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Paper Towel

纸巾

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Table of Contents

Paper Towel

1 Scope

This document specifies the classification, raw materials, requirements, test methods, inspection rules, marking, packaging, transportation and storage of paper towels.

This document is applicable to various facial tissues, paper napkins and paper handkerchiefs used in daily life.

This document does not apply to wet wipes, paper hand towels and kitchen towels.

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 450 Paper and Board - Sampling for Testing and Identification of Machine and Cross Direction, Wire Side and Felt Side

GB/T 461.1 Paper and Board - Determination of Capillary Rise (Klemm method)

GB/T 462 Paper, Board and Pulp - Determination of Moisture Content of Analytical Sample

GB/T 465.2 Paper and Board - Determination of Tensile Strength after Immersion in Water

GB/T 742 Fibrous Raw Material, Pulp, Paper and Board - Determination of Residue (ash) on Ignition at 575 °C and 900 °C

GB/T 1541 Paper and Board - Determination of Dirt

GB/T 2828.1 Sampling Procedures for Inspection by Attributes - 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 7974 Paper, Board and Pulps - Measurement of Diffuse Blue Reflectance Factor - D65 Brightness (Diff / Geometry, Outdoor daylight conditions)

GB/T 8942 Paper - Determination of Softness

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

4 Classification

4.1 In accordance with the purposes, paper towels are classified into facial towels (facial tissues), paper napkins (napkins) and paper handkerchiefs (handkerchief papers).

4.2 In accordance with the raw materials, paper towels are classified into primary wood pulp (fiber) paper towels, primary non-wood pulp (fiber) paper towels and primary mixed pulp (fiber) paper towels.

NOTE 1: primary wood pulp (fiber) paper towels refer to paper towels whose fiber raw material is 100% primary wood pulp (fiber).

NOTE 2: primary non-wood pulp (fiber) (such as: straw pulp, bamboo pulp and bagasse pulp, etc.) paper towels refer to paper towels whose fiber raw material is 100% primary non-wood pulp (fiber).

NOTE 3: primary mixed pulp (fiber) paper towels refer to paper towels produced by mixing primary wood pulp (fiber) and primary non-wood pulp (fiber).

4.3 In accordance with the product performance, paper towels are classified into ordinary paper towels, soft paper towels, wet reinforced paper towels, dispersible paper towels and moisturizing paper towels. Among them, the ordinary paper towels are further classified into superior products and qualified products.

NOTE: moisturizing paper towels refer to paper towels that add a certain amount of moisturizing ingredients and have a soft and smooth surface.

4.4 In accordance with the number of layers, paper towels are classified into single-layer, double-layer and multi-layer.

4.5 In accordance with the color, paper towels are classified into white paper towels, natural-color paper towels and colored paper towels. Among them, colored paper towels are further classified into printed paper towels and dyed paper towels.

4.6 In accordance with the process, paper towels are classified into embossed paper towels and non-embossed paper towels.

5 Raw Materials

5.1 Paper towels shall use non-toxic and harmless raw materials. During printing, water-based inks shall be used. Paper towels shall use primary fiber raw materials, such as: wood, grass and bamboo, etc. Any recycled papers, paper prints, paper products and other recycled fibrous substances shall not be used as raw materials, and deinking agent shall not be used.

5.2 If essence is added during the production of paper towels, the essence used shall comply with the stipulations of GB/T 22731. If moisturizing ingredients are added during the

7 Test Method

7.1 Sample Collection and Treatment

Sampling shall be conducted in accordance with GB/T 450.

When determining the quantification and quantitative deviations, transverse suction height, transverse tensile strength, longitudinal wet tensile strength, softness, powder shedding rate and dimensional deviations, the sample treatment and the standard atmospheric conditions of the test shall comply with the stipulations of GB/T 10739.

7.2 Quantification and Quantitative Deviations

The quantification and quantitative deviations shall be determined in accordance with GB/T 24328.5, and the results shall be expressed in single-layer.

7.3 D65 Brightness

The D65 brightness shall be determined in accordance with GB/T 7974.

7.4 Migratable Fluorescent Substance

Place a stack of specimen (thick enough to be opaque) and a fluorescent standard sample (with a fluorescent brightness of 0.40% ~ 0.60%) together at a distance of about 20 cm under an ultraviolet lamp with wavelengths of 254 nm and 365 nm; compare and observe the fluorescence phenomenon on both sides of the specimen and the fluorescent standard sample. If the fluorescence phenomenon of the specimen is weaker than that of the fluorescent standard sample, then, end the test and report the test result as no migratable fluorescent substance; if the fluorescence phenomenon of the specimen is stronger than that of the fluorescent standard sample, then, in accordance with Chapter 5 of GB/T 27741-2018, conduct the determination of the migratable florescent substance.

7.5 Ash Content

The ash content shall be determined in accordance with GB/T 742, and the burning temperature is (575 ± 25) °C.

7.6 Transverse Suction Height

The transverse suction height shall be determined in accordance with GB/T 461.1. The test duration is 100 s. Conduct the determination in accordance with the number of layers of finished products.

7.7 Transverse Tensile Strength

The transverse tensile strength shall be determined in accordance with GB/T 24328.3. The width of the specimen is 15 mm, and the clamping distance is 100 mm. For single-layer, double-

layer or multi-layer specimens, determine in accordance with the number of layers of finished products.

NOTE: if the length of the specimen cannot satisfy the test using a 100 mm clamping distance, use a 50 mm clamping distance for the test instead.

7.8 Longitudinal Wet Tensile Strength

7.8.1 Manual method

In accordance with GB/T 465.2, conduct the determination. The width of the specimen is 15 mm, and the clamping distance is set to 100 mm; conduct the determination in accordance with the number of layers of finished products. Before the test, pre-treatment shall be carried out first. Place the specimen in a drying oven at (105 ± 2) °C for 15 min, take it out, equilibrate it under the atmospheric conditions specified in GB/T 10739 for at least 1 h, then, carry out the test. During the test, clamp the specimen on a horizontal tensile machine, so that the specimen is kept straight but not stressed. Use a rubber dropper to continuously add two drops of water (about 0.1 mL in total) to the center of the specimen. The vertical distance between the water outlet of the rubber dropper and the specimen is about 1 cm. Start timing while dripping water, after 5 s, use a three-layer Type 102 medium-speed qualitative filter paper (for single-layer specimen, use a four-layer qualitative filter paper) to gently touch the bottom of the specimen for 3 s ~ 4 s, so as to absorb excess water on the surface of the specimen; the qualitative filter paper cannot be repeatedly used. After the water is dried, immediately start the tensile machine; the entire operation (from dripping water to the end of the tensile test) should be completed within 35 s (in which, the stretching time shall not be less than 5 s). Take 10 valid test values and calculate their average value. The results shall be expressed as the test value of finished product layers.

7.8.2 Automatic method

In accordance with the horizontal test method in GB/T 24328.4-2020, conduct the determination. The results shall be expressed as the test value of finished product layers. Adopt a tensile tester that enables automatic immersion, and the water immersion time of the specimen is 5 s.

7.9 Softness

The softness shall be determined in accordance with GB/T 8942. The width of the slit of the instrument is set to 5 mm, and the specimen is cut into 100 mm × 100 mm. If the specimen size does not reach 100 mm, convert it to 100 mm and report the result. Paper towels shall be tested in accordance with the finished product layer, whether it is an embossed or non-embossed specimen, the layers shall be uncovered, and then, overlapped for determination. For the same sample, respectively determine at least 6 specimens in the transverse and longitudinal directions and report the test results as the average value of the transverse and longitudinal directions. For folded samples, try to avoid the folded part during sample cutting and testing, but if there is a conflict between the specimen size and avoiding the folds, give priority to the specimen size. For embossed products, if the embossed part cannot be avoided within the sampling area (100

Technical Specifications (Edition 2015); the method of microwave digestion shall be adopted for sample treatment. During arbitration, 1.6 in Chapter 4 of *Cosmetics Safety Technical Specifications* (Edition 2015) shall be adopted for determination.

7.14 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. The list of decomposable carcinogenic aromatic amines shall comply with Appendix C. Generally, conduct the detection in accordance with GB/T 17592; when aniline and / or 1,4-phenylenedimine is detected, conduct the detection in accordance with GB/T 23344.

7.15 Formaldehyde content

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

7.16 Decolorization performance

The decolorization performance shall be determined in accordance with Appendix D.

7.17 Holes

Use both hands to hold the two corners of a single-layer specimen and observe it against the light; read the number of holes within the specified range. For double-layer or multiplayer specimens, each layer shall be determined. The test area of each specimen shall not be less than 0.5 m^2, then, convert it into the number of holes per square meter. If there is a hole larger than 5 mm, the test area shall not be less than 1 m^2.

7.18 Dirt Count

The dirt count shall be determined in accordance with GB/T 1541. For double-layer or multi-layer specimens, only the side of the upper and lower surfaces facing outward shall be determined, and the test area of each sample (the total area of the upper and lower surfaces) shall not be less than 0.5 m^2; for single-layer specimens, both sides shall be determined, and the test area of each sample (the area of both the front and back sides shall be included) shall not be less than 0.5 m^2.

7.19 Delivery Moisture

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

7.20 Hygiene Requirements

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

7.21 Internal Capacity Shortage

The internal capacity shortage shall be determined through the counting method. During the test, the outer package shall be removed for visual counting; for each sample, test 3 complete packages, and the result shall be expressed as the maximum shortage.

7.22 Dimensional Deviations

From any package, take 10 specimens; use a steel ruler with a division value of 1 mm to measure the length and width of each specimen, and respectively calculate the average value. Subtract the nominal value from the average value to express the dimensional deviations, and the result shall be rounded off to an integer.

7.23 Appearance Quality

Conduct visual inspection on the appearance quality.

8 Inspection Rules

8.1 Inspection Classification

8.1.1 Exit-factory inspection

Before exiting the factory, the products shall be inspected batch by batch in accordance with the requirements of this document, and they can only be allowed to exit the factory after they comply with the requirements.

8.1.2 Type inspection

The same type of products produced with the same raw materials and the same process shall be subject to no less than one type inspection every two years. Under one of the following circumstances, type inspection shall also be carried out:

a) When there are significant changes in raw materials and process;

b) When products are put into production for the first time, or when the production is resumed after more than 6 months of suspension;

c) When the production site changes;

d) When there is a large difference between the results of exit-factory inspection and the previous type inspection;

e) When the national quality supervision institution requests type inspection.

8.2 Inspection Items

The exit-factory inspection items are routine inspection items, and the type inspection items include all inspection items (except for those specially regulated). See Table 2 for details.

If the physical and chemical properties indexes of the samples respectively satisfy the requirements in 6.1, then, they shall be determined as qualified, otherwise, they shall be determined as disqualified.

8.4.1.2 Hygiene requirements

If the hygiene requirements of the samples satisfy the requirements in 6.2, then, it shall be determined as qualified, otherwise, it shall be determined as disqualified.

8.4.1.3 Internal capacity shortage

If the internal capacity shortage of the samples satisfies the requirements in 6.3, then, it shall be determined as qualified, otherwise, it shall be determined as disqualified.

8.4.1.4 Dimensional deviations

If the dimensional deviations of the samples satisfy the requirements in 6.4, then, it shall be determined as qualified, otherwise, it shall be determined as disqualified.

8.4.1.5 Appearance quality

If the appearance quality of the samples satisfies the requirements in 6.5, then, it shall be determined as qualified, otherwise, it shall be determined as disqualified.

8.4.2 Batch determination

Among all the inspection items, if the inspection results of hygiene requirements are disqualified, then, the batch shall be determined as disqualified; the number of samples for the first inspection of physical and chemical properties, internal capacity shortage, dimensional deviations and appearance quality shall be equal to the first sample size provided in the scheme. If the number of disqualified products found in the first sample is less than or equal to the first acceptance number in Table 3, then, the batch shall be determined as qualified; if the number of disqualified products found in the first sample is greater than or equal to the first rejection number in Table 3, then, the batch shall be determined as disqualified. If the number of disqualified products found in the first sample is between the first acceptance number and the first rejection number in Table 3, the second sample of the sample size provided by the scheme shall be inspected, and the number of disqualified products found in the first and second samples shall be accumulated. If the accumulative number of disqualified products is less than or equal to the second acceptance number in Table 3, then, the batch shall be determined as qualified; if the accumulative number of disqualified products is greater than or equal to the second rejection number in Table 3, then, the batch shall be determined as disqualified.

9 Marking and Packaging

9.1 Product Sales Package Marking

In addition to complying with GB 38598, the product sales package marking shall also include

the following contents:

---Serial No. of executed standard;

---Main raw materials of the product:

- Primary wood pulp (fiber) products are marked with “primary wood pulp”; primary non-wood pulp (fiber) products are marked with “primary straw pulp” or “primary bamboo pulp” or “primary bagasse pulp”; primary mixed pulp products are marked with “primary wood pulp and primary bamboo pulp (or primary straw pulp)”, etc.;

- Moisturizing paper towels shall also be marked with the names of the main moisturizing ingredients added, with “main moisturizing ingredients” as the introduction; the ingredients with a content of more than 1.0% (mass fraction) in the formula of moisturizing ingredients shall be listed in a descending order of the content of each ingredient in the product formula;

---Product types: soft paper towels, wet reinforced paper towels, dispersible paper towels and moisturizing paper towels; ordinary products do not need to be marked with the product type;

---Product grade (only marked on the ordinary type);

---Product specifications (dimensions and number of layers);

---Net content (such as: number of pieces, number of sheets, number of draws and number of groups);

---Product conformity mark.

9.2 Product Transport Package Marking

In addition to complying with GB 38598, the product transport package marking shall also include the following contents:

---Net content (such as: number of draws, number of packs and number of groups);

---Pictorial marking for packaging, storage and transportation.

9.3 Packaging

9.3.1 The packaging of paper towels shall be dust-proof, moisture-proof and mildew-proof, etc.

9.3.2 The packaging materials that are in direct contact with the product shall be non-toxic, harmless and clean. Packaging materials containing polyvinyl chloride shall not be used. The product packaging shall be intact, and the packaging materials shall have sufficient air-tightness and firmness, so as to achieve the purpose of ensuring that the product will not be contaminated

circumferential surface of the disc.

A.2 Specimen Collection

Randomly take a pack (box) of paper towels, and cut two specimens (finished product layer) of 100 mm × 100 mm. The specimens taken shall be representative. If the width of the specimen is less than 100 mm, then, take a specimen with an area of 0.01 m^2.

A.3 Test Procedures

A.3.1 Adjust the instrument level and check the instrument to ensure that the instrument is functioning normally.

A.3.2 Fill the plum blossom shaped cylinder with tap water and make the water volume in the cylinder reach (5.0 ± 0.1) L. Turn on the compressed air, set the pressure to (0.40 ± 0.02) MPa and the air flow to (10.0 ± 0.8) L/min, so that the air bubbles evenly pass through the air holes into the water in the cylinder. Start the rotor and set the rotation speed of the rotor to (350 ± 1) r/min. After the vortex in the cylinder stabilizes, the height from the water surface to the bottom of the vortex is about one third of the total height of the water surface in the cylinder. Set the test duration to 40 s and put the specimen into the center of the vortex in the cylinder; when placing it, make sure that the paper surface is perpendicular to the water level, and at the same time, start timing. After 40 s, turn off the motor and stop the ventilation. Observe whether there is one or more fragments of the specimen in the cylinder. If the specimen sinks to the bottom of the cylinder during the test, and the specimen is broken by the rotor at the bottom, then, the test is invalid and needs to be re-performed. If two tests are invalid, it is advisable to appropriately increase the gas flow or reduce the rotor speed; indicate it in the report.

A.3.3 After the test is completed, drain all the water and specimen debris in the cylinder, clean the cylinder wall and the rotor, and prepare for the next test. If the debris cannot be completely discharged after one wash, multiple washes shall be performed.

A.3.4 For each sample, test two specimens.

A.4 Test Report

If the test results of two specimens show one or more fragments, then, report the test results of the sample as dispersible; if the test result of one of the two specimens shows that there is no one or more fragments, then, re-take two specimens for the test. If the test results of two re-selected specimens show one or more fragments, then, report the test results of the sample as dispersible, otherwise, report the test results of the sample as non-dispersible.

Appendix D

(normative)

Determination of Decolorization Performance

D.1 Reagents

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

D.1.1 Water, GB/T 6682, Grade-3.

D.1.2 Sodium chloride (NaCl).

D.1.3 Urea [$(NH_2)_2CO$].

D.1.4 Lactic acid ($C_3H_6O_3$).

D.1.5 1% sodium hydroxide solution; the mass fraction of sodium hydroxide (NaOH) is 1%.

D.1.6 Dipotassium hydrogen phosphate trihydrate ($K_2HPO_4 \bullet 3H_2O$).

D.1.7 Potassium carbonate (K_2CO_3).

D.1.8 Potassium chloride (KCl).

D.1.9 Magnesium chloride hexahydrate ($MgCl_2 \bullet 6\ H_2O$).

D.1.10 Calcium chloride dihydrate ($CaCl_2 \bullet 2H_2O$).

D.1.11 1% hydrochloric acid solution; the volume fraction of hydrochloric acid is 1%.

D.2 Instruments and Equipment

D.2.1 Analytical balance, with an accuracy of 0.001 g.

D.2.2 pH meter, with an accuracy of 0.01 unit.

D.2.3 Colorimetric tube, with a volume of 50 mL.

D.2.4 Thermostat water bath.

D.2.5 Other conventional laboratory glass instruments.

D.3 Test Procedures

D.3.1 Preparation of simulated perspiration

Dissolve 5.08 g of sodium chloride (D.1.2), 1.0 g of urea (D.1.3) and 1.0 g of lactic acid (D.1.4) in 900 mL of water (D.1.1), stir, until it is completely dissolved. Immerse the electrode of the

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