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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 46326.2-2025

Rubber products - Determination of toxic and harmful substances - Part 2: Short chain chlorinated paraffins (SCCPs)

橡胶制品 有毒有害物质的测定 第2部分：短链氯化石蜡

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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. This document is Part 2 of GB/T 46326, "Determination of Toxic and Hazardous Substances in Rubber Products". GB/T 46326 has been published. The following section.

1.Pentachlorothiophenol;

2.Short-chain chlorinated paraffins. 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 Rubber and Rubber Products (SAC/TC35). This document was drafted by: Shandong Linglong Tire Co., Ltd., Triangle Tire Co., Ltd., and Beijing Academy of Science and Technology. Analysis and Testing Institute (Beijing Physical and Chemical Analysis and Testing Center), Double Coin Group Shanghai Tire Research Institute Co., Ltd., and Evy Rubber Research Institute Co., Ltd. The company, Guizhou Tire Co., Ltd., Shandong Yanggu Huatai Chemical Co., Ltd., Bayi Rubber Co., Ltd., Shanghai Municipal Bureau of Quality and Technical Supervision Supervision and Inspection Technology Research Institute, Jiangsu Tianrui Instrument Co., Ltd., Zhuzhou Times New Material Technology Co., Ltd., Beijing Rubber Research Institute Rubber Wheel Tire Inspection Technology Service Co., Ltd., Beijing Rubber Industry Research and Design Institute Co., Ltd. The main drafters of this document are. Zhang Lijie, Jia Airui, Xu Qiuhuan, Ni Shujie, Shao Peng, Yang Ming, Dong Wenwu, Zhang Lingyan, Jia Weijie, and Liu Xiaoci. Zhou Qian, Zhang Xinfeng, Wu Yuzhen, Yang Shuo, Liu Jun, Sun Duozhi, Wu Yaping, Yang Xiaoyan, Li Shenghui, Jiang Ying, Tan Lianying, Niu Danwei, Dong Caiyu Ding Xiaoying and Wang Na.

Short-chain chlorinated paraffins (SCCPs) are chlorinated derivatives of straight-chain alkanes, with a chain length of 10 to 13 carbon atoms and a chlorination degree of 40%. 70%. In rubber products, short-chain chlorinated paraffins are mainly used as plasticizers and flame retardants, which can improve the processing properties of rubber products or

make rubber products... It has flame-retardant properties. In recent years, SCCPs have been proven to be a class of persistent, bioaccumulative, and physiologically toxic chemicals, posing significant environmental and health risks. This has a significant impact on the ecosystem. To protect the environment and promote the green and sustainable development of the rubber products industry, it is necessary to establish a method for measuring the content of short-chain chlorinated paraffins. Determining a method is essential. GB/T 46326, "Determination of Toxic and Hazardous Substances in Rubber Products," aims to provide a method for determining the content of toxic and hazardous substances in rubber products. The law is proposed to be divided into the following parts.

1.Pentachlorothiophenol;

2.Short-chain chlorinated paraffins;

---Part x. Determination of Lead Content;

---Part x. Determination of Cadmium Content;

---Part x. Determination of Polycyclic Aromatic Hydrocarbon Content;

---Part x. Determination of polybrominated biphenyls and polybrominated diphenyl ethers; Determination of toxic and harmful substances in rubber products Part

1 Scope

GB/T 46326.2-2025 is the Chinese national standard covering short chain chlorinated paraffins in rubber - the extraction from a filled compound, the separation from the medium and long chain homologues that are not restricted, the mass spectrometric determination, and the quantification against a mixture of thousands of congeners. SCCPs are listed under the Stockholm Convention, which is why this is now measured routinely. Part 2 of the series, first edition. In force from 1 May 2026. Issued on 5 October 2025, it has been in force since 1 May 2026.

This document describes the use of gas chromatography-electron capture negative chemical ion source mass spectrometry to determine C10-C13 short-chain chlorides in rubber products. Methods for determining the content of SCCPs (skin waxes, copper... This document applies to the determination of SCCPs content in rubber products.

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 3516-2024 Determination of solvent extractables in rubber

GB/T 17783 Preparation of chemical test samples and specimens for vulcanized or thermoplastic rubber

3 Terms and Definitions

The following terms and definitions apply to this document.

3.1 A mixture of chloroalkanes with 10 to 13 carbon atoms, with the general chemical formula Cm H2m 2-nCln (m=10 to 13).

4.Principles The sample was added to n-hexane and subjected to Soxhlet extraction. The extract was then eluted using a silica gel solid-phase extraction column and purified with concentrated sulfuric acid. The final product was obtained using a gas... Determination was performed using chromatographic-electron capture negative chemical ionization source mass spectrometry (GC-ECNI-MS), with quantification using the internal standard method.

5.Reagents or materials Unless otherwise specified, all reagents used are of analytical grade.

5.3 Dichloromethane. chromatographic grade.

5.4 Concentrated sulfuric acid. approximately 98% (mass fraction).