systems refers to the total amount of energy consumed by departments and units that provide services for production during the production process, including the total amount of energy consumed by facilities such as offices, operation rooms, lounges, changing rooms, bathhouses, central control analysis, finished product inspection and maintenance.

6.1.5 The comprehensive energy consumption of dimethyl siloxane does not include the energy consumed in the construction of infrastructure, technological transformation and other projects, as well as the energy recycled and exported during the production process.

6.2 Calculation method

6.2.1 General

The actual consumption of various fuel energies shall be converted into standard coal according to its lower heating value as received in accordance with GB/T 2589. The lower heating value of energy and the energy consumption of the energy-consumed medium shall be converted into standard coal according to the measured values or the data provided by the supply unit. If the measured values cannot be obtained, the conversion coefficient can be referred to in Appendix A and Appendix B.

6.2.2 Calculation of comprehensive energy consumption of dimethyl siloxane products

The energy consumption of dimethyl siloxane shall be calculated based on the actual measured value. The measurement readings of steam and other energy and energy-consumed medium entering the production process shall prevail.

When an enterprise purchases silicon powder and methyl chloride as raw materials for the production of organic silicon monomers, the energy consumption of the purchased raw materials is calculated by multiplying the unit energy consumption of the enterprise's current production of silicon powder and methyl chloride by the purchased volume and included in the total energy consumption. If there are no actual energy consumption monitoring conditions, the unit energy consumption of purchased methyl chloride is converted with reference to the conversion coefficient of 0.0797 tce/t, and the unit energy consumption of purchased silicon powder is converted with reference to the conversion coefficient of 0.0275 tce/t.

The comprehensive energy consumption of dimethyl siloxane products is calculated according to formula (1):

$$E = \sum_{i=1}^{n} c_i \times p_i + \sum_{j=1}^{m} e_j \times p_j + \sum_{k=1}^{l} g_k \times q_k \quad \cdots\cdots (1)$$

where:

E -- the comprehensive energy consumption of dimethyl siloxane products during the reporting period, in kilograms of standard coal (kgce);

c_i -- the physical quantity of the i-th energy consumed by the dimethyl siloxane

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