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

GB 28736-2019

Replacing GB 28736-2012

**Minimum allowable values of energy efficiency and energy
efficiency grades for welding machines**

电焊机能效限定值及能效等级

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Foreword

This Standard was drafted in accordance with the rules given in GB/T 1.1-2009. This Standard replaces GB 28736-2012 "Minimum allowable values of energy efficiency and energy efficiency grades for arc welding machines". Compared with GB 28736-2012, in addition to editorial modifications, the main technical changes are as follows: -- added the term and definition of minimum allowable values of energy efficiency for welding machines (see 3.1); -- added the energy efficiency grades of resistance welding machine (see Table 7 ~ Table 10 of Clause 5); -- added the test methods (see Clause 6). This Standard was proposed by and shall be under the jurisdiction of Standardization Administration of the People's Republic of China. The drafting organizations of this Standard. China National Institute of Standardization, Chengdu Sanfang Electric Co., Ltd., Tangshan Kaiyuan Electric Group Co., Ltd., Shenzhen Jiashi Technology Co., Ltd., Shanghai Hugong Welding Group Co., Ltd., Shenzhen Ruiling Industrial Co., Ltd., Hangzhou Kaierda Welding Machine Co., Ltd., Shenzhen Hongbai Technology Industrial Co., Ltd., Shanghai General Electric Welding Machine Co., Ltd., Tianjin Seven Institute of Technology, Shenzhen Megmit Electric Co., Ltd., Zhejiang Kende Mechanical & Electrical Co., Ltd., Ohara (Nanjing) Electromechanical Co., Ltd., Shanghai Weiteli Welding Equipment Manufacturing Co., Ltd., Chengdu Welding Technology Co., Ltd., Dongguan Pengyu Weigao Intelligent Technology Co., Ltd., Ningxia Wuzhong Haoyun Electric Welder Co., Ltd., Jiangsu Zhenan Equipment Technology Co., Ltd., Yongkang Jiaxiao Welding Automation Equipment Co., Ltd., Jinzhou Shenghe Technology Electronics Co., Ltd., Hunan Chuen Information Technology Co., Ltd. Main drafters of this Standard. Liu Ren, Yang Qingxun, Su Dong, Chen Jie, Luo Weihong, Shu Zhenyu, Wang Wei, Hou Runshi, Han Peiwen, Wang Jincheng, Zhu Xuanhui, Zhao Zhongqiu, He Zhijun, Zhang Zuwang, Liu Qun, Yang Guang, Liu Xingwei, Zhou Yin, Li Feng, Cheng Haojian, Xia Jifu, Chen Jia. Version of standard substituted by this Standard is. - GB 28736-2012. Minimum allowable values of energy efficiency and energy efficiency grades

for welding machine

1 Scope

GB 28736-2019 is the Chinese national standard on minimum allowable values of energy efficiency and energy efficiency grades for welding machines, 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 31 December 2019 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 July 2020. 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 Standard specifies the energy efficiency grades, minimum allowable values of energy efficiency and test methods for arc welding machine and resistance welding machine. This Standard is applicable to the arc welding machine and resistance welding machine that are designed for industrial and professional use, not exceeding the voltage specified in GB/T 156. The resistance welding machine to which this Standard applies specifically refers to the resistance welding transformer which is finally installed with the frame, the input circuit and the secondary circuit. This Standard is not applicable to AC TIG arc welding machine, AC and DC TIG arc welding machine, power frequency secondary rectification resistance welding machine, seam welding machine, resistance butt welding machine, flash butt welding machine, energy storage resistance welding machine, inverter AC resistance welding machine, separately-sold resistance welding transformer and mechanical equipment driven welding machine.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 156, Standard Voltages

GB/T 2900.22, Electrotechnical terminology - Electric welding machine

GB/T 8118, The general specification for arc welding machines

GB/T 8366, Resistance welding - Resistance welding equipment - Mechanical and electrical requirements

GB/T 14549-1993, Quality of Electric Energy Supply - Harmonics in Public Supply Network

GB 15578, Safety requirements for resistance welding machine

3 Terms and definitions

For the purposes of this document, the terms and definitions defined in GB/T 2900.22, GB/T 8118, GB/T 15579.1, GB/T 8366, GB 15578, and GB/T 25301 as well as the followings apply.

3.1 minimum allowable values of energy efficiency for welding machines The maximum guaranteed value of allowable efficiency of an arc welding machine in the rated state, the maximum limit of short circuit loss allowed by a resistance welding machine in the rated gear, under standard-specified test conditions.

3.3 short circuit loss for resistance welding machine The active power input to a resistance welding machine when the secondary winding of the resistance welding machine (where applicable, including a rectifier) is in the best short circuit condition, and at the rated gear position, an appropriate voltage at the rated frequency is applied to the primary winding of the resistance welding machine, when the current flowing through the primary winding is the continuous input current I_{1P} of the resistance welding machine.

4 Energy efficiency grades of welding machine

The energy efficiency grade of welding machine is divided into 3 grades, where grade 1 is the highest energy efficiency. The energy efficiency indicators of arc welding machines at all grades shall comply with corresponding provisions in Table 1 ~ Table 6.

5 Technical requirements

The minimum allowable values of energy efficiency for welding machines shall be grade 3 energy efficiency, where the efficiency (%) of the arc welding machine shall not be lower than the grade 3 requirements in Tables 1 ~ Table 6 and the short circuit loss for resistance welding machine shall not be higher than the grade 3 requirements in Table 7 ~ Table

10. If the nominal load duration of resistance welding machine is 50%, the power S_{50} , not consistent with the S_{50} determined in Tables 7 ~ Table 10, it shall comply with the provisions on grade 3 corresponding to the adjacent small nominal power S_{50} .

6 Test methods

6.1 Test conditions A new, dry, and fully-installed welding machine shall be tested at an ambient Nominal power S_{50} of

6.3 Power supply

6.3.1 Classification and parameters of power supply mode When measuring the energy

efficiency indicators of arc welding machines and resistance welding machines, if grid power is used, the power of the input power inlet of the welding machine shall meet the requirements of 6.3.2.

6.3.2 Grid power supply The power supply shall meet the requirements of GB/T 156 and meet the following requirements.

6.3.3 Variable frequency power supply When measuring the energy efficiency of an inverter resistance welding machine, it requires variable frequency power supply or power supply by variable frequency controller of resistance welding machine. In addition to self- power supply by inverter controller that supports the resistance welding machine, the inverter power supply to the inverter resistance welding machine

6.4 Test site layout

6.4.1 Welding machine layout When conducting the energy efficiency test on welding machines, the test site layout of welding machines shall meet the following requirements.

6.4.2 Input cable layout When conducting the energy efficiency test on welding machines, the input cable layout shall meet the following requirements.

6.4.3 Measuring device layout When conducting the energy efficiency test on welding machines, the measuring device layout shall meet the following requirements.

Note 1. 2. **Search (Optional).** Enter the keyword '**GB 28736-2019**' in the search bar, if it is not already shown. 3.

Note 2. 9.

Note 3. 10. **Verification (USD

Notes and Explanations

Note 1:**[GB 28736-2019](https://

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