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

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**Protective clothing -- Protective clothing against liquid acids
and alkalis**

(English Translation)

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1 Scope

This Standard specifies the grading, technical requirements, test methods, inspection rules and marking of protective clothing against liquid acids and alkalis.

This Standard is applicable to protective clothing against liquid acids and alkalis used by operators in industrial workplaces.

This Standard is not applicable to protective clothing against liquid acids and alkalis used in fire-fighting, emergency rescue and other workplaces.

This Standard is not applicable to protective clothing against hydrofluoric acid, ammonia, organic acids and alkalis.

NOTE: The protection objects of products covered by this Standard are liquid acids and alkalis;

but this Standard cannot cover the protection against all liquid acids and alkalis. Users shall combine the protection performance data provided by the manufacturer according to the actual situation on site to choose appropriate protective equipment by referring to relevant selection and preparation standards.

2 Normative References

The provisions in following documents become the provisions of this Standard through reference in this Standard. For dated references, the subsequent amendments (excluding corrigendum) or revisions do not apply to this Standard, however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest edition of the referenced document applies.

GB/T 2912.1-1998 Textiles - Determination of Formaldehyde - Part 1: Free and Hydrolyzed Formaldehyde (Water Extraction Method) (eqv ISO 14184-1:1997)

GB/T 3917.3-1997 Textiles - Tear Properties Fabrics - Part 3: Determination of Tear Force of Trapezoidal Shaped Test Specimens (eqv ISO 9073-4:1984)

GB/T 3920-2008 Textiles - Tests for Color Fastness - Color Fastness to Rubbing (ISO 105-X12:2001, MOD)

GB/T 3923.1-1997 Textiles - Tensile Properties of Fabrics - Part 1: Determination pinholes or defects.

3.5 Permeation

The process of chemical molecules passing through the protective clothing, including the process of the adsorption of chemical molecules by the clothing material, the diffusion in the clothing material, and the desorption from the other side of the clothing material.

4 Grading

Fabric protective clothing is divided into Grade-I, Grade-II and Grade-III according to penetration time and liquid static pressure resistance; non-fabric protective clothing is divided into Grade-I, Grade-II and Grade-III according to penetration time. Among them, the protection performance of the Grade-I is the lowest; and the protection performance of the Grade-III is the highest. The lowest level among the grading conditions is taken as the protection level.

5.1 General requirements

5.1.1

The structure of the clothing shall be conducive to the safety and hygiene of the wearer. The materials in direct contact with the skin shall be free of skin irritation or other harmful health effects, and shall not affect the normal physiological requirements of the human body.

5.1.2

The clothing shall be easy to put on and take off and facilitate physical activities during operation.

5.1.3

Jacket of the two-piece protective clothing shall be "neckline tight, cuffs tight and hem tight"; while the pants shall be straight pants (see Figure 1 for schematic diagram).

One-piece protective clothing shall be "neckline tight, cuffs tight, bottom of pants tight" (see

Figure 2 for schematic diagram). The clothing shall be as light as possible and easy to act and easy to put on and take off.

5.1.4

The joint portions of the protective clothing shall be tight and reasonable to prevent intrusion of acids and alkalis; the structure of the protective clothing shall be considered for use with other protective equipment, such as jacket sleeves and protective gloves, pants and protective shoes (boots), the joint parts of which shall be tight and reasonable to prevent intrusion of acids and alkalis.

5.1.5

There shall be no patch pockets and other structures on the clothing that can store acids and alkalis, but there may be inside pockets.

6.5 Seam breaking strength

The seam breaking strength shall be tested according to Appendix H.

6.6 Spray liquid tightness

The spray liquid tightness shall be tested according to Appendix I.

6.7 Jet liquid tightness

The jet liquid tightness shall be tested according to Appendix J.

6.8 Wear resistance

The non-fabric protective clothing against liquid acids and alkalis shall be tested according to 4.3.1 in AQ 6102-2007.

6.9 Flexibility resistance

The non-fabric protective clothing against liquid acids and alkalis shall be tested according to Method-A in GB/T 12586-2003.

6.10 Puncture resistance

The non-fabric protective clothing against liquid acids and alkalis shall be tested according to GB/T 20655-2006.

6.11 Breaking strength and tearing strength

The breaking strength and tearing strength of the fabric protective clothing against liquid acids and alkalis shall be tested according to GB/T 3923.1-1997; while the tearing strength shall be tested according to GB/T 3917.3-1997. The breaking strength of the non-fabric

protective clothing against liquid acids and alkalis shall be tested according to HG/T 2580-1994.

6.12 Color fastness to dry rubbing

The fabric protective clothing against liquid acids and alkalis shall be tested according to GB/T 3920-2008.

6.13 Formaldehyde content

The fabric protective clothing against liquid acids and alkalis shall be tested according to GB/T 2912.1-1998.

6.14 pH value

The fabric protective clothing against liquid acids and alkalis shall be tested according

4 - Sample;

5 - Marking line;

6 - Reagent chamber;

7 - Sampling end;

8 - Flange ring.

Figure B.1 - Schematic Diagram of Permeation Test Chamber

B.2.2 Analytical device

The corresponding concentration analysis device shall be selected according to the type of reagent; and the accuracy of the analysis device shall reach 0.71 mg/L.

B.2.3 Reagents

From Table L.1 in Appendix L, select the acid and/or alkali corresponding to the protection object marked on the product as the test reagent. The protective clothing against inorganic acid shall be tested with 98% sulfuric acid, 30% hydrochloric acid and 60% nitric acid, respectively; the protective clothing against inorganic alkali shall be tested with 40% sodium hydroxide; the protective clothing against inorganic acid and alkali shall be tested with 98% sulfuric acid and 30% hydrochloric acid, 60% nitric acid and 40% sodium hydroxide, respectively.

B.2.4 Collection medium

Use water as the collection medium.