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Topsheet for Disposal Sanitary Products

一次性卫生用品用面层

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Standardization Administration of the People's Republic of China.

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Topsheet for Disposal Sanitary Products

1 Scope

This document defines the terms and definitions of the topsheet for disposal sanitary products, specifies the classification and technical requirements of the topsheet for disposal sanitary products, describes the test methods for the technical requirements indexes of the topsheet for disposal sanitary products, establishes the rules for batching, sampling and inspection of the topsheet for disposal sanitary products, and provides information on marking, packaging, transportation and storage.

This document is applicable to the topsheet material used for the production of disposal sanitary products, such as: diapers (sheets and pads), sanitary napkins (pads) and women's hygiene pants, etc.

2 Normative References

The contents of the following documents constitute indispensable clauses of this document through the normative references in this 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 462 Paper, Board and Pulp - Determination of Moisture Content of Analytical Sample

GB/T 2828.1 Sampling Procedures for Inspection by Attribute - Part 1: Sampling Schemes Indexed by Acceptance Quality Limit (AQL) for Lot-by-lot Inspection

GB/T 6682 Water for Analytical Laboratory Use - Specification and Test Methods

GB/T 10739 Paper, Board and Pulps - Standard Atmosphere for Conditioning and Testing

GB 15979 Hygienic Standard for Disposable Sanitary Products

GB/T 17592 Textiles - Determination of the Banned Azo Colorants

GB/T 22898 Paper and Board - Determination of Tensile Properties - Constant Rate of Elongation Method (100 mm/min)

GB/T 23344 Textiles - Determination of 4-aminoazobenzene

GB/T 24218.6 Textiles - Test Methods for Nonwovens - Part 6: Absorption

GB/T 34448-2017 Tissue Paper and Disposable Products - Determination of Formaldehyde

GB/T 37860 Paper, Board and Paper Products - Determination of Phthalates

GB/T 35613-2017 Green Product Assessment - Paper and Paper Products

GB/T 39391-2020 Sanitary Absorbent Pants for Women

GB/T 39998 Paper, Board and Paper Products - Determination of Alkylphenol Polyethoxylates - HPLC-MS Method

3 Terms and Definitions

The following terms and definitions are applicable to this document.

3.1 Natural Fiber Topsheet

Natural fiber topsheet refers to the topsheet for disposable sanitary products processed with 100% natural fibers.

3.2 Man-made Fiber Topsheet

Man-made fiber topsheet refers to the topsheet for disposable sanitary products processed with 100% chemical fibers.

3.3 Mixed Fiber Topsheet

Mixed fiber topsheet refers to the topsheet for disposable sanitary products processed by mixing natural fibers and chemical fibers.

4 Classification

4.1 The topsheet for disposable sanitary products is divided into natural fiber topsheet, man-made fiber topsheet, mixed fiber topsheet and perforated membrane.

4.2 In accordance with purpose, the topsheet for disposable sanitary products is divided into topsheet for sanitary napkins (pads), topsheet for women's hygiene pants, topsheet for baby diapers (sheets and pads) and topsheet for adult diapers (sheets and pads).

5 Technical Requirements

5.1 Requirements for Raw Materials

In the production of the topsheet for disposable sanitary products, no toxic and harmful raw materials, no recycled raw materials, no surfactants containing perfluorooctane sulfonyl compounds (PFOS) and perfluorooctanoic acid (PFOA), and no asbestos fiber shall be used.

5.2 Requirements for Physical and Chemical Indexes

5.4 Requirements of Dimensional Deviation

The topsheet for disposable sanitary products is generally in rolls. When the roll width ≤ 200 mm, the width deviation of each roll shall not exceed ± 3 mm; when the roll width > 200 mm, the width deviation of each roll shall not exceed ± 5 mm.

5.5 Requirements of Appearance Quality

5.5.1 The surface of the topsheet for disposable sanitary products shall be clean, and free of dirt, dead folds, damage, hair loss, foreign substances, obvious stripes and cloud spots. The topsheet of natural fiber topsheet, chemical fiber topsheet and mixed fiber topsheet shall not have rigid wires. The perforation of perforation materials shall be full and regular; the number of blind holes on the perforated membrane within 2 m along the length direction shall not exceed 6, and there shall be no blind holes greater than or equal to 1 mm^2.

5.5.2 The color of the topsheet for disposable sanitary products shall be uniform, and there shall be no obvious chromatic aberration among the same batch of materials. The natural fiber topsheet, man-made fiber topsheet and mixed fiber topsheet shall not manifest any color change; colored or printed products shall not be discolored.

5.5.3 The cutting edge of the topsheet of disposable sanitary products shall be neat and shall not be stained with scraps of paper.

5.5.4 There shall be no more than 2 joints on the topsheet of each roll of disposable sanitary products; the space between two adjacent joints shall not be less than 100 m. The joints shall be glued with a colored tape, with both ends being visible.

6 Test Methods

6.1 Specimen Collection and Processing

When testing the quantitative deviation, tensile strength, absorption time and residual liquid amount, the processing shall be carried out in accordance with the stipulations of GB/T 10739.

6.2 Quantitative Deviation

Use a round knife cutter or a square die equipped with a cutter to cut at least 3 pieces of specimen from the sample, each with an area of at least 0.05 m^2. Use a balance with a division value of 0.001 g to weigh the mass of each specimen; calculate the mass per unit area of each specimen. Take the average value of the mass per unit area of 3 pieces of specimen to express the quantitative value of the specimen, expressed in (g/m^2). The quantitative deviation is expressed by the result of the difference between the quantitative test value and the nominal quantitative value divided by the nominal quantitative value and expressed in %; the result is accurate to an integer.

6.3 Tensile Strength (longitudinal)

The tensile strength (longitudinal) shall be determined in accordance with GB/T 22898; the tensile speed is 100 mm/min. During sampling, take 5 specimens along the longitudinal direction of the sample; the width of the specimen is (50 ± 0.5) mm; the length shall satisfy the clamping distance of at least 100 mm.

6.4 Absorption Time and Residual Liquid Amount

The absorption time and residual liquid amount shall be determined in accordance with Appendix A.

6.5 pH

pH shall be determined in accordance with Appendix B.

6.6 Movable Fluorescent Substances

The movable fluorescent substances shall be determined in accordance with Appendix C.

6.7 Formaldehyde Content

The formaldehyde content shall be determined in accordance with the high-performance liquid chromatography in GB/T 34448-2017.

6.8 Alkylphenol Polyoxyethylene Ether Content

The alkylphenol polyoxyethylene ether content shall be determined in accordance with GB/T 39998.

6.9 Decomposable Carcinogenic Aromatic Amine Dye Content

The decomposable carcinogenic aromatic amine dye content shall be determined in accordance with GB/T 17592 and GB/T 23344. Generally speaking, it shall be firstly detected in accordance with GB/T 17592; when aniline and / or 1,4-phenylenediamine is detected, it shall be detected in accordance with GB/T 23344.

6.10 Adsorbable Organic Halogen (AOX) Content

The adsorbable organic halogen (AOX) content shall be determined in accordance with Appendix C in GB/T 35613-2017.

6.11 Phthalates Content

The phthalates content shall be determined in accordance with GB/T 37860.

6.12 Delivery Moisture

The delivery moisture shall be determined in accordance with GB/T 462.

6.13 Hygiene Indexes

The hygiene indexes shall be determined in accordance with GB 15979.

6.14 Dimensional Deviation

From the outermost layer of a roll of product, remove 5 layers; use a steel ruler with an accuracy of 0.5 mm for measurement. The ruler is perpendicular to the selvage; read the width value (accurate to 1 mm); measure three points for each roll; take the average value as the measured value of the roll. Then, calculate the deviation between the measured value and the nominal value.

6.15 Appearance Quality

The appearance quality shall be subjected to visual inspection.

7 Batching, Sampling and Inspection Rules

7.1 Take one delivery as one batch, but each batch shall not exceed 5,000 rolls.

7.2 The manufacturer shall ensure that the produced products comply with the requirements of this document.

7.3 The sampling procedures for inspection by attribute shall be carried out in accordance with the stipulations of GB/T 2828.1; the sample unit is roll. Acceptance quality limits (AQL): for pH, movable fluorescent substances, formaldehyde content, alkylphenol polyoxyethylene ether content, adsorbable organic halogen (AOX) content, phthalates content, decomposable carcinogenic aromatic amine dye content, absorption time and residual liquid amount, the acceptance quality limit is 4.0; for quantitative deviation, tensile strength, delivery moisture, dimensional deviation and appearance quality, the acceptance quality limit is 6.5. The sampling scheme shall adopt secondary sampling scheme for normal inspection; the inspection level is general inspection level I. See Table 2.

the second sample shall be cumulated. If the cumulative number of disqualified products is less than or equal to the second accepted number in Table 2, then, the batch shall be determined as qualified; if the cumulative number of disqualified products is greater than or equal to the second rejected number in Table 2, then, the batch shall be determined as disqualified.

8 Marking, Packaging, Transportation and Storage

8.1 Product Marking and Packaging

8.1.1 The following contents shall be marked on the product package:

a) product name;

b) fiber composition;

c) winding direction or skin contact surface orientation;

d) enterprise's name, address and contact information;

e) quantitative value, product type, specification, quantity and net weight;

f) production date and shelf life or production batch No. and expiry date of use;

g) serial No. of this document.

8.1.2 Packaging materials in direct contact with the topsheet for disposable sanitary products shall be clean, non-toxic and harmless. The topsheet for disposable sanitary products shall not be exposed, so as to ensure that the products are not contaminated.

8.1.3 The topsheet for each disposable sanitary product shall be accompanied by a product quality certificate.

8.2 Product Transportation and Storage

8.2.1 Transport and storage conditions shall be indicated on the product packaging.

8.2.2 During transportation, the topsheet for disposable sanitary products shall use tools with protective measures, so as to prevent heavy pressure, collision with sharp objects, and exposure to the sun and rain.

8.2.3 The topsheet for disposable sanitary products shall be stored in a dry and well-ventilated room that is not exposed to direct sunlight, so as to prevent the impact of rain, snow and ground moisture. In addition, it shall not co-exist with polluting or toxic chemicals.

Description of indexes:

L---left;

R---right.

Figure A.1 -- Schematic Diagram of Curved Specimen Holder and Standard Test Module

A.2.2 Standard synthetic test solution: see Appendix B of GB/T 39391-2020 for the formulation method and physical property requirements.

A.2.3 Distilled or deionized water.

A.2.4 Absorbent paper: quantitative value: (145 ± 5) g/m^2; the liquid absorption amount is greater than 480% (determine in accordance with GB/T 24218.6).

A.3 Specimen Collection

Take 5 specimens from each sample. The size of the specimens: length: 100 mm; width: 80 mm.

A.4 Test Procedures

A.4.1 Place the sanitary napkin absorption speed tester (A.2.1) in a horizontal position; pour a sufficient amount of the standard synthetic test solution (A.2.2) into the liquid storage tank. Actuate the instrument; click the “Rinse” button to rinse twice. In accordance with the specifications of the instrument manual, calibrate the liquid filling volume of the automatic liquid filling device.

A.4.2 Remove the curved specimen holder from the sanitary napkin absorption speed tester; place it on a horizontal table. Take a piece of specimen; weigh its mass as m_1. Back it with 15 layers of absorbent paper of the same size as the specimen. Gently place it in the curved test area of the curved specimen holder, with the skin-friendly side of the specimen facing up and the center point of the specimen aligned with the corresponding line of the liquid outlet on the base. Then, place the specimen holder in the fixed position of the sanitary napkin absorption speed tester.

A.4.3 Enter the test interface of the sanitary napkin absorption speed tester, set the total thickness of the specimen and the absorbent paper, so as to ensure that the standard test module can freely fall to the surface of the specimen. Click “Test”; the automatic liquid filling device adds (5.0 ± 0.1) mL of the standard synthetic test solution to the standard test module. The timer automatically starts timing, until the liquid level disappears at the lowest point of the absorption zone, then, it automatically stops.

A.4.4 1 min after the automatic timer stops, use a clean paper towel to wipe the bottom of the standard test module; remove the curved specimen holder, and the tested specimen and absorbent paper; re-weigh the mass of the specimen as m_2. Prepare for the next test; repeat the steps A.4.2 ~ A.4.4

Appendix B

(normative)
pH Determination

B.1 Reagents and Materials

Unless it is otherwise specified, only analytically pure reagents shall be used.

B.1.1 Water: GB/T 6682, Grade-3.

B.1.2 Normal saline: 0.9% sodium chloride solution. Weigh-take 9.00 g (accurate to 0.01 g) of sodium chloride in a 1,000 mL volumetric flask; dissolve it, then, add water to the scale and shake it well.

B.1.3 Standard buffer solution: at 25 °C, pH is 4.00, 6.86 and 9.18.

B.2 Instruments

B.2.1 pH meter: with an accuracy of 0.01.

B.2.2 Balance: the maximum measuring range: 500 g; division value: 0.01 g.

B.2.3 Thermometer: measuring range: 0 °C ~ 100 °C; division value: 1.0 °C.

B.2.4 Beaker: with a volume of 100 mL.

B.2.5 Measuring cylinder: with a volume of 100 mL.

B.2.6 Volumetric flask: 1,000 mL.

B.2.7 Stainless steel scissors.

B.2.8 G1 glass sand core funnel.

B.2.9 Stopwatch.

B.3 Test Procedures

At room temperature, cut (1.0 ± 0.1) g of specimen, place it in a 100 mL beaker (B.2.4). Add 100 mL of normal saline (B.1.2) and start timing. Firstly, use a glass rod to thoroughly mix the specimen with the normal saline, then, let it stand. At 10 min, re-stir it and use a G1 glass sand core funnel (B.2.8) to filter it; put the pH meter (B.2.1) test electrode into the filtrate to test and read the pH value.

B.4 Calculation of Test Result

Appendix C

(normative)

Determination of Movable Fluorescent Substances

C.1 Reagents and Materials

Unless it is otherwise specified, only analytically pure reagents shall be used.

C.1.1 Water: GB/T 6682, Grade-3.

C.1.2 Gauze: pure cotton material, size: approximately 5 cm × 5 cm.

C.1.3 Ammonia water: 0.1%.

C.1.4 Hydrochloric acid solution: 10%.

C.1.5 Extraction solution: pH 7.5 ~ 9.0 water adjusted with 0.1% ammonia water (C.1.3).

C.1.6 Fluorescence standard sample: the fluorescence is uniform; the fluorescence brightness is 0.40% ~ 0.60%.

NOTE: except for the fluorescence standard sample, the reagents and materials used shall be non-fluorescent under UV light.

C.2 Instruments

C.2.1 Balance: division value: 0.001 g.

C.2.2 Erlenmeyer flask: 250 mL.

C.2.3 G1 glass sand core funnel.

C.2.4 Glass watch glass.

C.2.5 UV light: wavelengths: 254 nm and 365 nm, with a device for eye protection.

C.2.6 pH meter: with an accuracy of 0.01.

C.2.7 Constant-temperature water bath: with a temperature control accuracy of (40 ± 2) °C.

C.3 Test Procedures and Result Report

C.3.1 Randomly take a stack of specimens from the sample; place the specimens and the fluorescence standard sample (C.1.6) together at about 20 cm under the UV light (C.2.5); compare and observe the fluorescence phenomenon of the specimen and the fluorescence standard sample. If the fluorescence phenomenon of the specimen is weaker than that of the

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