ICS 27.010
CCS F01

NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB 31830-2024

Replacing GB 31828-2015

Norm of energy consumption per unit production of toluene diisocyanate and diphenyl methane diisocyanate

甲苯二异氰酸酯和二苯基甲烷二异氰酸酯单位产品能源消耗限额

Issued on: April 29, 2024 **Implemented on: May 1, 2025**

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

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1 Scope

GB 31830-2024 is the Chinese national standard on norm of energy consumption per unit production of toluene diisocyanate and diphenyl methane diisocyanate, 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 29 April 2024 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 May 2025. 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 Document specifies the norm levels, technical requirements, and statistical range of energy consumption per unit production (abbreviated as energy consumption) of toluene diisocyanate (TDI) and diphenyl methane diisocyanate (MDI); and describes the calculation method for them. This Document is applicable to the calculation and assessment of energy consumption per unit production of TDI produced with dinitrotoluene (DNT), hydrogen, chlorine, and carbon monoxide as raw materials, and MDI produced with aniline, formaldehyde, chlorine, and carbon monoxide as raw materials, as well as energy consumption control for new construction and renovation and expansion projects.

2 Normative References

The provisions in following documents become the essential provisions of this Document through reference in 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) is applicable to this Document.

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

GB/T 12723 General principles of stipulation of energy consumption norm for unit product

GB/T 13941 Diphenylmethane diisocyanate

GB/T 32469 Plastics - Polyurethane raw materials - Toluene diisocyanate

3 Terms and Definitions

For the purposes of this Document, the terms and definitions given in GB/T 12723 and the following apply.

3.1 Comprehensive energy consumption of toluene diisocyanate product During the reporting period, the total amount of various energy actually consumed in the entire production process of TDI product.

6.1.1 The comprehensive energy consumption of TDI and MDI products includes various primary energy (raw coal, oil, natural gas, etc.), secondary energy (electricity, heat, petroleum products, coke, gas, etc.) consumed by the production system, auxiliary production system and affiliated production system; and energy-consumed mediums used in production (energy consumed by water, oxygen, compressed air, etc.); excluding energy used in the construction and renovation process and living energy (referring to the energy used in dormitories, schools, cultural entertainment, medical care, commercial services and childcare and early childhood education within the enterprise system).

6.1.2 Energy consumption of TDI and MDI production systems are as follows:

a) Energy consumption of TDI production system includes. Various energy consumption, using DNT, hydrogen, chlorine, carbon monoxide as raw materials, through hydrogenation unit, phosgene synthesis unit, phosgenation unit, distillation unit to TDI product entering finished product tank and sending out by-product hydrogen chloride gas.

b) Energy consumption of MDI production system includes. Various energy consumption, using aniline, formaldehyde, chlorine, carbon monoxide as raw materials, through condensation unit, phosgene synthesis unit, phosgenation unit, separation unit to finished MDI tank area and waste liquid, waste residue, waste gas are sent out after pretreatment.

6.1.3 Energy consumption of auxiliary production system includes. Energy consumption of power supply, machine repair, water supply, gas supply, heating, refrigeration, instrument repair, lighting, warehouse and raw material site in the factory, as well as for safety, environmental protection (waste liquid, waste residue, waste gas are sent out after pretreatment), energy saving and other devices that facilities serving the production system.

6.1.4 Energy consumption of auxiliary production system includes. Energy consumption of dispatch room, office, operation room, control room, lounge, dressing room, bathhouse,

central control analysis, product inspection, maintenance section and other facilities specially configured for the production system.

6.1.5 The waste heat, waste energy and chemical reaction heat generated in the recycling and utilization production process of TDI and MDI are not included in the energy consumption. If the waste heat, waste energy and chemical reaction heat are used by other devices outside the statistical range of 6.1.2 ~ 6.1.4, they shall be deducted from the system according to the actually used energy.

6.1.6 The statistics and accounting of energy consumption shall include all production links and systems; and shall neither be repeated nor omitted. The energy consumed by routine overhaul and storage loss shall be included in the energy consumption of the production system.

6.2 Calculation method

6.2.1 The calculation of comprehensive energy consumption shall comply with the provisions of GB/T 2589.

6.2.2 The calorific value of various energy sources shall be converted into a unified unit of measurement, kilograms of standard coal (kgce). The calorific value of various energy sources shall be based on the actual measured value of the enterprise during the reporting period. If there is no actual measurement condition, the reference coefficients of various energy sources for standard coal conversion given in Appendixes A or B may be used for conversion.

6.2.3 The outsourced steam shall be converted into standard coal according to the enthalpy value of the purchased steam.

6.2.4 The output of TDI and MDI products shall be the physical quantity of qualified products. TDI products shall meet the quality requirements of GB/T 32469; and qualified MDI products shall meet the quality requirements of GB/T 13941.