The Committee for Conformity Assessment of Accreditation and Certification on Functional and Technical Textiles

Specified Requirements of Generating Heat-Textiles by Moisture Absorption

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Specified Requirements Execution Team	Convener Hsing Wen-Hao	Chairman Lin Neng-Chung

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1. Scope

This requirement specifies the test method for light, heat-retaining, heat-generating by moisture absorbing fabrics which weight less than 200 grams per square meter.

2. Definition

2.1 Generate heat by moisture absorption: the fiber material absorbs the gaseous water molecules from the body surface of the air moisture (humidity), condenses them into liquid water molecules, so that textile temperature rises.

3. Quality

3.1 Eligibility criteria

Average heating value at 30 minutes ($\overline{\Delta T}$) ≥ 0.8 ℃, and highest heating value (ΔT_{max})≥ 2.5 ℃

4.Method

4.1 A sample clip of at least 0.5 m or more is taken from the full width fabric, when sampling avoid 2 m or more from the neadend.

4.2 The clipped samples should be representative, should avoid faults, folds, be at least one-tenth the width of the cloth from the edge, and ensure uniform distribution of clippings on the sample, each clipping should contain different warp (longitutional) yarns and weft (horizontal) yarns.

4.3 Sample preparation: divide into three types: normal, water washed 20 times and water washed 50 times three. Washing method of knitting is performed according to CNS 15140 8B regulations, woven fabric according to CNS 15140 6B regulations, or according to washing method and frequency agreed by both parties.

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4.4 Sampling: of a total combination of the three test clippings are to be prepared, composed of 2 cut pieces (60 ± 1) mm × (100 ± 1) mm each, the 2 test pieces are attached by the inner layer, and stitched together along three sides into a bag-shaped insertion opening, stitches should be parallel with the vertical or horizontal fabric, using lock stitches in polyester, stitches density 8-9 stitch/2 cm, sewing size as shown in Figure 1.

Unit: mm

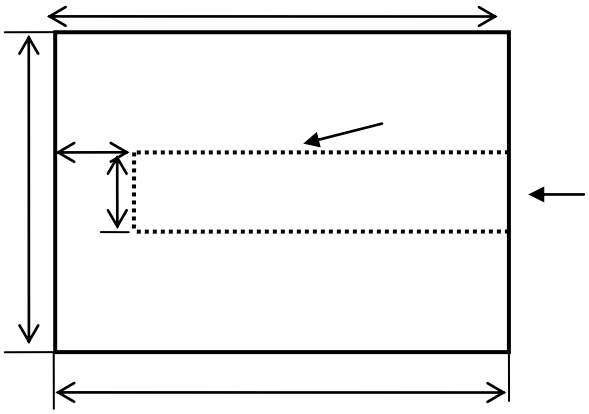

Fig. 1 Illustration of clip sample size

4.5 Equipment:

(1) Programmable constant temperature and humidity control machine: can precisely regulate temperature (20.0 ± 0.5) ℃ and relative humidity from (40 ± 3)% to (90 ± 3)% RH.

(2) 4 identical Sample preparation: divide into three types: normal, water washed 20 times and water washed 50 times three. Washing method of knitting is performed according to CNS 15140 8B regulations, woven fabric according to CNS 15140 6B regulations, or according to washing method and frequency agreed by both parties.

(3) Drying dish.

(4) Oven.

4.6 Procedure steps:

4.6.1 Place the combination of clipped test samples into the weighing bottle, open the lid, place into the oven at (105 ± 2) ℃, and dry until constant weight is reached. Then close the lid, and quickly move the bottle into the drying dish to cool for at least 30 min.

4.6.2 Switch on the constant temperature and humidity machine, until temperature reaches (20.0 ± 0.5) ℃ and humidity reaches (40 ± 3)% RH, wind speed should be maintained at 0.3~0.5 m / s.

4.6.3 Within 20 seconds, remove the three cooled clipped test sample combination from the drying dish, and insert three temperature sensors in three clipped test sample, and place inside together with the remaining clipped test sample without sensor (measurement the temperature inside the constant temperature and humidity machine as baseline value). Sensors should be placed perpendicular to the horizontal plane, avoid overlap between test pieces, and should be at least100 mm from the machine’s inner wall.

4.6.4 The test piece combinations are placed in the machine at (20.0 ± 0.5) ℃, (40 ± 3)% RH, after balance for at least 2 hours, humidity is adjusted to (90 ± 3)% RH, and continue for at least 30 minutes.

4.6.5 Calculate the test pieces' $\overline{\Delta T}$ and ΔT_{max} as humidity goes is adjusted from 40% RH to to 90% RH in 30 minutes.

4.7 Results:

4.7.1 Value of temperature changes in time is calculated according to the formula (1).

$$\Delta T_i = T_{i1} - T_{i2} \quad \text{.....(1)}$$

Wherein

Temperature of sample at time point *i* (℃)

Baseline temperature at time point *i* (℃)

4.7.2 Average temperature increase value of each sample is calculated according to formula (2).

$$\overline{\Delta T} = \frac{\sum_{i=1}^{30} \Delta T_i}{30} \quad \text{.....(2)}$$

Where

Average temperature increase of sample within 30min (℃)

Temperature increase at time point *i* (℃)

4.7.3 Calculate the average of the highest temperature increase of the three sample pieces △T max, up to the first decimal place.

4.7.4 Calculate the average of the 30 minutes average heating value ($\overline{\Delta T}$) of the three sample pieces, up to the first decimal place.

5.Report

The report shall contain the test results and ratings.

6. Reference

6.1	CNS 15140	Household washing and drying procedures for textile testing
6.2	GB/T 29866-2013	Test method for heat absorbing performance textiles

7. Annex:

This standard has been verified by the Specified Requirements Execution Team convenor, and was issued after approval from the chairman of the Assessment Committee, same for all revisions.