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

GB 29436.1-2012

**The norm of energy consumption per unit product of methanol -
Part 1: Coal to methanol**

甲醇单位产品能源消耗限额 第1部分：煤制甲醇

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Foreword Foreword

The foreword states that 4.1 and 4.2 of this part are mandatory and that the remaining provisions are recommended, and that the part was drafted according to the rules given in GB/T 1.1-2009.

GB 29436, Norm of energy consumption per unit product of methanol, is divided into four parts: Part 1, Coal to methanol; Part 2, Natural gas to methanol; Part 3, Methanol co-produced with synthetic ammonia; Part 4, Coke oven gas to methanol. This document is Part 1.

The part was proposed by the Department of Resource Conservation and Environmental Protection of the National Development and Reform Commission, and is under the joint administration of the National Technical Committee on Energy Fundamentals and Management of Standardization (SAC/TC 20) and the National Technical Committee on Coal Standardization (SAC/TC 42).

1 Scope

This part of GB 29436 lays down the requirements, the statistical boundary, the calculation

method and the energy-saving management and measures for the energy consumption per unit product of methanol produced from coal as raw material (hereinafter referred to as energy consumption).

This part applies to the calculation and the assessment of the energy consumption per unit product of enterprises that produce methanol from coal, and to the control of the energy consumption of newly built projects.

2 Normative references

The documents listed below are indispensable for the application of this document. For dated references, only the edition cited applies; for undated references, the latest edition, including all amendments, applies.

GB/T 2589 General principles for calculation of the total energy consumption; GB/T 3484 General principles of energy balance for enterprise; GB/T 5751 Chinese classification of coals; GB/T 12497 Economical operation for three-phase induction motors; GB/T 13462 Economical operation for power transformers; GB/T 13466 General principles for economical operation of alternating current drive fan (pump, compressor) systems; GB 17167 General principle for equipping and managing of the measuring instrument of energy in organization of energy using.

3 Terms and definitions

3.1 Total energy consumption of methanol production. Within the reporting period, the sum of all the forms of energy consumed in producing methanol. Its value is equal to the sum of all the forms of energy input into the methanol production process during the reporting period, minus the sum of all the forms of energy exported to the outside.

3.2 Total energy consumption per unit product of methanol. The total energy consumption of the methanol product expressed per unit of output.

4 Technical requirements

4.1 The energy consumption per unit product of existing coal-to-methanol production enterprises shall meet the requirements of Table 1. Table 1 has two columns, raw coal type and total energy consumption per unit product in kgce/t, and three rows: lignite, not more than 2 400; bituminous coal, not more than 2 200; anthracite, not more than 1 800. A footnote to the table states that the classification of the raw coal follows GB/T 5751.

4.2 The energy consumption per unit product of newly built coal-to-methanol production enterprises shall meet the access values of Table 2, which is built in the same way as Table 1: lignite, not more than 2 000; bituminous coal, not more than 1 800; anthracite, not more than 1 600, all in kgce/t, with the same footnote referring to GB/T 5751.

4.3 The advanced values of the energy consumption per unit product of coal-to-methanol production enterprises shall meet Table 3, again with the same two columns and three rows: lignite, not more than 1 900; bituminous coal, not more than 1 700; anthracite, not more than 1 500, in kgce/t, with the footnote referring to GB/T 5751.

5 Statistical boundary and calculation method

5.1.1 The energy input to methanol production covers the primary energy (raw coal, oil, natural gas and the like) and the secondary energy (electricity, heat, petroleum products, coke, gas and the like) consumed by the production system, the auxiliary production system and the ancillary production system, together with the energy consumed by the working media used in production (water, oxygen, compressed air and the like). It does not cover the energy used for construction and reconstruction, nor domestic energy use, which means use for dormitories, schools, culture and entertainment, medical care, commercial services and nursery education inside the enterprise. The production system mainly includes raw coal preparation, gasification, shift conversion, purification, methanol synthesis and methanol distillation; the auxiliary production system mainly includes the preparation of the gasifying agent (oxygen, oxygen-enriched air, air and steam), the water treatment and circulating cooling water system, the heat supply system and instrument control; the ancillary production system mainly includes the treatment of the three wastes, machine repair and electrical repair.

5.1.2 The exported energy of methanol means the energy exported by the methanol system to the outside. Energy contained in the waste gas, waste liquid and waste residue produced by the methanol production system that is not recovered and used, that is not metered, that has no measured calorific value, or that is not used as energy, for example when it is used directly for road building or house building, shall not be counted as exported energy.

5.1.3 The energy consumed for crude methanol supplied to the outside, including crude methanol sold and crude methanol supplied directly to downstream production without distillation, and the energy consumed in processing purchased crude methanol into refined methanol, shall be deducted from the input energy; the resulting exported energy shall likewise be deducted from the total exported energy of methanol.

5.1.4 Energy recovered and reused in methanol production shall not be counted as input energy when it is used inside the system. When it is exported to an outside system it shall be counted as exported energy of methanol. When furnace slag, synthesis purge gas, methanol tank vent gas, sulfur, coal tar, by-product steam and the like are exported to an outside system, they shall not be converted into standard coal and deducted from the input energy, but shall be counted in the exported energy of methanol.

5.1.5 The energy consumed by the safety and environmental protection measures that methanol production requires, such as sulfur recovery, oil recovery and sewage treatment, shall be counted in the energy consumption of methanol.

5.1.6 The consumption of raw materials and utilities shared by several users, such as steam and energy-consuming working media, shall be apportioned reasonably according to the relevant provisions.

5.1.7 The energy consumed by major overhauls and storage losses shall be apportioned by month.

5.2.1 The total energy consumption of methanol is calculated with formula (1). The formula is printed as a difference between two summations and is not reproduced here. Its legend is: E , total energy consumption of methanol, in kilograms of standard coal (kgce); n , number of kinds of energy input; E with subscript i , physical quantity of the i -th kind of energy input during methanol production, in tonnes (t), kilowatt hours (kW.h) or cubic metres; k with subscript i , standard coal conversion factor of the i -th kind of energy input, in kilograms of standard coal per tonne (kgce/t), kilograms of standard coal per kilowatt hour or kilograms of standard coal per cubic metre; m , number of kinds of energy exported; E with subscript j , physical quantity of the j -th kind of energy exported during methanol production, in the same units; k with subscript j , standard coal conversion factor of the j -th kind of energy exported, in the same units. A note refers to annex A for the calculation of the individual input and output energy quantities of methanol.

5.2.2 The calculation method for methanol output is given in annex B.

5.2.3 The total energy consumption per unit product of methanol is calculated with formula (2), printed as the ratio of two quantities and not reproduced here. Its legend is: e , total energy consumption per unit product of methanol, in kilograms of standard coal per tonne (kgce/t); E , total energy consumption of methanol in the reporting period, in kilograms of standard coal (kgce); P , methanol output in the reporting period, in tonnes (t).

5.2.4 The standard coal conversion factors of the various forms of energy shall be based on the calorific values measured by the enterprise during the reporting period, and each form of energy shall be converted to standard coal from its measured value according to GB/T 2589.

6 Energy-saving management and measures

6.1.1 An energy management organisation shall be set up and kept in working order, to organise, manage, supervise, assess and evaluate the energy-saving work.

6.1.2 Workable energy-saving rules and measures shall be laid down, responsibility shall be reinforced, and a system for assessing energy-saving responsibility shall be established and kept in working order.

6.1.3 The enterprise shall equip and use energy measuring instruments and apparatus in accordance with GB 17167, so that the metering equipment is in good condition, and shall carry out effective detection, measurement and calculation of the basic data, so that the