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Standard Test Method for Dimensional Stability of Sandwich Core Materials[1]

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1. Scope

1.1 This test method covers the determination of the sandwich core dimensional stability in the two plan dimensions.

1.2 The values stated in SI units are to be regarded as the standard. The inch-pound units given may be approximate.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

C271/C271M Test Method for Density of Sandwich Core Materials

C274 Terminology of Structural Sandwich Constructions

3. Terminology

3.1 *Definitions*—Terminology C274 defines terms relating to sandwich constructions.

3.2 *Symbols:*

L_i = initial measured dimension

L_f = final measured dimension

4. Summary of Test Method

4.1 A small piece of honeycomb is placed in an elevated temperature environment and after cooling, the dimensional changes in the plan dimensions are measured and compared to the initial measurements. A typical honeycomb specimen is shown in Fig. 1.

5. Significance and Use

5.1 Sandwich panel cores may change plan dimensions when heated. It is prudent to know if this may be a problem with the final part dimensions.

6. Interferences

6.1 If oven size is limited, smaller specimens may be used.

6.2 If the specimen warps, flatten it out while making the measurements.

7. Apparatus

7.1 *Oven,* capable of maintaining a controlled temperature ±3°C (±5°F).

7.2 *Scale,* capable of measuring accurately to 0.25 mm (0.01 in.).

7.3 *Micrometer,* capable of measuring accurately to 0.025 mm (0.001 in.).

8. Sampling and Test Specimens

8.1 Test at least five specimens per test condition unless valid results can be gained through the use of fewer specimens, such as in the case of a designed experiment.

8.2 The test specimens, if possible, should be approximately 460 by 915 mm (18 by 36 in.) in plan dimension, and the thickness shall be approximately 12.7 mm (0.50 in.). For honeycomb cores, the 460-mm (18-in.) dimension is the core's ribbon or *L* direction. Other dimensions can be used, but must be reported.

9. Calibration

9.1 The accuracy of all measuring equipment shall have certified calibrations that are current at the time of use of the equipment.

10. Conditioning

10.1 When the physical properties of the material are affected by moisture, bring the test specimens to constant weight (±1 %) before testing. A temperature of 23 ± 3°C (73 ± 5°F) and a relative humidity of 50 ± 5 % are recommended.

11. Procedure

11.1 Weigh the specimens in grams (pounds) to a precision of ±0.5 %.

11.2 Determine the plan dimensions of the specimens in millimetres (inches) to a precision of ±0.5 %.

11.3 Measure the thickness of the specimens in millimetres (inches) to the nearest 0.025 mm (0.001 in.).

[1] This test method is under the jurisdiction of ASTM Committee D30 on Composite Materials and is the direct responsibility of Subcommittee D30.09 on Sandwich Construction.

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