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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB 31823-2021

The norm of energy consumption per unit throughout of terminal operation

码头作业单位产品能源消耗限额

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1 Scope

GB 31823-2021 is the Chinese national standard on the norm of energy consumption per unit throughout of terminal operation, 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 11 October 2021 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 November 2022. 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 stipulates the energy consumption norm grade, technical requirements, calculation scope and calculation method of the norm of energy consumption per unit throughout of specialized container terminal, dry bulk (coal, ore) terminal and crude oil terminal operation. This document applies to the calculation and assessment of energy consumption of production operation in domestic container terminals, dry bulk (coal, ore) terminals, and crude oil terminals, as well as the energy consumption control of newly-built, rebuilt, and expanded container terminals, dry bulk (coal, ore) terminals, and crude oil terminals, where the specialized container terminals do not include automated container

terminals; crude oil terminals include single terminals engaged in crude oil loading and unloading operations and terminals mainly engaged in crude oil loading and unloading operations with a crude oil throughput ratio of more than 50%, and exclude the back-up supporting reservoir area of the crude oil terminal.

2 Normative references

The contents of the following documents constitute the indispensable clauses of this document through normative references in the text. For dated references, only the version corresponding to that date is applicable to this document; for undated references, the latest version (including all amendments) is applicable to this document.

GB/T 2589-2020, General rules for calculation of the comprehensive energy consumption

GB/T 8487, Terms for cargo handling in port

GB/T 12723-2013, General principles for establishing allowance of energy consumption per unit throughput

GB 50189, Design standard for energy efficiency of public buildings JTS 150, Code of energy-saving design for port and waterway engineering

5.2 Access value of energy consumption per unit throughput of terminal operation The comparable comprehensive energy consumption for per unit throughout of newly-built, renovated and expanded terminal operation shall not be greater than grade 2 of allowance of energy consumption in Table 1.

6.1.1 Calculation scope

6.1.1.1 The energy consumption of production operations in the container terminal port area includes two parts: energy consumption of handling production and energy consumption of auxiliary production.

6.1.1.2 The energy consumption of handling production includes all operation links of container terminal handling, storage operation, horizontal transport and on-site lighting. If part of the operation link is undertaken by the outsourcing unit, the energy consumption of this link shall be included in the statistics according to the actual energy consumption; if statistics are not available, the calculation shall be based on the handling volume and the recommended value of equipment unit energy consumption indicator in JTS 150 (refer to the calculation for inland ports).

6.1.1.3 The energy consumption of auxiliary production refers to the energy consumption that directly services the handling production, including the following items:

a) Purchased new water: refer to Appendix A for its standard coal coefficient;

b) Energy consumption of auxiliary production: the energy consumed by auxiliary

production processes such as sewage treatment, water supply and drainage, environmental protection, waiting buildings, production and office buildings, and machine repairs in the port area. If part of the auxiliary production operation is undertaken by the outsourcing unit, the energy consumption of this part shall be included in the statistics according to the actual energy consumption. The energy consumption of auxiliary production includes neither the total energy consumption of enterprises engaged in industrial production, catering, tourism, real estate, and other businesses that have nothing to do with port production or the total energy consumption of life, nor energy consumption of refrigerated containers, port vehicles and ships, railway locomotive

6.2.1.2 The energy consumption of handling production includes all operation links of dry bulk terminal handling, storage yard operation, horizontal transport, car loading/discharging operation and on-site lighting. If part of the operation link is undertaken by the outsourcing unit, the energy consumption of this link shall be included in the statistics according to the actual energy consumption; if statistics are not available, the calculation shall be based on the handling volume and the recommended value of equipment unit energy consumption indicator in JTS 150 (refer to the calculation for inland ports).

6.2.1.3 The energy consumption of auxiliary production refers to the energy consumption that directly serves the handling production, including the following items:

a) Purchased new water: refer to Appendix A for its standard coal coefficient;

b) Energy consumption of auxiliary production: the energy consumed by auxiliary production processes such as sewage treatment, water supply and drainage, environmental protection, dust removal, waiting buildings, production and office buildings, and machine repairs in the port area. If part of the auxiliary production operation is undertaken by the outsourcing unit, the energy consumption of this part shall be included in the statistics according to the actual energy consumption. The energy consumption of auxiliary production includes NEITHER the total energy consumption of enterprises engaged in industrial production, catering, tourism, real estate, and other businesses that have nothing to do with port production or the total energy consumption of life, NOR energy consumption of port vehicles and ships, railway locomotive transportation in the field, back-up freight cars, logistics companies, maintenance of port facilities.

6.2.1.4 The loss of electric energy in the process of internal transmission of the enterprise shall be included in the comprehensive energy consumption of production.

6.2.1.5 Various energy sources are converted into standard coal according to the actual calorific value (29 270 MJ calorific value is equivalent to 1 tce). If there is no actual measurement condition, the coefficients given in Appendix A can be used to convert into standard coal.

6.2.2 Calculation method

6.2.2.1 The comprehensive energy consumption for per unit throughout of dry bulk terminal operation is calculated according to Formula (4):

6.3.1 Calculation scope

6.3.1.1 The total energy consumption of production in the crude oil terminal includes two parts: energy consumption of handling production and energy consumption of auxiliary production.

6.3.1.2 The energy consumption of handling production includes cargo handling operations and on-site production lighting. The main energy-consuming equipment includes oil transfer arms, boarding ladders, process electric valves, vent pumps, quick disconnect hooks and production lighting lamps, etc., and excludes ship pumps.

6.3.1.3 Energy consumption of auxiliary production refers to the energy consumption that directly serves the handling production, INCLUDING energy consumed in pipeline heating, nitrogen production, water supply and drainage and sewage treatment, environmental protection, waiting buildings, terminal production and office buildings, machine repairs and other auxiliary production processes, and purchased energy-consuming working fluids (such as new water, nitrogen), EXCLUDING energy consumption of emergency firefighting equipment, port vehicles and ships, railway locomotive transportation in the yard, back-up freight cars, logistics companies, port facility maintenance, or business or life energy consumption that has nothing to do with production operations of the crude oil terminal.

6.3.1.4 The loss of electric energy in the process of internal transmission of the enterprise shall be included in the comprehensive energy consumption of production.

6.3.1.5 Various energy sources and energy-consuming working fluids are converted into standard coal according to the actual calorific value (29 270 MJ calorific value is equivalent to 1 tce). If there is no actual measurement condition, the coefficients given in Appendix A can be used to convert into standard coal.

6.3.2 Calculation method

6.3.2.1 The comparable comprehensive energy consumption for per unit throughout of crude oil terminal operation is calculated according to Formula (8): Where: ek - comparable comprehensive energy consumption for per unit throughout of crude oil terminal operation, in tons of standard coal equivalent per 10 000 tons (tce/104 t); Ez - energy consumption of handling production of crude oil terminal, in tons of standard coal equivalent (tce); Ef - energy consumption of auxiliary production of crude oil terminal, in tons of standard coal equivalent (tce); T - throughput of the crude oil terminal, in 10 000 tons (104 t).

6.3.2.2 The energy consumption of handling production of crude oil terminal is calculated according to Formula (9): Where: Ezi - the physical quantity of a certain energy consumed in the handling production of the crude oil terminal, in physical quantities such as tons (t) or