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# NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA



# GB/T 32610-2016

## Technical specification for daily protective masks

日常防护型口罩技术规范

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**Standardization Administration of the PRC**

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## Foreword

This Standard is drafted in accordance with the rules given in GB/T 1.1-2009. This Standard is proposed by China National Textile and Apparel Council. This Standard is under the jurisdiction of National Technical Committee Textiles of Standardization Administration of China (SAC/TC 209). Drafting organizations of this Standard. China Nonwovens and Industrial Textiles Association, Jiangsu Quality Supervision and Inspection Center for Special Type Products of Safety Protecting, Beijing Municipal Institute of Labor Protection, Shanghai Sinotextiles Corporation Limited, Beijing Institute of Medical Device Testing, Donghua University, Tianjin Teda Filters Co., Ltd., Institute of Urban Environment under Chinese Academy of Sciences, Guangzhou Fiber Product Testing and Research Institute, Winner Medical Co., Ltd., Shenzhen Selen Science and Technology Co., Ltd., Unicharm Daily Necessities (China) Co., Ltd., Shenyang Baianda Personal Protective Equipment Co.,

Ltd., Yunnan Baiyao Group Co., Ltd., Honeywell Personal Protective Equipment (Shanghai) Co., Ltd., Kimberly-Clark (China) Co., Ltd., Foshan Nanhai Beautiful Medical Device Co., Ltd., Xinlong Holding (Group) Co., Ltd., Fujian Zhongrui Environmental Protection Technology Co., Ltd., Yuchuan Health Products (Shanghai) Co., Ltd., Wuhan Longfeixiang Technology Products Manufacturing Co., Ltd., Sichuan (Jiangsu) Paul Technology Co., Ltd. Main drafters of this Standard. Li Lingshen, Li Guimei, Yang Wenfen, Lu Bing, Zhao Danqing, Hu Guangyong, Ding Bin, Zhao Jinyu, Liu Ji, Zheng Yuming, Zhang Yuanhu, Xing Keqi, Zhang Fuquan, Wang Xiangqin, Gong Guozhuo, Yue Weihua, Chen Shu, Li Jianquan, Chen Jinyu, Xie Jingwei, Gao Ming, Wang Jiajun, Zhang Xinyue, Chen Zhen, Luo Jun, Zhang Peng, Xu Hong, Wang Lu, Lu Yuzheng, Chen Longmin, Liu Sheng, Hao Runlin, Huang He, Yang Jian, Yin Xia. Technical specification of daily protective mask

## 1 Scope

China's national technical specification for daily protective masks. It specifies the terms and definitions, the grading, the technical requirements, the test methods, the inspection rules and the packaging, marking, storage and transport for masks worn by the public in daily life, with normative annexes giving the test method for filter efficiency and the test method for particle protection performance, and an informative annex on wearing environments and precautions. It was written for a specific problem. China already had standards for industrial respirators, worn by trained workers who are fit tested and medically screened, and for surgical masks, worn to protect a patient from the wearer rather than the wearer from the air. Neither covered the mask that an ordinary person buys and wears in a city on a polluted day, and the market filled with products making claims that nothing tested. This standard fills that gap, and it does so with two graded scales rather than one. The filter efficiency grades describe what the filter material stops, and the protection grades describe what the mask as worn actually achieves - which are different quantities, because a mask that leaks around the face delivers far less protection than its material would suggest. Grading the protection separately, and testing it on a head form with the mask fitted, is the provision that most distinguishes this standard from a filter specification. The protection levels are expressed in terms of the ambient air quality the mask is intended for, which is what makes the grading meaningful to a member of the public choosing one. Issued on 25 April 2016 and in force since 1 November 2016.

This Standard specifies the terms and definitions, grading, technical requirements, test methods, inspection rules, packaging, marking, storage and transportation requirements of daily protective masks. This Standard applies to protective masks wore in the daily life to filter out particulate matters in the air pollution environment. This Standard does not apply to respiratory protection products used in hypoxic environments, underwater operations, escaping, fire protection, medical and industrial dust prevention and other special industries, nor for respiratory protection products for infants and children.

## 2 Normative references

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

GB 2890-2009 Respiratory protection - Non-powered air-purifying respirators

GB/T 2912.1 Textiles - Determination of formaldehyde - Part

## 3 Terms and definitions

For the purpose of this document, the following terms and definitions apply.

3.1 Particulate matter (PM2.5) Particulate matters in the ambient air with aerodynamic equivalent diameter of less than or equal to 2.5 μm, also known as fine particulate matters. [GB 3095-2012, definition 3.4]

3.2 Filter efficiency Under the specified conditions, the ability of the mask body to filter out particulate matters, expressed as percentages.

3.3 Particle protective performance Under the specified conditions, the ability of the mask to block particulate matters, expressed as percentages.



## 4 Grading

The particle protective performance of masks is divided from high to low into Grade A, Grade B, Grade C and Grade D; the ambient air quality to which each grade of masks is applicable is as shown in Table

1.All grades of masks shall be able to reduce the concentration of inhaled particulate matters (PM2.5) to <= 75 μg/m3 (the ambient air quality index category is good or above) in the corresponding air pollution environment.

### 5.1 Basic requirements

5.1.1 The mask shall be able to securely protect the mouth and nose.

5.1.2 The raw material of masks shall not be recycled materials and highly toxic, carcinogenic or potentially carcinogenic substances and materials that can cause skin irritation or other adverse reactions. Residues of other restricted substances shall meet the relevant requirements; the raw material of masks shall be no odor.

5.1.3 The mask shall not have sharp corners and sharp edges and shall not cause damage to the wearer.

5.1.4 The mask shall be easy to be wore and taken off. In the process of wearing, there

shall be no obvious sense of oppression or tenderness, and be small impact to head activities. NOTE. See Annex C for wear environments and precautions of masks.

5.2 Appearance requirements The mask surface shall be no damages, oil stains, deformations and other obvious defects.

5.3 Intrinsic quality The requirements for intrinsic quality are as shown in Table 2.

5.4 Filter efficiency According to the filter efficiency, the mask is divided into. Grade I, Grade II and Grade III. The corresponding indicators of each grade is as shown in Table 3.

### 5.5 Particle protective performance

5.5.1 The particle protective performance requirement for masks of different particle protective performance grades is as shown in Table 4.

5.5.2 When the particle protective performance of the mask is Grade A, the filter efficiency shall be Grade II and above; when the particle protective performance of the mask is Grade B, Grade C or Grade D, the filter efficiency shall be Grade III and above.

## 6 Test methods

6.1 Visual inspection EXTRACT of 10 masks, INSPECT them using visual inspection method. The inspection light is subject to normal natural light; if fluorescent lighting is used, the illumination shall be not less than 400 lx.

6.2 Color fastness to rubbing TEST according to the specifications of GB/T 29865.For color fastness to dry rubbing, the outer layer of the mask is tested; for color fastness to wet rubbing, the layer of the mask contacting with human face is tested.

6.3 Formaldehyde content TEST according to the specifications of GB/T 2912.1.

6.4 pH value TEST according to the specifications of GB/T 7573.The sample is cut from the layer of the mask contacting with human face.

6.5 Decomposable carcinogenic aromatic amine dyes TEST according to the specifications of GB/T 17592 and GB/T 23344. NOTE. In general, test according to GB/T 17592 first, when aniline and/or 1,4- phenylenediamine are detected, test according to GB/T 23344.

6.6 Ethylene oxide residues According to the product identification, the mask treated with ethylene oxide is tested according to the specifications of Clause 9 in GB/T 14233.1-2008.TAKE a parallel sample to test, and the sample is cut from the mask body. If one of the test results is qualified, and another test result is unqualified, the mean is not calculated; it shall resample to test, and the highest value is taken as the test result. The calculation result is expressed as relative content, accurate to one decimal place.