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GB/T 43656-2024

**Test methods for energy consumption during welding
processing**

焊接加工能耗检测方法

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part

1. Structure and drafting rules for standardization documents" Drafting. Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents. This document was proposed and coordinated by the National Green Manufacturing Technology Standardization Technical Committee (SAC/TC337). This document was drafted by: Zhengzhou Machinery Research Institute Co., Ltd., Beijing Boqing Technology Co., Ltd., China Machinery Productivity Promotion Center Co., Ltd. China Machinery Engineering Institute Group Harbin Welding Research Institute Co., Ltd., CRRC Qingdao Sifang Locomotive and Rolling Stock Co., Ltd., Shenzhen Magnetron Co., Ltd. Mitt Welding Technology Co., Ltd., Guangdong Xinquanli Laser Intelligent Equipment Co., Ltd., China Welding Association, Hebei Chuangli Electromechanical Technology Co., Ltd. Company, China National Heavy Duty Truck Group Jinan Power Co., Ltd., Heilongjiang University of Science and Technology, Anhui Boqing Automation Technology Co., Ltd., Shanghai Engineering Technology University, Shanghai Mocheng Information Technology Co., Ltd., Tianjin Special Equipment Supervision and Inspection Technology Research Institute, Nanchang Hangkong University, Hefei University of Technology University of Water Resources and Hydropower, North China University of Water Resources and Hydropower, CRRC Nanjing Puzhen Co., Ltd., Nanjing Estun Electric Co., Ltd., Changchun CRRC Railway Vehicle Technology Co., Ltd. Development Co., Ltd., Hejian Ruichuang Testing Technology Co., Ltd., China Coal Beijing Coal Mine Machinery Co., Ltd., State-owned Sichuan West Machinery Factory, Zhonghuan United (Beijing) Certification Center Co., Ltd., China Construction Installation Group Co., Ltd. The main drafters of this document are.

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1 Scope

GB/T 43656-2024 gives the methods for measuring the energy a welding operation consumes. Welding is one of the larger electricity loads in Chinese manufacturing and one of the least measured, because the consumption of a single machine varies with the process, the duty cycle, the idle time and the auxiliary equipment, and because there has been no agreed unit against which to compare a resistance welder with a laser welder. The standard fixes that by defining the energy consumption per unit of weld - per unit length, area or joint according to the process - and the conversion factors that make the processes comparable. It sets the general requirements, the requirements on the measuring equipment, the scope and types of energy consumption to be counted, the detection and calculation methods, and the test report, with informative annexes giving the conversion factors for pressure welding, friction welding and brazing units and worked calculation examples for laser wire welding and induction brazing. It took effect on 1 July 2024.

This document specifies the general requirements for energy consumption testing during the processing of welding methods such as fusion welding, pressure welding and brazing, as well as the requirements for testing instruments. Requirements, energy consumption test scope and types, test and calculation methods and test reports. This document is applicable to the detection of energy consumption during the processing (including no-load and welding) of welding methods such as fusion welding, pressure welding and brazing. The welding method can be implemented as a reference. The energy consumption test does not include the energy consumed by preheating before welding and heat treatment after welding.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document.

GB/T 156 Standard Voltage

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

GB/T 2900.22 Electrical terminology - Electric welding machine

GB/T 3375 Welding terminology

GB 9448 Welding and cutting safety

GB 17167-2006 General rules for the allocation and management of energy metering instruments for energy-consuming units

GB/T 32201 Gas Flow Meter

GB/T 39751-2021 Guidelines for energy consumption detection methods for equipment manufacturing systems

3 Terms and definitions

Terms and definitions defined in GB/T 2589-2020, GB/T 2900.22, GB/T 3375 and GB/T 39751-2021 and the following Applicable to this document.

3.1 Welding processing weldingprocessing The welding equipment operator uses the welding equipment to complete the welding process of a certain workpiece.

3.2 No-load condition The state when the external welding circuit is open.

3.3 welding condition welding condition The welding equipment is in operation during welding processing.

3.4 No-load power The input power of the welding equipment when it is in no-load state.