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GB/T 46839-2025

Technical specification for N-methylpyrrolidone (NMP) waste gas recovery and waste liquid recycling devices

N-甲基吡咯烷酮（NMP）废气回收及废液循环利用装置技术规范

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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 Petroleum and Chemical Industry Federation. This document is under the jurisdiction of the National Technical Committee on Standardization of Waste Chemicals Disposal (SAC/TC294). This document was drafted by: Tianjin Muhua Qingyan Technology Co., Ltd., Binzhou Yuneng Electronic Materials Co., Ltd., and Guangdong Zhengde Industrial Technology Co., Ltd. Technology Co., Ltd., Guangdong Pengjin Intelligent Equipment Co., Ltd., Guangdong Tianruide New Energy Technology Co., Ltd., Shenghe (Pingtan) Energy Technology Co., Ltd., Hangzhou Jierui Intelligent Equipment Co., Ltd., Guangdong Ousailai Technology Co., Ltd., Guangzhou Ruishang Chemical New Materials Co., Ltd. The company, Yichang Bangpu Recycling Technology Co., Ltd., Hefei Atomic Innovation Energy Co., Ltd., Hefei University of Technology, Suzhou Julian Environmental Protection Co., Ltd. Company, Huizhou EVE Energy Co., Ltd., Ganzhou Saikewell Technology Co., Ltd., Ganzhou Zhongneng Industry Co., Ltd., Shandong Changxin Chemical Technology Co., Ltd. Technology Co., Ltd., Jiangxi Shengyuan New Materials Co., Ltd., Nanjing Jiahua Technology Co., Ltd., Xiaoyezi (Dongguan) Machinery Technology Co., Ltd. The company, Shenzhen Tiandeyi Environmental Technology Co., Ltd., and CNOOC Tianjin Chemical Research and Design Institute Co., Ltd. The main drafters of this document are. Zhao Wei, Song Yanlei, Zhang Lifeng, Tan Junhua, Meng Jili, Tang Peiping, Dai Yaming, Jiang Yongzhong, Liang Zhanxing, and Wang Hao. Gong Cheng, Wu Qingqing, Lin Zebing, Dai Guobin, Qu Hancheng, Liu Fuxian, Zhang Hongjun, Fang Fei, Xie Jiahua, Hu Kun, Zhang Jing, Zhao Meijing, Shang Hongyong, Xu Yibin Shi Yushui, Tang Shenghe, Wang Ren, He Wei, Yin Donghai, Wang Hanxiao. N-methylpyrrolidone (NMP) waste gas

recovery Technical Specifications for Waste Liquid Recycling Devices

1 Scope

GB/T 46839-2025 is the Chinese national standard covering recovering NMP from a battery electrode coating line - the condensation and adsorption of the vapour, the distillation of the recovered liquid back to the purity the slurry needs, and the recovery rate the whole economics of the line depends on. Every lithium battery cathode line runs on NMP, and it is both expensive and a reproductive toxin. First edition. It was issued on 2 December 2025 and has been in force since 1 July 2026, as a first edition. The document is under the responsibility of the China Petroleum and Chemical Industry Federation. This page is published from the official record of the 2025 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document specifies the general requirements, system composition, and recovery procedures for N-methylpyrrolidone (NMP) waste gas recovery and waste liquid recycling devices. Including recycling methods, technical requirements, and environmental protection requirements. This document applies to the recovery of NMP waste gas, purification and storage of NMP waste liquid generated during lithium battery production.

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 5085.7 General Rules for Identification of Hazardous Wastes

GB 18599 Standard for Pollution Control of General Industrial Solid Waste Storage and Landfill

GB/T 27563 Industrial N-methyl-2-pyrrolidone

GB 30484 Emission Standard for Pollutants from Battery Industry

GB 50016 Code for Fire Protection Design of Buildings

GB 50160 Fire Protection Design Standard for Petrochemical Enterprises

GB 51283 Fire Protection Standard for Engineering Design of Fine Chemical Enterprises

3 Terms and Definitions

This document does not contain any terms or definitions that need to be defined.

4 General Requirements

4.1 The NMP waste gas recovery and waste liquid recycling device (hereinafter referred to as the "device") consists of three parts. a recovery system, a purification system, and a storage system. Composition. The device adopts a modular design, and each system can be used individually or in combination according to actual production needs.

4.2 The fire protection design of the device shall comply with the provisions of GB 50016, GB 50160 or GB 51283.

4.3 The layout of the equipment should conform to the main production process and site conditions.

4.4 The overall layout of pipelines and equipment of the facility should be designed, constructed, and put into production and use simultaneously with the main project.

4.5 The equipment shall be equipped with effective anti-corrosion and anti-leakage measures. Materials in contact with NMP shall be selected that are resistant to NMP corrosion.

4.6 The device should be equipped with an automated control system, which should communicate and interlock with the positive electrode coating machine, the upstream equipment of the lithium battery production line, and have alarm functions. Install an uninterruptible power supply.

4.7 The equipment shall take appropriate heat preservation and antifreeze measures according to the local environmental conditions, and all measures shall meet the production process requirements.

5.1 Recycling System

5.1.1 The recovery system mainly includes an exhaust and return air unit, a waste heat recovery unit, and an NMP exhaust gas recovery and tail gas treatment unit.