

British Standard Methods of test for

Dimensional stability of textile floor coverings

Part 3. Determination of dimensional changes after exposure to heat

Méthodes d'essai relatives à la stabilité dimensionnelle des revêtements de sol textiles
Partie 3. Détermination des variations dimensionnelles après exposition à la chaleur

Prüfung der Maßhaltigkeit von textilen Fußbodenbelägen
Teil 3. Bestimmung von Maßänderungen nach Einwirkung von Hitze

Foreword

This Part of this British Standard has been prepared under the direction of the Fibres, Yarns and Fabrics Standards Committee. The original version of BS 4682 . Part 3 specified a test method for the determination of dimensional changes of textile floor coverings after exposure to heat and immersion in water. This composite method is now considered to be totally unrealistic, and consequently the present revision consists of two entirely separate test methods, Part 3 for exposure to heat and Part 4 for immersion in water. The International Organization for Standardization (ISO) has published ISO 2551-1972 'Machine-made textile floor coverings — Determination of dimensional changes in varying moisture conditions', which is similar in principle to the original British Standard, the two treatments remaining together within a single test method.

The aim of this Part of BS 4682 is to determine the effects on the dimensions of textile floor coverings of prolonged exposure to heat followed by cooling initially in the absence of moisture. It is intended to accelerate the stress-relaxation effects that can occur in primary and secondary backings, especially if these are of a thermoplastics nature.

1. Scope

This Part of this British Standard describes a method for determining the dimensional changes that take place after textile floor coverings have been exposed to heat, and is applicable to textile floor coverings of all types.

2. References

The titles of the standards publications referred to in this standard are listed on the inside back cover.

3. Principle

Comparison is made between measurements of dimensions on a test specimen after conditioning in the standard

atmosphere for testing, then after having been exposed to heat and cooled under desiccated conditions, and then after having been reconditioned in the standard atmosphere for testing

4. Apparatus

The following apparatus is required.

4.1 *Circulating air drying oven* capable of being controlled at $60 \pm 2^\circ\text{C}$.

4.2 *Desiccator* or similar apparatus for maintaining specimens in a dry condition.

4.3 *Rigid perforated tray* of a sufficient size to carry the test specimen.

4.4 *Apparatus* for determining dimensions as required in BS 5920.

5. Atmosphere for conditioning and testing

The atmosphere required for conditioning and testing is the standard atmosphere for testing as defined in BS 1051, i.e. an atmosphere of relative humidity $65 \pm 2\%$ and of temperature $20 \pm 2^\circ\text{C}$.

6. Test specimens

6.1 Sampling. Select the specimens to be as representative as possible of the bulk, where applicable by adopting the standard procedure described in BS 4664.

6.2 Number and dimensions. Take at least three test specimens, each measuring not less than 250 mm x 250 mm, noting the direction of manufacture where possible.

6.3 Preparation. Lay out the specimens flat, singly and with the use surface uppermost in the standard atmosphere for testing for at least 48 h and until they reach constant mass, which is defined as no change in mass of greater than 1 % when determined at hourly intervals over a period of 3 h.

7. Test procedure

Make the first measurements (l_0) on the fully conditioned specimen in accordance with BS 5920.

Place the specimen on the rigid perforated tray with the use-surface uppermost, and put it on a shelf in the drying oven at $60 \pm 2^\circ\text{C}$. Keep the specimen in the drying oven for a period of 24 h. Remove it and place it immediately in a desiccator or similar apparatus to allow cooling to take place. When its temperature has reached $20 \pm 2^\circ\text{C}$, remove the specimen from the desiccator and immediately measure the dimensions (l_1) in accordance with BS 5920.

Leave the specimen in the standard atmosphere for testing, as described in clause 5, to allow reconditioning to take place, until constant mass is again obtained as in 6.3.

Measure the dimensions (l_2) in accordance with BS 5920.

Note the final appearance of the specimen.

8. Calculation and expression of results

Calculate the averages of the measurements obtained for all specimens in the direction of manufacture and for those in the direction at right angles to this for each of the stages referred to in clause 7.

Calculate in each case, to the nearest 0.05 %, the average percentage dimensional change on heating and cooling, and subsequently on reconditioning, as follows:

$$\frac{(L_1 - L_0)}{L_0} \times 100 \text{ and } \frac{(L_2 - L_0)}{L_0} \times 100$$

where

L_0 is the average of the initial measurements (l_0) and L_1 and L_2 are the averages of measurements at the subsequent stages (l_1 and l_2).

Indicate shrinkage by a minus sign and expansion by a plus sign.

9. Test report

The report shall state:

- (a) that the test procedure was conducted in accordance with this British Standard method;
- (b) the individual values, for each specimen, of the measurements made in the direction of manufacture and in the direction at right angles to the direction of manufacture, together with the results obtained as described in clause 8, and the statement that the average percentage dimensional changes are quoted to the nearest 0.05 %;
- (c) a description of the final appearance of the test specimens;
- (d) an indication of the type of measuring instrument used;
- (e) details of any deviations from the standard test procedure.