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# NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA



# GB/T 44686-2024

## Safety of machinery - Control of hazardous energy - General principles

机械安全 危险能量控制 通则

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# Table of Contents

## Foreword

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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 is proposed and coordinated by the National Technical Committee for Machinery Safety Standardization (SAC/TC208). This document was drafted by: Nan'an Zhongji Standardization Research Institute Co., Ltd., Hefei Ruizhi Technology Co., Ltd., Suzhou Weijia Technology Co., Ltd. Co., Ltd., China Testing International Group Co., Ltd., Xiamen Keli Electronics Co., Ltd., Pilz Electronics (Changzhou) Co., Ltd., Ningbo Weicheng Technology Co., Ltd., Suzhou Lane Precision Alloy Co., Ltd., Jining Keli Optoelectronics Industry Co., Ltd., Zhejiang Kaifubo Technology Co., Ltd., Shenzhen Wance Technology Co., Ltd., Suzhou Quality and Standardization Institute, Qingdao Soft Control Electromechanical Engineering Co., Ltd. Company, Zhejiang Aopeng Industry and Trade Co., Ltd., Lantu Automobile Technology Co., Ltd., Jinan Casting and Forging Inspection Technology Co., Ltd., Aohuang Testing Technology Service (Shanghai) Co., Ltd., GAC Honda Automobile Co., Ltd., Fujian Sian Intelligent Technology Development Co., Ltd., EUCHNER Electric (Shanghai) Co., Ltd. Ltd., China Machinery Research Institute of Standards and Technology (Beijing) Co., Ltd., Shandong Weihe Transmission Co., Ltd., Sichuan Shuxing Youchuang Safety Technology Co., Ltd., Fujian Minxuan Technology Co., Ltd., Hangzhou Xinzeyuan Medical Technology Co., Ltd., Shandong Sanwei Heavy Industry Co., Ltd., Shanxi Tuyue Coal Preparation Engineering Technology Co., Ltd., China Coal Beijing Coal Mine Machinery Co., Ltd., Dongguan Dior CNC Equipment Co., Ltd., Shandong Gold Mining (Xinhui) Co., Ltd., Hubei Huazhong Electric Power Technology Development Co., Ltd., Qingdao Leiyue Heavy Industry Co., Ltd., Shandong Yibo Optoelectronics Technology Co., Ltd., Dongguan Dayan Automation Equipment Co., Ltd., Guangdong Quanguan Intelligent Technology Co., Ltd., Shandong Yang Fan Bearing Co., Ltd., Shandong Chint Industrial Equipment Installation Co., Ltd., Jiangxi Shenglisu CNC Machinery Co., Ltd., Shandong Huaheng New Materials Co., Ltd. Co., Ltd., Guangdong Huahui Intelligent Equipment Co., Ltd., Shandong Yanggu Shunda Plastic Co., Ltd., Xunde Machinery (Dongguan) Co., Ltd., Jinan Wanxiangtong Machinery Co., Ltd., Shandong Guangli Tower Co., Ltd., Shandong Shunfa Heavy Industry Co., Ltd., Yuyao Taisu Automation Technology Co., Ltd., Qingdao Automobile Radiator Co., Ltd., Shandong Lier New Materials Co., Ltd., Dongguan Pengjin Machinery Technology Co., Ltd., Shandong Rihui Cable Group Co., Ltd., Qingdao Huaruifeng Machinery Co., Ltd., Likai Precision Technology (Yancheng) Co., Ltd., Ningbo Feitu Automatic Technology Co., Ltd., Guoneng Jiangsu Electric Power Engineering Technology Co., Ltd., Jiangxi Ganma Intelligent Technology Co., Ltd., Shenzhen Peitian Intelligent Manufacturing Equipment Co., Ltd.,

Jiyuan Fengze Special Steel Industry Co., Ltd., Guangdong Kerui Strontium CNC Technology Co., Ltd., Zhejiang Sanrui Automobile Technology Co., Ltd., Wenling Sanhe CNC Machine Tool Equipment Co., Ltd., Guangdong Yuqi Testing Co., Ltd., Shenzhen Deertai Technology Co., Ltd., Zhejiang Anghuaxin Materials Co., Ltd., Xiangshan Shenda Automobile Parts Co., Ltd., Cixi Dahua Electric Co., Ltd., Ningbo Yahui Intelligent Technology Co., Ltd., Guangdong Zhenyu Technology Co., Ltd., Ningbo Ouling Elevator Parts Co., Ltd., Zaozhuang Hengxiang Paper Products Co., Ltd., Dongguan Yike CNC Technology Co., Ltd. Technology Co., Ltd., Shenyang Yongpan Metal Products Co., Ltd., Guangdong Jinya Technology Co., Ltd., Hangzhou Taishang Intelligent Equipment Co., Ltd., Yiwu Jinglong Mould Co., Ltd. The main drafters of this document are. Zhu Bin, Liu Yufu, Chang Yuan, Sang Wanyong, Zhang Peng, Huang Qing, Li Junxu, Tian Shaozhuang, Huang Zhijiong, Dai Wenjie, Zhang Xiuzhuo, Li Haiming, Xia Yan, Zhang Jingjing, Chen Zhuoxian, Yang Huili, Chen Guoliang, Lu Jun, Chen Miaoren, Huang Fei, Qu Zhong, Qin Peijun, Lu Xiaoguang, Liu Zhiyong, Fu Huiqing, Zheng Huating, Wang Qiurong, Yang Weisheng, Shangguan Yonggang, Bao Dongsheng, Guan Bingzheng, Wang Zhen, Shi Yanbing, Sun Ning, Tao Qingbin, Lei Mingkai, Xiao Dafang, Zhou Jian, Yang Bin, Xu Guang, Yan Haifeng, Sun Jie, Zhang Siyuan, Wang Jiping, Song Tingzeng, Wei Zhen, Wang Lijun, Xi Ruijiang, Yang Zhen, Sui Qiaoguang, Wang Changhai, Tan Junhua, Wang Jing, Song Zhen, Zhao Zhiliang, Ma Zhihua, Shi Hongwei, Gao Ruibin, Zhou Xiangbo, Lü Zhanzhan, Wang Zeqiang, Lü Wenlong, Zhao Houmei, Zhang Guofang, Chen Yonglong, Wang Guangjian, Chai Song, Zhang Biying, Wu Chunping, Qu Huahui, Chen Guangcheng, Li Jian, Chen Mingzhen, Lin Jianyong, Xu Zhengfang, Wang Lihua, Gong Lihua, Zhang Shuo, Wu Haijian, Xu Yongbin, Deng Chengbin, Chen Naien, Wang Zhongheng, Chen Jiaxing, Yin Xiaoyu, Wang Yihua, Zhang Lei, Jing Dongqing, Xu Haozhi, Zhang Xiaofei.

The standard system in the field of mechanical safety consists of the following categories of standards.

--- Category A standards (basic safety standards) give basic concepts, design principles and general characteristics applicable to all machinery.

--- Category B standards (general safety standards) involve a safety feature in a machine or a type of safety device with a wider range of use. - Category B1, safety features (such as safety distance, surface temperature, noise) standards; - Category B2, safety device (such as two-hand control device, interlocking device, pressure sensitive device, protective device) standards.

---C-type standards (machinery product safety standards) are standards that specify detailed safety requirements for a specific machine or a group of machines. According to GB/T 15706, this document belongs to Class B standard. This document is particularly relevant to the following stakeholders involved in machinery safety.

---Machine manufacturer;

---Health and safety agencies. Other stakeholders affected by the level of machinery safety are.

---Machine users;

---Machine owner;

---Service providers;

--- Consumer (for machinery intended for use by consumers). All the above stakeholders can participate in the drafting of this document. Furthermore, this document is intended for use by standardization bodies drafting Type C standards. The requirements specified in this document may be supplemented or modified by Type C standards. For machines that are within the scope of Category C standards and have been designed and manufactured in accordance with Category C standards, the requirements of Category C standards should be adopted first. This document provides guidance to machine users on the control of hazardous energy in the machine's power system under various interacting conditions. Safety of machinery - General rules for control of hazardous energy



## 1 Scope

GB/T 44686-2024 sets the general principles for controlling hazardous energy in machinery, the discipline known elsewhere as lockout-tagout. Its subject is the accident that keeps recurring in every industry: a machine that has been switched off but not isolated, or isolated but still holding stored energy in a raised mass, a spring, an accumulator or a capacitor, starts or moves while someone is inside it. The standard sets the basic requirements, then the control of hazardous energy during normal machine operation, and then, at length, the control of hazardous energy during maintenance: identifying the types and sources of energy present, selecting the isolation means, the shutdown and isolation sequence, the dissipation or restraint of stored energy, the verification that the isolation is effective, the application and removal of locks and tags, the arrangements for group work and for shift handover, and the restoration to service. It also covers the cases where energy cannot be fully removed and alternative measures are required. It is the general document underneath the machine-specific safety standards. It took effect on 29 September 2024.

This document specifies the requirements and methods for the control of hazardous energy during machine commissioning, normal operation and maintenance. This document applies to the control of hazardous energy in stationary machines used as intended. This document does not apply to the control of hazardous energy during machine modifications.

## 2 Normative references

The contents of the following documents constitute 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