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Testing Methods of Physical and Chemical Performance of Garments

服装理化性能的检验方法

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Testing Methods of Physical and Chemical Performance of Garments

1 Scope

This document describes the test methods for physical and chemical performance of garments.

This document is applicable to the inspection of physical and chemical performance technical indicators of garment products produced with textile woven fabrics as the main fabric.

2 Normative References

The contents of the following documents constitute indispensable clauses of this document through the normative references in the text. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 250 Textiles - Tests for Color Fastness - Grey Scale for Assessing Change in Color

GB/T 251 Textiles - Tests for Color Fastness - Grey Scale for Assessing Staining

GB/T 2910 (all parts) Textiles - Quantitative Chemical Analysis

GB/T 2912.1 Textiles - Determination of Formaldehyde - Part 1: Free and Hydrolyzed Formaldehyde (water extraction method)

GB/T 3917.1 Textiles - Tear Properties of Fabrics - Part 1: Determination of Tear Force Using Ballistic Pendulum Method (Elmendorf)

GB/T 3917.2 Textiles - Tear Properties of Fabrics - Part 2: Determination of Tear Force of Trouser-shaped Test Specimens (single tear method)

GB/T 3920 Textiles - Tests for Color Fastness - Color Fastness to Rubbing

GB/T 3921-2008 Textiles - Tests for Color Fastness - Color Fastness to Washing with Soap or Soap and Soda

GB/T 3922 Textiles - Tests for Color Fastness - Color Fastness to Perspiration

GB/T 3923.1 Textiles - Tensile Properties of Fabrics - Part 1: Determination of Maximum Force and Elongation at Maximum Force Using the Strip Method

GB/T 3923.2 Textiles - Tensile Properties of Fabrics - Part 2: Determination of Maximum Force Using the Grab Method

Non-volatile Compounds by Extraction Method Using Liquid Chromatography

3 Terms and Definitions

The terms and definitions defined in GB/T 21295 are applicable to this document.

4 Determination of Basic Properties

4.1 Fiber Composition and Content

The fiber composition and content of the raw materials used in finished products shall be tested in accordance with the methods described in FZ/T 01057 (all parts), GB/T 40271, GB/T 2910 (all parts), GB/T 16988, FZ/T 30003, FZ/T 01101 and FZ/T 01144, etc.

4.2 Color Fastness

4.2.1 Color fastness to washing with soap

The color fastness of finished products to washing with soap shall be tested in accordance with the methods described in GB/T 3921-2008, and Method A (1) shall be adopted.

4.2.2 Color fastness to drycleaning

The color fastness of finished products to drycleaning shall be tested in accordance with the method described in GB/T 5711.

4.2.3 Color fastness to rubbing

The color fastness of finished products to rubbing shall be tested in accordance with the method described in GB/T 3920.

4.2.4 Color fastness to perspiration

The color fastness of finished products to perspiration shall be tested in accordance with the method described in GB/T 3922.

4.2.5 Color fastness to saliva

The color fastness of finished products to saliva shall be tested in accordance with the method described in GB/T 18886.

4.2.6 Color fastness to water

The color fastness of finished products to water shall be tested in accordance with the method described in GB/T 5713.

4.2.7 Color fastness to light

The color fastness of finished products to light shall be tested in accordance with the method described in GB/T 8427-2019, in which, the normal conditions shall be used for sun exposure, and the sun exposure shall be carried out to the first stage in accordance with Method 3.

4.2.8 Color fastness to hot pressing

The color fastness of finished products to hot pressing shall be tested in accordance with the method described in GB/T 6152, and the tidal pressure method shall be adopted. When users have special requirements for the products, the demand-side and the supply-side may separately negotiate.

4.2.9 Color fastness to storage

The color fastness of finished products to storage shall be tested in accordance with the method described in GB/T 32008-2015, and the test conditions 2 shall be adopted.

4.2.10 Color fastness to transfer in joints

The color fastness of finished products to transfer in joints shall be tested in accordance with the method described in GB/T 31127-2014, and Method A shall be adopted.

4.2.11 Color fastness to lotion staining

In accordance with the method described in Method A (1) of GB/T 3921-2008, prepare and wash the specimen. Then, pour the residual washing liquid filtered to remove impurities into a colorimetric tube (with a diameter of 25 mm). Use the soap solution that has not been washed and has the same temperature as the test as a reference sample. Under the D65 standard light source, use non-fluorescent white cardboard as the background to assess the staining degree of the lotion in accordance with GB/T 251. During the rating, the white cardboard shall be close to the colorimetric tube or single-row colorimetric tube rack, and the rating shall be completed within 15 minutes after washing is completed.

4.2.12 Color fastness to light of textiles wetted with artificial perspiration

The color fastness to light of textiles wetted with artificial perspiration shall be tested in accordance with the method described in GB/T 14576.

4.2.13 Color fastness to phenolic yellowing

The color fastness of finished products to phenolic yellowing shall be tested in accordance with the method described in GB/T 29778.

4.2.14 Color fastness to light yellowing

The color fastness of finished products to light yellowing shall be tested in accordance with the method described in GB/T 30669-2014, and the irradiation time is 12 hours.

4.2.15 Color fastness to ozone

shall be recorded in the test report.

4.3.2.2 Test method

Adjust the spacing between the 2 clamps of the tensile machine to 100 mm ± 1 mm, the clamp width to at least 60 mm, and the clamp operating speed to 100 mm/min ± 1 mm/min. Then, respectively clamp both ends of the specimen into the clamps of the tensile machine, with the stitch line located 1/2 between the vertical lines of the 2 jaws (the pre-tension is 2 N). Start the test program, until the stich line breaks.

Record the test value of each specimen. Take the arithmetic mean of the test values of 3 specimens as the final result. The calculation result shall be rounded off to 1 N in accordance with GB/T 8170.

If 2 or more specimens in the test values of 3 specimens are qualified, take the average value of the qualified specimens as the final result of the test part and the test part will be determined as qualified in the indicator; if 2 or more specimens in the test values of 3 specimens are disqualified, take the average value of the disqualified specimens as the final result of the test part and the test part will be determined as disqualified in the indicator. If the determination results of all test parts are all qualified, the specimens will be determined as qualified in the indicator, otherwise, they will be deemed to be disqualified.

If yarn slippage or fabric breakage occurs during the test, then, it will be recorded as “yarn slippage” or “fabric breakage” in the test report.

4.3.3 Pilling performance

4.3.3.1 Sampling

Cut 5 specimens in steps from the uncoated adhesive lining part of a finished product. In accordance with the method described in GB/T 6529, conduct conditioning.

4.3.3.2 Test method

Pilling performance shall be tested in accordance with the method described in GB/T 4802.1-2008, and Parameter D shall be used. Specifically speaking, for combed wool fabrics and combed wool-like fabrics, use Parameter E; for carded wool fabrics, carded wool-like fabrics and loose-structured fabrics, use Parameter F.

4.3.4 Tearing strength

The tearing strength of denim clothing and blouses shall be tested in accordance with the method described in GB/T 3917.1. The tearing strength of other finished products shall be tested in accordance with the method described in GB/T 3917.2.

4.3.5 Breaking strength

The breaking strength of denim clothing shall be tested in accordance with the method described

in GB/T 3923.2. The breaking strength of other finished products shall be tested in accordance with the method described in GB/T 3923.1.

4.3.6 Bursting strength

The bursting strength of finished knitted fabrics shall be tested in accordance with the method described in GB/T 19976-2005, using a spherical ejector pin with a diameter of (38 ± 0.02) mm.

4.3.7 Peeled off strength of adhesive interlining

The peeled off strength of adhesive interlining of finished products shall be tested in accordance with the method described in FZ/T 80007.1.

4.3.8 Abrasion resistance

The abrasion resistance of finished products shall be tested in accordance with the method described in GB/T 21196.2. The test parts are 100 mm upward from the lower hem of the tops, 100 mm upward from the opening of the trousers, and 100 mm upward from the lower hem of the skirts. The load is (595 ± 7) g (with a nominal pressure of 9 kPa).

4.3.9 Snagging performance

The snagging performance of finished products shall be tested in accordance with the method described in GB/T 11047.

4.3.10 Humidity and heat ageing resistance

The humidity and heat ageing resistance of finished products shall be tested in accordance with the method described in GB/T 24135-2022, and Method C shall be adopted. The ageing time is 72 hours. After the test is completed, place it at room temperature for at least 1 hour. Under the D65 standard light source, in accordance with GB/T 250, assess the color changes and appearance changes of the specimen.

4.4 Washing Performance

4.4.1 Dimensional change rate

4.4.1.1 Dimensional change rate in water washing

The dimensional change rate in water washing of finished products shall be tested in accordance with the method described in GB/T 8630. The washing and drying programs shall be carried out in accordance with the stipulations of product standards or the agreement of the relevant parties. If not specified, Type-A standard washing machine and washing program 4N (for finished products with fabrics containing ≥ 50% wool or silk, adopt program 4G; for those with clarified hand washing instructions, adopt washing program 4H) in GB/T 8629-2017 may be adopted, and the drying method shall adopt Program A. During batch product inspection, randomly take 3 PCS of finished products for testing and wash them once. Take the average value of the 3 PCS as the result. If the 3 PCS have both shrinkage and elongation test results at

5 Determination of Functional Performance

5.1 Moisture Permeability

For the moisture permeability of finished products, coated products shall be tested in accordance with the method described in GB/T 12704.2-2009, Method A shall be used, and the test conditions are group a); coatings and other products shall be tested in accordance with the method described in GB/T 12704.1-2009, and the test conditions are group a).

5.2 Moisture Absorption and Quick-drying Performance

The moisture absorption and quick-drying performance of finished products shall be tested in accordance with the method described in GB/T 21655.1.

5.3 Water Resistance

The test method for water resistance is as follows:

---Method 1: spray test method: carry out the test in accordance with the method described in GB/T 4745-2012, and the test water temperature is (20 ± 2) °C.

---Method 2: hydrostatic pressure method: carry out the test in accordance with the method described in GB/T 4744-2013, and the test water temperature is 20 °C ± 2 °C.

---Method 3: rain test: exposure to a horizontal water spray: carry out the test in accordance with the method described in GB/T 23321, the test water temperature is (20 ± 2) °C, and the test water pressure is 610 mm.

---Method 4: Bundesmann rain-shower test: carry out the test in accordance with the method described in GB/T 14577.

For the washing method, adopt Type-A standard washing machine and washing program 4N in GB/T 8629-2017, add detergent once, and continuously wash for 3 cycles, or wash in accordance with the program and number of cycles agreed by the parties concerned. After continuous washing, adopt Program F for drying.

5.4 Warmth Retention Properties

The warmth retention properties of finished products shall be tested in accordance with the method described in GB/T 35762.

5.5 Flame Retardant Properties

The flame retardant properties of finished products shall be tested in accordance with the method described in GB/T 5455-2014, and Condition A shall be adopted.

5.6 Solar Ultraviolet Radiation Protective Properties

The solar ultraviolet radiation protective properties of finished products shall be tested in accordance with the method described in GB/T 18830.

5.7 Oil Repellency

The oil repellency of finished products shall be tested in accordance with the method described in GB/T 19977.

5.8 Soil Release

The soil release properties of finished products shall be tested in accordance with the method described in FZ/T 01118.

5.9 Non-iron Performance

The test of the non-iron performance of finished products shall be carried out in accordance with the stipulations of 4.4.1.1, add detergent once, and continuously wash for 5 cycles. After continuous washing, adopt Program A for drying, and carry out the test in accordance with the method described in GB/T 18863.

5.10 Anti-wrinkle Performance

The anti-wrinkle performance of finished products shall be tested in accordance with the method described in GB/T 29257.

5.11 Antistatic Performance

The antistatic performance of finished products shall be tested in accordance with the method described in GB/T 12703.3.

5.12 Prickle Resistance

The prickle resistance of finished products shall be tested in accordance with the method described in FZ/T 01158. Respectively test in the warp and weft directions, and the larger average value in the 2 directions is taken as the final result.

5.13 Anti-mosquitoes Properties

The anti-mosquitoes properties of finished products shall be tested in accordance with the method described in GB/T 30126-2013, and the repellent tester method shall be adopted.

5.14 Anti-mould Performance

The anti-mould performance of finished products shall be tested in accordance with the method described in GB/T 24346.

Method 1: petri dish method.

Method 2: suspension method.

6.1.3 Decomposable carcinogenic aromatic amine dyes

The decomposable carcinogenic aromatic amine dyes of finished products shall be tested in accordance with the method described in GB/T 17592.

6.1.4 Phthalates

The phthalates of finished products shall be tested in accordance with the method described in GB/T 20388.

6.1.5 Total lead and total cadmium

The total lead and total cadmium of finished products shall be tested in accordance with the method described in GB/T 30157.

6.1.6 Burning behavior

The burning behavior of finished products shall be tested in accordance with the method described in GB/T 14644.

6.1.7 Odor

The odor of finished products shall be tested in accordance with the method described in 6.7 of GB 18401-2010.

6.1.8 Tensile strength of accessories

The tensile strength of accessories of finished products shall be tested in accordance with the method described in Appendix A of GB/T 22704-2019. Test 5 samples of each accessory, and the single value of each sample shall reach the requirements. If there are less than 5 PCS of one type of accessory, carry out the test based on the actual number of accessories.

6.1.9 Sharpness of accessories

The sharpness of accessories of finished products shall be tested in accordance with the method described in GB/T 31702.

6.1.10 Drawstring safety

The test of clothing drawstring safety:

---Method 1: carry out the test in accordance with the method described in 5.7 of GB 31701-2015;

---Method 2: carry out the test in accordance with the method described in GB/T 22702.

6.1.11 Remains of metal needles

The remains of metal needles of finished products shall be tested in accordance with the

6.2.7 Short chain chlorinated paraffins

The short chain chlorinated paraffins of finished products shall be tested in accordance with the method described in GB/T 40263.

6.2.8 Permethrin

The permethrin of finished products shall be tested in accordance with the method described in GB/T 18412.4-2006, and the gas chromatography - mass selective detector (GC-MSD) shall be adopted.

6.2.9 Perfluorooctane sulfonic acid (PFOS) and its salts, perfluorooctane sulfonyl fluoride (PFOSF)

The perfluorooctane sulfonic acid and its salts, perfluorooctane sulfonyl fluoride of finished products shall be tested in accordance with the method described in EN 17681-1:2022.

NOTE: in textiles, the content of perfluorooctane sulfonyl fluoride is tested using perfluorooctane sulfonic acid instead, and the result of perfluorooctane sulfonyl fluoride is calculated based on perfluorooctane sulfonic acid.

6.2.10 Perfluorooctanoic acid (PFOA) and its salts

The perfluorooctanoic acid (PFOA) and its salts of finished products shall be tested in accordance with the method described in GB/T 31126.

NOTE: in textiles, the content of perfluorooctanoate is tested using perfluorooctanoic acid instead, and the result of perfluorooctanoate is calculated based on perfluorooctanoic acid.

6.2.11 Chlorinated toluene

The chlorinated toluene of finished products shall be tested in accordance with the method described in GB/T 20384.

6.2.12 Polycyclic aromatic hydrocarbons (PAH)

The polycyclic aromatic hydrocarbons of finished products shall be tested in accordance with the method described in GB/T 28189.

6.2.13 Solvent residues

The solvent residues of finished products shall be tested in accordance with the method described in GB/T 35446.

6.2.14 Vinyl chloride monomer (VCM)

The vinyl chloride monomer of finished products shall be tested in accordance with the method described in GB/T 4615.

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