GB

NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

ICS 59.080.30

W 59

GB/T 33276-2016

Knitted fabrics and knitted composite fabrics for automotive interior

汽车装饰用针织物及针织复合物

Issued on: December 13, 2016 **Implemented on: July 01, 2017**

Issued by: General Administration of Quality Supervision, Inspection and Quarantine;
Standardization Administration of the People's Republic of China.

Table of Contents

Knitted fabrics and knitted composite fabrics for automotive interior

1 Scope

This Standard specifies the product classification, technical requirements, inspection methods, inspection rules, marking, packaging, transportation and storage of knitted fabrics and knitted composite fabrics for automotive interior.

This Standard applies to knitted fabrics and knitted composite fabrics for automotive interior, such as canopies, sun visors, door panels, seats, which are mainly textile fiber raw materials, and processed by knitting technology.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only the dated version applies to this document. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 250, Textiles - Tests for colour fastness - Grey scale for assessing change in colour

GB/T 2912.2-2009, Textiles - Determination of formaldehyde - Part 2: Released formaldehyde (vapour absorption method)

GB/T 3820, Determination of thickness of textiles and textile products

GB/T 3917.3, Textiles - Tear properties of fabrics - Part 3: Determination of tear force of trapezoid-shaped test specimens

GB/T 3920, Textiles - Tests for colour fastness - Colour fastness to rubbing

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 4666, Textiles - Fabrics - Determination of width and length

GB/T 4669-2008, Textiles - Woven fabrics - Determination of mass per unit length and mass per unit area

GB/T 4745, Textiles - Testing and evaluation for water resistance - Spray test method

GB/T 5713, Textiles - Tests for colour fastness - Colour fastness to water

GB/T 6529, Textiles - Standard atmospheres for conditioning and testing

GB/T 8170, Rules of rounding off for numerical values & expression and judgment of limiting values

GB 8410, Flammability of automotive interior materials

GB/T 13773.1, Textiles - Seam tensile properties of fabrics and made-up textile articles - Part 1: Determination of maximum force to seam rupture using the strip method

GB/T 14801, Test method for skewness and bow in woven and knitted fabrics

GB/T 16991-2008, Textiles - Test for colour fastness - Colour fastness and ageing to artificial light at high temperatures: Xenon arc

GB 18186-2000, Fermented soy sauce

GB/T 19977, Textiles - Oil repellency - Hydrocarbon resistance test

GB/T 21196.2, Textiles - Determination of the abrasion resistance of fabrics by the Martindale method - Part 2: Determination of specimen breakdown

FZ/T 01118, Textiles - Testing and evaluation for anti-soil properties - Soil release

FZ/T 01128, Textiles - Determination of abrasion resistance - Double-head method

FZ/T 60045-2014, Textile trim materials in the interior of automobiles - Test method for fogging characteristics

3 Terms and definitions

The following terms and definitions are applicable to this document.

3.1 Knitted laminated fabrics for automotive interior

Cohere the knitted fabrics with polyurethane foam or knitted fabrics, non-woven fabrics and the like to form two or more layers of composite for automotive interior.

6 Test method

6.1 Inherent quality

6.1.1 Thickness deviation rate

Perform according to GB/T 3820.

6.1.2 Mass deviation rate per unit area

Perform according to Method 5 of GB/T 4669-2008.

6.1.3 Breaking force

Perform according to GB/T 3923.1.

6.1.4 Tearing strength

Perform according to GB/T 3917.3.

6.1.5 Seam strength

Perform according to GB/T 13773.1. Where, the sewing density is 5 mm/needle, 19# round head needle, 19.7 tex×3 polyester thread (filament).

6.1.6 Elongation at constant load and residual deformation rate

Perform in accordance with the provisions of Appendix A.

6.1.7 Peeling strength

6.1.7.1 Peeling strength (normal)

Perform humidifying and tests on the samples in the standard atmosphere that is specified in GB/T 6529. Before the test, humidify the sample for at least 24 h.

Take two groups of test samples from the to-be-tested fabrics, namely one group of warp-direction test samples, and one group of weft-direction test samples. Each group of test samples contains 3 test samples, which shall avoid wrinkles and defects; the test sample shall be at least 150 mm away from the cloth edge, so as to ensure that the test samples are evenly distributed on the sample. The test sample dimension is 200 mm × 50 mm. Along the length of the sample, manually peel it off at least 40 mm; respectively clamp it on the upper and lower clamps of the CRE tensile test machine; set the distance between the upper and lower clamps to 50 mm; record the curve. Remove the 1/4 part before and after the curve; take the average value of the peak values in the middle 1/2 part as the result. The test result is expressed by the arithmetic

6.1.12 Dimensional stability during heat storage

Humidify the samples according to the standard atmosphere of GB/T 6529 for at least 4 h; take two samples whose size is 300 mm × 300 mm. Make three groups of marking points in the vertical and horizontal directions of each test sample; make the distance between each group of marking points at 200 mm; place the test sample on a 16-mesh metal mesh; place it into an oven; start counting when the temperature reaches 110 °C; take out after 5 minutes; humidify according to the standard atmosphere of GB/T 6529 for at least 4 h; measure the distance of each marking point to the nearest 1 mm. Calculate the dimensional change rate and average value of the sample in the vertical and horizontal directions; round off the data according to the method of GB/T 8170; retain the calculation result to one decimal place. Use the minus sign (-) to indicate decrease (contraction); use the plus sign (+) to indicate increase (elongation).

6.1.13 Combustion performance

Perform in accordance with GB/T 8410.

6.1.14 Formaldehyde content

Perform according to GB/T 2912.2-2009. Sampling is 2 g. For the formaldehyde correction solution, take at least 5 concentrations according to 6.2.2 method in GB/T 2912.2-2009; in addition, add the following 2 concentrations:

0 mLS2 to 500 mL, containing 0 μg formaldehyde/ mL = 0 mg formaldehyde/ kg fabric;

0.5 mLS2 to 500 mL, containing 0.075 μg formaldehyde/ mL = 3.75mg formaldehyde/ kg fabric.

6.1.15 Atomization performance

Perform according to 8.2 gravimetric method in FZ/T 60045-2014.

6.1.16 Odor

Take 3 test samples; place them in a 1 L seal can. The seal can shall be odorless at room temperature and 80 °C; it shall have an easy-open lid. Keep the seal can clean during the test. Dry in an oven at (80 ± 2) °C for 2 h. After drying, cool to (60 ± 5) °C; then, evaluate. When the sample thickness is less than 3 mm, the size is (200 ± 20) cm^2; when the thickness is greater than 3 mm and less than 20 mm, the sample size is (50 ± 5) cm^3; the sample thickness cannot exceed 20 mm; if it exceeds, cut the sample down to a thickness of 20 mm along the use surface of the sample. When smelling, the evaluator shall put the head close to the can (about 15 cm), and remove the lid; then, fan it by

Perform in accordance with GB/T 19977.

6.2 Appearance quality

6.2.1 In general, adopt light inspection; use 3 ~ 4 40W hooded green fluorescent tubes, of which the illumination at the cloth surface is ≥1 075 lx, and the distance between the light source and the cloth surface is 1.0 m ~ 1.2 m. During the inspection, spread the cloth on the cloth inspection table; perform the inspection one by one along the warp-direction. The inspector shall look squarely at the cloth surface; the distance between the eyes and the cloth surface is 55.0 cm ~ 60.0 cm.

6.2.2 Dimension deviation

Perform according to GB/T 4666.

6.2.3 Color difference

Use the color-changing gray card of GB/T 250 to evaluate.

6.2.4 Weft skew and weft bow

Perform according to GB/T 14801.

7 Inspection rules

7.1 Batch regulations

When the same product has the same raw materials and production processes, the products of the same cycle (same dyeing tank) are divided into one batch.

7.2 Sampling

7.2.1 Inherent quality

For products which are supplied in the form of sheet material, the drawn sheet number shall meet all inherent quality indicator performance tests; for products which are supplied in the form of rolls, randomly select one roll, and cut the test sample at least 2 m from the head end; its dimensions shall meet all inherent quality indicator performance test.

7.2.2 Appearance quality

The sampling plan for the inspection of appearance quality is shown in Table 5.

Appendix A

(Normative)

Elongation at constant load and residual deformation rate

A.1 Test equipment

A.1.1 Equipment such as constant-load elongation racks (with fixtures and weights), or electronic strength machines that meet the test requirements can be used.

A.1.2 Steel ruler or tape measure, accurate to 1 mm.

A.2 Test steps

A.2.1 Sample preparation

Take at least three samples along both the warp and weft directions. The width of the knitted fabric sample is (50 + 1) mm; the length is at least 160 mm.

Perform humidifying and tests on the samples according to GB/T 6529. Before the test, humidify the sample for at least 24 h.

A.2.2 Elongation at constant load

Draw two marking lines in the middle of the sample length direction; make the distance between the marking lines at 100 mm (L_0). After clamping under a certain load for 30 minutes, measure the length (L_1) between the two marking lines; calculate the constant load elongation according to Formula (A.1).

$$\text{Elongation at constant load} = \frac{L_1 - L_0}{L_0} \times 100\% \quad \cdots\cdots (A.1)$$

A.2.3 Residual deformation rate

After the test of elongation at constant load, remove the load from the sample. Then, after 30 minutes, measure the length (L_2) between the two marking lines. Calculate the residual deformation rate according to Formula (A.2).

$$\text{Residual deformation rate} = \frac{L_2 - L_0}{L_0} \times 100\% \quad \cdots\cdots (A.2)$$

A.3 Result expression

Take the average of the three groups of data at warp and weft directions, respectively, as the result; round off according to GB/T 8170; retain the result to one decimal place.

Appendix C

(Normative)

Organic matter volatilization test

C.1 Principle

Use a headspace sampler to extract the residual volatile organic compounds in the samples; use the gas chromatograph-hydrogen flame ionization detector (GC/FID) for determination; base on the total carbon.

C.2 Test equipment and chemical reagents

C.2.1 Gas chromatograph: with split-splitless-inlet and flame ionization detector (FID).

C.2.2 Headspace sampler.

C.2.3 Capillary separation column: inner diameter of 0.25 mm; film thickness of 0.25 μm; length of 30 m; 100% polyethylene glycol stationary phase (Wax-type, such as DB-Wax, Carbowax).

C.2.4 Electronic balance: accuracy of 0.1 mg.

C.2.5 Microliter syringe: accuracy of 5 μL.

C.2.6 Chemical reagents:

a) acetone: HPLC grade.

b) n-butanol: HPLC grade.

c) 2,6-butylated hydroxytoluene (BHT): analytical reagent.

C.3 Test steps

C.3.1 Headspace sampler parameters

C.3.1.1 Temperature: heating furnace 120 °C; quantitative tube 150 °C; transfer tube 180 °C.

C.3.1.2 Time: The pressure rises for 19 s; the gas is extruded for 16 s; the injection is continued for 5 s.

C.3.1.3 Pressure: The carrier pressure is 124.80 kPa (18.1 psi or 1.25 bar); the bottle pressure is 159.96 kPa (23.2 psi or 1.60 bar).

C.3.2 Test conditions

C.3.5 Calibration

C.3.5.1 Draw a calibration curve, so as to quantitatively calibrate the total carbon volatility and the amount of various special substances. Use acetone as a calibration substance for total carbon volatilization.

C.3.5.2 After a new separation column is installed, and when the instrument is modified, use 7 concentrations for basic calibration. In addition, at least use 3 concentrations for controlled calibration every month.

C.3.5.3 When performing basic calibration on the acetone, prepare solutions, of which the concentrations are 0.1 g/L, 0.5 g/L, 1 g/L, 5 g/L, 10 g/L, 50 g/L, 100 g/L in n-butanol, as a calibration sample. During the controlled calibration, at least prepare solutions of three concentrations, namely 0.5 g/L, 5 g/L, 50 g/L. Before the calibration, it shall be ensured that no peaks of n-butanol and acetone appear simultaneously.

C.3.5.4 All substances which are used during the calibration shall meet at least the annual quality requirements.

C.3.5.5 During calibration measurement, use a 5 μL syringe to take 2 μL of solution from a 10 mL glass container and inject it into an empty, air-tight headspace sample bottle. It shall be noted that there must be no air bubbles in the syringe.

C.3.5.6 After the calibration sample is subjected to a constant temperature treatment at 120 °C for 1 hour, perform the analysis according to the test specifications. After the solvent is diluted, the temperature chart of the gas chromatograph is interrupted. Perform at least 3 measurements for each calibration solution.

C.3.5.7 Draw a straight line of the peak area of acetone against the concentration of the sample; its slope represents the calibration coefficient K [K (G) represents the total carbon volatilization; K (i) represents the emission of a single substance].

C.4 Result expression

C.4.1 Recording of data

The data that is recorded in the gas chromatograph shall include the total peak area and the peak area of the individual substances that are given in the drawing:

a) Only the peaks need to be considered when calculating the total peak area;

b) The peak height shall be greater than 3 times the baseline noise value;

This is an excerpt of the PDF (Some pages are marked off intentionally)

------ The End ------