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

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**Requirements for concentration limits of restricted substances
in tyres**

轮胎中限用物质的限量要求

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Foreword

This Standard was drafted in accordance with the rules given in GB/T 1.1-2009. This Standard was proposed by China Petroleum and Chemical Industry Federation. This Standard shall be under the jurisdiction of National Technical Committee on Tyre rims of Standardization Administration of China (SAC/TC 19). The drafting organizations of this Standard: Triangle Tire Co., Ltd., Shandong Linglong Tire Co., Ltd., Shandong Fengyuan Tire Manufacturing Co., Ltd., Double Star Group Co., Ltd., Beijing Rubber Industry Research and Design Institute Co., Ltd., Jiangsu Academy of Inspection and Quarantine Science and Technology, Zhongce Rubber Group Co., Ltd., Shuangqian Tire Group Co., Ltd., Fengshen Tire Co., Ltd., Wanli Tire Co., Ltd., Qingdao Senqilin Tire Co., Ltd., Sichuan Tire & Rubber (Group) Co., Ltd., Guizhou Tire Co., Ltd., Xiamen Zhengxin Rubber Industry Co., Ltd., Pulin Chengshan (Shandong) Tire Co., Ltd., Ningxia Shenzhou Tire Co., Ltd., Sailun Group Co., Ltd., Jinyu Tire Group Co., Ltd., Shandong Huasheng Rubber Co., Ltd., Tianjin Wanda Tire Group Co., Ltd., Shandong Taishan Tire Co., Ltd., China Quality Certification Center, Michelin (China) Investment Co., Ltd., Dalian Goodyear Tire Co., Ltd., Continental Horse Tire (China) Co., Ltd., Bridgestone (China) Investment Co., Ltd., Pirelli Tire Co., Ltd., Sumitomo Rubber (China) Co., Ltd., Han Thai Tire Co., Ltd., SAIC-GM-Wuling Automobile Co., Ltd. Main drafters of this Standard: Ni Shujie, Ma Xiuju, Chen Shaomei, Pan Chao, Wang Lufei, Xu Lihong, Mou Shouyong, He Zhonghui, Ren Fujun, Fang Zhijun, Wang Xiaojuan, Cheng Mei, Zhang Kaikai, Zhang Junwei, Li Daiqiang, Chen Jianming, Liu Changbo, Chen Gang, Shi Qingyun, Li Weiguo, Chen Jianjun, Yu Zhenjiang, Wang Junling, Zhao Xiang, Ye Wei, Yin Qingye, Ma Zhong, Zhu Cheng, Niu Fuxiang, Huang Xiaoqing, Liang Bin, Fang Hua, Wang Kexian, Li Shuhuan. Requirements of concentration limits for restricted substances in tyres

1 Scope

China's national standard for the concentration limits of restricted substances in tyres. It specifies the terms and definitions, the raw materials that may not be used and the limits that apply. The substance behind the standard is the class of highly aromatic extender oils that were used for decades to soften rubber compounds. They work well, they are cheap, and they contain polycyclic aromatic hydrocarbons, several of which are carcinogenic. A tyre wears away over its life, so the compound ends up as road dust and then in surface water and soil, which is the exposure route that concerns regulators rather than contact with the tyre itself. Europe restricted them in 2010 and the industry reformulated to purified aromatic extracts and to naphthenic oils. China's standard brings the same restriction into its own regime, alongside limits on other substances such as N-nitrosamines and certain accelerators, and covers tyres made for domestic sale as well as export.

This Standard specifies the raw materials that shall not be used, restricted substances and requirements, test methods, sample preparation and determination principles in rubber tyres (including inner tubes and cushion tapes). This Standard is applicable to rubber tyres (including inner tubes and cushion tapes).

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 519, Test methods for measuring physical properties of pneumatic tyres

GB/T 6326, Tyre terms and definitions

GB/T 9874, Determination of lead content by atomic absorption spectrometry

GB/T 26125, Electrical and electronic products - Determination of six regulated substances (lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls, polybrominated diphenyl ethers)

GB/T 29607, Rubber product - Determination of cadmium content - Atomic absorption spectrometry

GB/T 29610, Rubber products - Determination of polybrominated biphenyls and polybrominated diphenyl ethers - Gas chromatography and mass spectrometry

GB/T 29614, Determination the content of polycyclic aromatic hydrocarbons in vulcanized rubber compounds SN/T 3814, Determination of short chain chloroparaffin in rubber and plastic

4 Hexavalent chromium (Cr6+) ≤0.1

5.3 Polybrominated biphenyls (PBBs) and polybrominated diphenyl ethers (PBDEs) The total amount of polybrominated biphenyls (PBBs) and polybrominated diphenyl ethers (PBDEs) in the tyre shall be no more than 0.1% (in terms of mass fraction).

5.4 Short-chain chlorinated paraffin (SCCP) (compounds with a carbon chain length of C10~C13) The content of short-chain chlorinated paraffin (SCCP) in the tyre shall be no more than 0.1% (based on mass fraction).

5.5 Raw materials for tyre production that may contain or produce restricted substances See Annex A for raw materials for tyre production that may exist or produce restricted substances.

5 Restricted substances and requirements in tyres

5.1 Polycyclic aromatic hydrocarbons (PAHs) Tested by nuclear magnetic resonance hydrogen spectroscopy (1H NMR) method, the polycyclic aromatic hydrocarbons in the tyre shall have a H Bay content not greater than 0.35%.

5.2 Lead (Pb), mercury (Hg), cadmium (Cd), hexavalent chromium (Cr6+) The content of lead (Pb), mercury (Hg), cadmium (Cd), and hexavalent chromium (Cr6+) in the tyre shall meet the limit requirements in Table 2. Table 2 -- Limit requirements for lead (Pb), mercury (Hg), cadmium (Cd), and hexavalent chromium (Cr6+) in tyres No. Restricted substance Limit requirements (mass fraction) %