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

GB/T 3830-2024

Calendered film and sheet from flexible polyvinyl chloride

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1 Scope

GB/T 3830-2024 is the product standard for calendered flexible PVC film and sheet - the material of tablecloths, stationery covers, upholstery facings, packaging, banners and a great deal of general-purpose sheeting. It is made by passing the compound through heated rolls, which is the cheapest way to produce wide film at high output, and its properties are governed almost entirely by the plasticiser: how much is in it, which one, and whether it stays put. Plasticiser migration is what makes a flexible PVC article stiffen and crack over years, and it is also the route by which the plasticiser reaches whatever the film is in contact with, which is why phthalate content in this material has attracted regulatory attention. None of that is visible in a sample on a shelf. This document specifies the requirements for the classification, appearance, dimensions and physical and chemical properties of calendered flexible PVC film and sheet, together with the associated test and inspection provisions. Under ICS 83.140.10 and CCS G33, it is written for PVC film producers, for the converters and manufacturers who buy it, and for the quality and product safety authorities.

This document specifies the requirements for the classification, appearance, dimensions and physical and chemical properties of calendered film and sheet from flexible polyvinyl chloride (hereinafter referred to as "products"), describes the test methods for the products, and specifies the product inspection rules, marking, packaging, transportation and storage requirements. This document is applicable to the production, inspection and sales of smooth-surface or light-patterned calendered films and sheets from flexible polyvinyl chloride produced by the method of calendering by adding plasticizers, stabilizers and other additives to suspension polyvinyl chloride resin.

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 1040.3 Plastics - Determination of Tensile Properties - Part

3 Terms and Definitions

The terms and definitions defined in GB/T 2035-2008 are applicable to this document.

4 Product Classification

- 4.1 The classification of products by thickness is shown Table 1.
- 4.2 The classification of products by haze is shown Table 2.
- 4.3 The classification of products by purposes is shown Table 3.
- 4.4 The classification of products by whether subsequent printing is required is shown Table 4.

5 Requirements

- 5.1 Appearance The appearance shall comply with the provisions of Table 5, and the cumulative allowable number and dispersion of black spots and impurities shall comply with the provisions of Table
- 6. When there is an overlap in product categories, the category with the highest indicator requirements shall be followed. There shall be no joints in the middle of the product roll.

6 Test Methods

- 6.1 Sampling The samples shall be randomly selected from each batch of delivered products. After removing at least 5 layers of the surface of the sampled roll, the samples shall be cut, and the longitudinal direction of the product shall be marked on the samples.
- 6.2 Specimen Conditioning and Test Environment Unless otherwise specified, under the standard environment of temperature (23 ± 2) °C and relative humidity (50 ± 10) % specified in GB/T 2918, the specimen conditioning time shall be not less than 4 h, and the test shall be carried out under this condition.
- 6.3 Appearance Visually inspect under natural light and measure with corresponding measuring tools. The particle size of black spots and impurities shall be measured with a 10-fold or more magnifying glass with a minimum division value of not less than 0.1 mm.
- 6.4 Thickness In accordance with the provisions of GB/T 6672, carry out the test.
- 6.5 Width and Length In accordance with the provisions of GB/T 6673, carry out the test.
- 6.6 Tensile Strength and Tensile Fracture Strain (or tensile fracture nominal strain) Test in accordance with the provisions of GB/T 1040.3. Use Type 2 specimen with a width of (10.0 ± 0.2) mm and a test speed of (200 ± 10) mm/min. The test results are expressed as the arithmetic mean of all measured values of the specimen, with the tensile strength retained to the first decimal place and the tensile fracture strain (or tensile fracture nominal strain) retained to the integer place.

6.7 Right Angle Tear Strength Test in accordance with the provisions of QB/T 1130. Take a single piece specimen and retain the integer place.

6.8 Dimensional Change Rate Test in accordance with the provisions of GB/T 12027. The test temperature is (100 ± 2) °C and the duration is 30 min.

6.9 Heating Loss Rate Cut 3 specimens of 40 mm × 60 mm, place the group of specimens in a desiccator for 24 hours, then, take them out, and weigh them piece by piece to an accuracy of

0.1 mg. Place the group of specimens in a non-air-blasting oven at (100 ± 2) °C, hang the specimens on the same horizontal plane with a distance of no more than 80 mm from the temperature measuring device, and no less than 50 mm from the edge of the oven. The distance among the specimens shall be no less than 30 mm. After 6 hours of constant temperature, take them out and immediately place them in a desiccator to cool to room temperature. Weigh them piece by piece again to an accuracy of

0.1 mg. The heating loss rate is calculated in accordance with Formula (1). Where, n

---the heating loss rate; m_0

---the mass of the specimen before heating, expressed in (g); m

6.13 Migratable Elements Prepare and extract in accordance with the provisions of

8.2 in GB 6675.4-2014, and determine in accordance with the provisions of GB/T 22930.1.

6.14 Short Chain Chlorinated Paraffins Test in accordance with the provisions of GB/T 40263.

6.15 Haze Test in accordance with the provisions of GB/T 2410.

6.16 Wetting Tension Test in accordance with the provisions of GB/T 14216.

6.17 Low-temperature Elongation Test in accordance with the method in Appendix A.

6.18 Cold-cracking Temperature Test in accordance with the provisions of GB/T 41792.

7 Inspection Rules

7.1 Batch Products are inspected in batches. Products produced with the same equipment, of the same category, formula, thickness and width are considered a batch. The quantity of each batch shall not exceed the shift output or 8 t.

7.2 Sampling The inspection of appearance and dimensions shall be carried out in accordance with the provisions of GB/T 2828.1-2012, using a secondary sampling scheme with general inspection level II and acceptance quality limit AQL of 6.5. The batch, sample, and judgment array are shown in Table 11. The physical and chemical properties shall be