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GB/T 46633-2025

**Earth-moving machinery - Evaluation method for the
operational energy efficiency of excavators**

土方机械 挖掘机运行能效评价方法

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1.Structure and Drafting Rules of Standardization Documents". Drafting. Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents. This document was proposed by the China Machinery Industry Federation. This document was prepared by the National Technical Committee on Standardization of Earthmoving Machinery (SAC/TC334) and the National Technical Committee on Standardization of Green Manufacturing Technology. (SAC/TC337) jointly under the jurisdiction of the State Administration of Taxation. This document was drafted by: China Machinery Productivity Promotion Center Co., Ltd., Xuzhou XCMG Excavating Machinery Co., Ltd., and Jiangsu XCMG Construction Machinery. Research Institute Co., Ltd., Chongqing Technology and Business University, Tianjin Engineering Machinery Research Institute Co., Ltd., Jiangsu Huizhi High-end Engineering Machinery Innovation Center Co., Ltd. The company, Xingtai Zhongwei Zhuote Hydraulic Technology Co., Ltd., Chongqing University, Jiangsu XCMG National Heavy Machinery Laboratory Technology Co., Ltd., and China Railway 19th Bureau Group. Limited Liability Company, Hebei Beijing-Tianjin-Hebei Remanufacturing Industry Technology Research Co., Ltd., China Railway Construction Engineering Group Fourth Construction Co., Ltd., Hefei University of Technology China Railway Construction Group East China Construction Co., Ltd., Shenzhen Huian Luyuan Construction Engineering Co., Ltd., and Ningde Municipal Institute of Standardization Science and Technology. The main drafters of this document are. Sun Tingting, Lü Lei, Song Tianjia, Tuo Junbo, Li Guangqing, Chen Xinchun, Jia Jinwei, Li Congbo, Yao Teng, and Xu Yuhong. Wang Canyang, Bian Hongming, Huang Haihong, Li Xiukui, Huang Wenzhi, Li Haiyi, Xu Yubing, Li Lei, Wang Guoqi, Li Yu,

Lin Ying. Energy efficiency evaluation method for earthmoving machinery excavators

1 Scope

GB/T 46633-2025 is the Chinese national standard covering how much fuel an excavator burns for the work it does - the standard duty cycle, the volume of material moved per litre, the measurement conditions, and the grading that lets two machines be compared honestly. First edition, in force from 1 May 2026. Issued on 31 October 2025, it has been in force since 1 May 2026.

This document establishes evaluation indicators for the operational energy efficiency of hydraulic excavators used in earthmoving machinery, and describes the calculation methods and evaluation process for these indicators. This document applies to the operational energy efficiency evaluation of hydraulic excavators powered by internal combustion engines. Hydraulic excavators with other power sources can refer to this document. use.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 6572 Earthmoving Machinery - Hydraulic Excavators. Terminology and Commercial Specifications

GB/T 44049 Basic Data Testing and Calculation Methods for Energy Consumption in the Operation of Engineering Machinery

3 Terms and Definitions

The terms and definitions defined in GB/T 6572 and GB/T 44049, as well as the following terms and definitions, apply to this document.

3.1 The ratio between the energy, service, or performance output by an excavator during its service life and the energy input when it completes a specific task.

Note. Both inputs and outputs need to be described in detail in terms of quantity and quality, and must be measurable.

3.2 The energy consumed by an excavator during its service life to complete specific tasks.

Note. Operating energy consumption consists of standby energy consumption, no-load energy consumption, and load energy consumption.

4 Evaluation Indicators

4.1 The energy efficiency evaluation index for excavator operation consists of individual evaluation indexes and comprehensive evaluation indexes, as shown in Table 1.

4.2 Individual evaluation indicators are used to describe the proportion of energy consumption in a single state during excavator operation, including standby energy consumption ratio and no-load energy consumption. Energy consumption ratio, load energy consumption ratio.

4.3 Comprehensive evaluation indicators are used to describe the operational energy efficiency of excavators throughout the entire operation process, including no-load and loaded operations, encompassing energy consumption per unit time and energy consumption per unit of work. Energy consumption and energy utilization rate.