NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

GB/T 33650-2017

Technical Requirement of Energy Consumption Evaluation for Cement Manufacturing

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Foreword

This Standard was drafted as per the rules specified in GB/T 1.1-2009.

This Standard was proposed by China Building Material Federation.

This Standard shall be under the jurisdiction of Building Material Industry Energy Management Subcommittee of National Technical Committee for Standardization of Energy Infrastructure and Management (SAC/TC 20/SC 10).

Drafting organizations of this Standard. Sinoma International Engineering Co., Ltd., Beijing Guojian Lianxin Attestation Center Co., Ltd., and Beijing University of Technology.

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Technical Requirement of Energy Consumption

Evaluation for Cement Manufacturing

1 Scope

This Standard specifies the terms and definitions, evaluation conditions and range, evaluation index system and index requirements, calculation methods and evaluation report of energy consumption evaluation for cement manufacturing.

This Standard is applicable to the energy consumption evaluation for common Portland cement and clinker manufacturing process.

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 document.

GB/T 3485 Technical Guides for Evaluating the Rationality of Electricity Usage in Industrial Enterprise

GB 17167 General Principle for Equipping and Managing of the Measuring Instrument of Energy in Organization of Energy Using

GB/T 23331 Management System for Energy - Requirements

GB/T 24851 Specification for Equipping and Managing of Measuring Instrument of Energy in Building Material Industry

GB/T 26281 Calculating Methods for Heat Balance, Heat Efficiency and Comprehensive Energy Consumption of Cement Rotary Kiln

GB/T 26282 Measuring Methods of Heat Balance of Cement Rotary Kiln

GB/T 27977 Test and Calculation Methods of Electricity Efficiency of Cement Production

GB/T 33652-2017 Technical Regulation of Energy Consumption Test for Cement Manufacturing

6.1 Calculation method of cogeneration energy consumption ratio

The calculation of cogeneration energy consumption ratio can refer to Formula (1).

Where.

etafd - cogeneration energy consumption ratio;

0.1229 - power conversion coefficient of standard coal (equivalent coefficient);

beta - electricity generation per ton clinker; in kW-h/t;

ecl - comprehensive coal consumption of clinker, in kgce/t.

6.2 Calculation method of second-level index weight for energy consumption evaluation on different types of production lines

6.2.1 Confirmation of second-level index weight for energy consumption evaluation on the cement production line

The second-level index weight ac1 for energy consumption evaluation on cement production line can refer to Table 1.

6.2.2 Calculation method of second-level index weight for energy consumption evaluation on the clinker production line

The second-level items for energy consumption evaluation on the clinker production line include crude fuel pre-treatment, raw meal preparation, fuel preparation, clinker burning, cogeneration and auxiliary production system.

The calculation of energy consumption evaluation on clinker production line can refer to Formula (2).

Where.

ac2 - second-level index weight for energy consumption evaluation on clinker production line;

ac1 - second-level index weight for energy consumption evaluation on cement production line, see Table 1;

the calculation method can refer to Table 3.

Table 3 -- Energy Consumption Index Calculation Score Form

6.3.3 Calculation for assessment score of single second-level evaluation index in cement manufacturing enterprise

The second-level index in the evaluation index for cement manufacturing enterprise is based on the data that is actually reached by the enterprise during the assessing period; the calculation can refer to Formula (4).

Where.

Pi - assessment score or second-level evaluation index of the ith item;

ai - weight value of second-level evaluation index of the ith item;

Sij - the score corresponding to different classes in the second-level index of ith item (j is corresponding to Class-A, Class-B, or Class-C)

6.4 Calculation of energy consumption comprehensive evaluation value for cement manufacturing

The calculation of comprehensive evaluation value can refer to Formula (5).

Where.

P - energy consumption comprehensive evaluation value of the enterprise, with 0~100;

Pi - assessment score of the second-level index of the ith item;

n - the total number of second-level indexes participating in the assessment.

Manufacturing Situation Class-A Class-B Class-C Class-C Below Corresponding score Sij

Positive index

Reverse index

NOTE. Xi is the actual value for the evaluation index of the ith item;

Bmax(i) indicates the maximum value in the Class-B benchmark range of the ith item index; Bmin(i) indicates the minimum value in the Class-B benchmark range of the ith item index;

Cmax(i) indicates the maximum value in the Class-C benchmark range of the ith item index; Cmin(i) indicates the minimum value in the Class-C benchmark range of the ith item index.

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