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Hand protection - Protective gloves against chemicals and micro-organisms

手部防护 化学品及微生物防护手套

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Hand protection - Protective gloves against chemicals and micro-organisms

1 Scope

This Standard specifies the technical requirements, test methods and identification of protective gloves against chemicals and micro-organisms.

This Standard applies to professional protective gloves against chemicals and micro-organisms.

2 Normative references

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

GB/T 12624-2009, Protective gloves - General requirements and test methods

GB/T 23462-2009, Protective clothing - Test method for chemical protective materials to permeation by chemicals

GB 24541-2009, Hand protection - Protective gloves against mechanical risks

3 Terms and definitions

The following terms and definitions are applicable to this document.

3.1 Protective gloves materials

Materials or combinations of materials which are used in protective gloves to avoid hands or hands and arms in direct contact with chemicals and/or micro-organisms.

3.2 Protective gloves against micro-organisms

Protective gloves that can form an effective barrier against other types of micro-organisms, excluding viruses, to prevent them from penetrating.

3.3 Degradation

Destructive changes of one or more of the properties of the protective gloves, including peeling, swelling, chipping, embrittlement, discoloration, deformation, appearance changes, hardening, and softening, due to the contact with chemicals.

3.4 Penetration

The process of chemicals and/or micro-organisms passing through the protective gloves at the non-molecular level through defects such as pores, seams, pinholes on the protective glove material.

3.5 Permeation

The process of chemicals passing through the protective gloves materials at the molecular level, which includes the process of chemical molecules being adsorbed by the material, diffusing in the material, and separating from the other side of the material.

3.6 Test chemical

Under laboratory conditions, the chemical or chemical mixture which is used to determine the breakthrough time of protective gloves materials.

3.7 Breakthrough time

The time interval from the test chemical is applied to the outer layer of the protective glove material to it appears on the other side of the material.

4 Technical requirements

4.1 General principles

4.1.1 The main materials and auxiliary materials which are used in protective gloves (such as glove lining, thread, welt) shall be free of skin irritation or harm to the safety and health of the user.

4.1.2 The design and manufacture of protective gloves shall ensure the uniformity of the thickness of the main body material of each part of the gloves.

4.1.3 The design and manufacture of protective gloves need to consider the use requirements, so that the user can obtain maximum protection and operational flexibility during related work activities; the gloves shall be easy to wear and take off.

4.1.4 The structural design of protective gloves shall be compatible with other supporting personal protective equipment.

5.2 Flexibility

Carry out the test in accordance with the provisions of 6.3 in GB/T 12624-2009.

5.3 Penetration resistance

Perform the test according to the provisions of Appendix A.

5.4 Permeation resistance

Cut the sample from the palm and back of the protective gloves; perform the test according to the provisions of 6.4 in GB/T 23462-2009.

5.5 Abrasion resistance

Carry out the test in accordance with the provisions of 5.2 in GB 24541-2009.

5.6 Blade cut resistance

Carry out the test in accordance with the provisions of 5.3 in GB 24541-2009.

5.7 Tearing resistance

Carry out the test in accordance with the provisions of 5.4 in GB 24541-2009.

5.8 Puncture resistance

Carry out the test in accordance with the provisions of 5.5 in GB 24541-2009.

6 Identification and information

6.1 Identification

The identification of protective gloves shall meet the requirements of 7.1 in GB/T 12624-2009. The identification diagram of protective gloves shall be used together with the standard number of this Standard and the corresponding number in Table 1 of the chemicals which are used in the test (see Figure 1 for example).

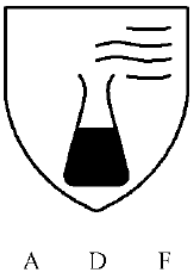

Figure 1 -- Chemical hazard protection identification (example)

Appendix A

(Normative)

Penetration resistance test method

A.1 Scope

This Appendix specifies the test method for the penetration resistance of protective gloves against chemicals and micro-organisms.

This test method includes two test methods: air tightness test and liquid tightness test. Among them, the air tightness test method is the preferred method, but the air tightness test may not be applicable to all protective gloves. Some gloves cannot be filled with air evenly. When inflated, some parts are extremely inflated while other parts are not filled or even unable to be inflated; at the moment, the air tightness test should not be used, and only the liquid tightness test can be used.

A.2 Principle

A.2.1 Air tightness test

Immerse the glove which is filled with air of certain pressure in the water. If a series of bubbles are found on the surface of the glove, it means that the glove is leaking.

A.2.2 Liquid tightness test

Fill the glove with water. If water seepage is found on the surface of the glove, it means that the glove is leaking.

A.3 Sampling

Take 1 glove for each size; take at least 4 gloves for each test.

A.4 Test device

A.4.1 Air tightness test device

The schematic diagram of the air tightness test device is shown in Figure A.1, which mainly includes the following components:

a) Test plug, which has a certain taper, and can provide a suitable diameter range to keep the test gloves airtight. The plug can rotate 180° around the axis; the enlarged schematic diagram is shown in Figure A.2;

Carefully remove the gloves from the packaging. Record the identification code, batch number, size and trademark of the glove. Check the glove visually. If the glove has tears, cracks and holes, report the glove as unqualified.

A.5.2 Air tightness test

A.5.2.1 Fix the gloves on the round mandrel; soak in water at room temperature. Then, inflate into the glove according to the pressure corresponding to Table A.1; the pressure increases by 1 kPa for every 100 mm increase in the distance between the glove fingertip and the water surface. For example, if the grove fingertip is immersed in the water at a depth of 250 mm, the inflation pressure in the glove shall be added 2.5 kPa on the basis of Table A.1. The inflation pressure in the gloves shall be maintained for 2 minutes; the fluctuation shall not exceed ±10% of the inflation pressure. When observing the possible bubbles, the test time can be extended, but it shall not exceed 30 s.

Table A.1 -- Corresponding table of glove thickness and inflation pressure

A.5.2.2 Gloves whose length is less than 250 mm shall be immersed vertically in water, so that the water covers as much surface area of the gloves as possible. Gloves longer than 250 mm shall be immersed in the water at an angle, so that the vertical immersion depth of the middle fingertip of the glove is (250 ± 10) mm, so that the water covers the largest possible surface area of the glove. Rotate the round mandrel to check whether there are bubbles on the entire glove surface (see Figure A.1).

A.5.3 Liquid tightness test

A.5.3.1 Align the edge of the glove cuff with the 40 mm mark on the plastic tube (see Figure A.3); use an elastic band to fasten it to keep it liquid tight.

A.5.3.2 Inject at least 1 000 mL of room-temperature water into the glove through the plastic tube; the liquid level shall reach at least the 40 mm mark.

Note 1: Due to the difference of the test gloves, some of the 1 000 mL of water may remain in the tube.

Note 2: If necessary, use suitable methods to support the gloves, so as to prevent the gloves from deforming due to the gravity of the water.

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