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The norm of energy consumption per unit throughput of cement products

水泥制品单位产品能源消耗限额

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The norm of energy consumption per unit throughput of cement products

1 Scope

This standard specifies the terms and definitions, norm level of energy consumption, technical requirements, energy consumption statistics, calculation methods for the norm of energy consumption per unit throughput of cement products.

This standard applies to the calculation and assessment of the energy consumption of cement product manufacturing enterprises, as well as the energy consumption control of newly built (renovated, expanded) projects.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this standard.

GB/T 2589 General principles for calculation of total production energy consumption

GB/T 4623 Circular concrete pole

GB/T 11836 Concrete and reinforced concrete sewer pipes

GB/T 11968 Autoclaved aerated concrete blocks

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

GB/T 13476 Pretensioned spun concrete piles

GB/T 15762 Autoclaved aerated concrete slab

GB 17167 General principle for equipping and managing of the measuring instrument of energy in organization of energy using

GB/T 19685 Prestressed concrete cylinder pipe

GB/T 22082 Reinforced concrete segments

GB/T 31039 Pre-tensioned prestressed centrifugal concrete shaped pile

JC/T 412.1 Fiber cement flat sheets - Part 1: Non-asbestos fiber cement flat sheets

JC/T 412.2 Fiber cement flat sheets - Part 2: Asbestos fiber cement flat sheets

JC/T 564.1 Fiber reinforced calcium silicate boards. Part 1: Non-asbestos calcium silicate boards

JC/T 564.2 Fiber reinforced calcium silicate boards - Part 2: Asbestos calcium silicate boards

JC/T 2029 Precast prestressed spun concrete square piles

3 Terms and definitions

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

3.1

Comprehensive energy consumption of cement products

During the reporting period, the total energy consumption of a certain type of cement product in the entire product production process from the entry of raw materials into the plant and the metering of energy into the process until the finished product exit-warehouse.

3.2

The comprehensive energy consumption per unit product throughput of cement products

During the reporting period, the comprehensive energy consumption of a certain type of cement product expressed in terms of the unit (per cubic meter of concrete) qualified product throughput.

3.3

The coal consumption per unit throughput of cement products

During the reporting period, the steam (or steam-producing fuel) consumption of a certain type of cement product expressed as the unit (per cubic meter) of qualified product throughput.

6.1.1.2 The calorific value of various energy sources shall be converted into a unified standard coal. The calorific value of various energy sources is based on the caloric value measured by the enterprise during the reporting period. If there are no actual measurement conditions, it shall use the reference coefficients for converting various standard energy sources as given in GB/T 2589.

6.1.1.3 The statistics and accounting of energy consumption shall include the above-mentioned various production links; it shall not be repeated or missed.

6.1.2 Classification

6.1.2.1 Precast concrete pile

The energy consumption of such products shall be subject to statistics in the entire production process of product from the entry of raw materials [cement, admixtures (fine sand, fine slag powder, silica fume, fly ash, etc.), aggregates, admixtures, PC steel rods, end plates, pile ferrules, steel bars (hot-rolled wire rod, cold-drawn wire, etc.) etc.] into factory and the including of energy into the procedure through metering, to the exit-warehouse of metered finished product.

6.1.2.2 Circular concrete pole

The energy consumption of such products shall be subject to statistics in the entire production process of product from the entry of raw materials [cement, admixtures (fine sand, silica fume, etc.), aggregates, additives, flanges, steel bars (pre-tensioned bars, hot-rolled wire rod, cold-drawn wire, etc.) etc.] into factory and the including of energy into the procedure through metering, to the exit-warehouse of metered finished product.

6.1.2.3 Concrete and reinforced concrete sewer pipes

The energy consumption of such products shall be subject to statistics in the entire production process of product from the entry of raw materials [cement, aggregates, additives, steel bars (hot-rolled wire rod, cold-drawn wire, etc.) etc.] into factory and the including of energy into the procedure through metering, to the exit-warehouse of metered finished product.

6.1.2.4 Prestressed steel tube concrete pipe

The energy consumption of such products shall be subject to statistics in the entire production process of product from the entry of raw materials [cement, aggregate, admixtures, steel plates (including socket rings and plug rings), steel bars (prestressed steel bars, hot-rolled wire rods, cold-drawn wires, etc.), etc.] into factory and the including of energy into the procedure through metering, to the exit-warehouse of metered finished product.

6.1.2.5 Aerated concrete

Where:

E - Comprehensive energy consumption of a certain type of cement product throughput during the reporting period, in kilograms of standard coal (kgce);

e_i - The physical quantity of the i-th energy consumed by a certain type of cement product during the reporting period, in kilograms (kg);

ρ_i - The converted standard coal coefficient of the i-th energy source;

n - Number of energy types consumed.

6.3.3 Comprehensive energy consumption per unit throughput of cement product

The comprehensive energy consumption per unit throughput of cement product is calculated according to formula (2), among which the coal consumption per unit of cement product throughput in cold regions shall be corrected according to the calculation method of 6.3.4.

$$E_g = E/G \qquad \cdots\cdots(2)$$

Where:

E_g - The comprehensive energy consumption per unit throughput of a certain type of cement product during the reporting period (converted into energy consumption per cubic meter, expressed in the form of standard coal consumption), in kilogram standard coal per cubic meter (kgce/m^3);

G - Throughput of qualified products of a certain type of cement products during the reporting period (converted to cubic meters), in cubic meters (m^3).

6.3.4 Correction of coal consumption per unit throughput of cement products in cold regions

6.3.4.1 The corrected value of coal consumption per unit throughput of cement products in cold regions in winter is determined according to formula (3):

$$E'_{gM} = \left(\frac{E'_M}{G'}\right) \div f \qquad \cdots\cdots(3)$$

Where:

E'_{gM} - Corrected value of coal consumption per unit throughput of cement products in cold regions in winter, in kilogram standard coal per cubic meter (kgce/m^3);

E'_M - The actual coal consumption value of a certain type of cement product in winter in cold regions, in kilogram (kg);

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