



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

GB/T 2891-1995

**Performance test methods for facepiece of filter type respirator
(English Translation)**

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1 Subject content and scope of application

This Standard specifies the air leakage coefficient for the wearing, actual dead space, field of view, assembly air tightness, exhalation valve air tightness, exhalation valve resistance to air, lens transmittance (transmittance ratio) and facepiece inhalation resistance and other performance test methods for filter type respirators.

This Standard applies to the test and evaluation of the performance of filter type respirators (hereinafter referred to as facepieces); it also applies, as a reference, to other related products.

2 Normative references

GB/T 528, Rubber, vulcanized or thermoplastic - Determination of tensile stress-strain properties
GB 2410, Transparent plastics - Transmissivity and haze test
GB 2428, Head-face dimensions of adults

3.1.1 Principle

After a person wears a respirator, the ratio OF the concentration c of harmful substances leaked into the facepiece through the facepiece sealing frame, exhalation valve and facepiece component assembly parts AND the external concentration c_0 is called the air leakage coefficient of the facepiece, which is expressed in percentage (%).

3.1.3 Test conditions

3.1.3.1

According to the fit range of each facepiece, select 10 persons whose head and face size meet the fitting test. Subjects shall be clean-shaven.

3.1.5 Test result

3.1.5.1

Calculate the air leakage coefficient k_x of the n th subject in any state of static, dynamic or speaking according to Formula (1) and Formula (2).

3.2.1 Principle

Correctly wear the facepiece under test on the standard head-face; use the mechanical lung to perform simulated breathing according to the specified conditions, so that the exhaled gas is CO₂ gas with a high concentration of a , part of which is trapped in the actual dead space and "respiratory dead space", and diluted by the air inhaled through the canister during inhaling (assuming that its CO₂ concentration is c), becoming a gas with a concentration of b , and enters the mechanical lung.

3.6.4 Test result

The resistance to air flow for each exhalation valve sample is.

3.6.5 Test report

According to 3.1.6.

3.7.1 Test device

3.7.1.1

See Figure 7 for the mask inhalation resistance test device.

Figure 7 - Diagram of the test device for mask inhalation resistance

3.7.1.6

Air pump. the suction flow rate shall not be lower than 30 L/min.

3.7.3 Test procedures

3.7.3.1

Check that each connecting part of the test device shall be airtight.

3.7.3.2

Make the flowmeter and micromanometer work normally.

3.7.3.3

Start the air pump; adjust the screw clamp so that the air flow is 30 ± 0.6 L/min;

measure the system resistance P_1 .

3.7.3.4 Wear the facepiece according to the requirements of 3.7.2.2; adjust the suction

flow to 30 ± 0.6 L/min; measure the resistance P2.

3.10.1 Principle

Measure the air tightness of the exhalation valve block of qualified air-tightness after aging for a certain period of time under the action of hot air at normal pressure and specified temperature.

3.10.2 Test device

The hot air aging box shall meet the following requirements.

3.10.4 Test procedures

3.10.4.1

Adjust the temperature in the aging box to 100 ± 2 °C. After the temperature is stable, place the test sample on the valve seat and seal it in the aging box in a free state.

The distance between the samples is not less than 5 mm; the distance between the sample and the box wall is not less than 50 mm.

3.11.3.1 Clamp the lower part of the Y-shaped tube of the facepiece that has been

assembled and placed for 24 hours into the main clamp of the tensile machine. The direction of the clamp shall be perpendicular to the Y-shaped tube.

3.11.3.2 Clamp the lower end of the air duct into the lower fixture so that the lower

fixture is about 20 ~ 30 mm away from the Y-shaped nozzle. Turn on the tensile machine, and stop the test when the reading on the load dial is greater than the specified value.

3.11.4 Test result

Read the bonding strength value from the load dial respectively; it is qualified when the reading is greater than the specified value.

3.11.5 Test report

According to 3.1.6.