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

GB/T 1464-2024

Replacing GB/T 1464-2005

Test method for density of sandwich construction or cores

夹层结构或芯子密度试验方法

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2 Normative references and terms

Two documents are cited: GB/T 1446, General rules for testing the properties of fibre reinforced plastics, and GB/T 3961, Terminology of fibre reinforced plastics. Dated references apply in the cited edition only; undated references apply in their latest edition, including all amendments.

The terms of GB/T 3961 apply, together with one definition. 3.1 geometrical method: method in which the specimen is a regular geometric body and the specimen volume is computed from measured specimen dimensions.

4 Test principle

The specimen volume is computed by the geometrical method and the specimen density is obtained by dividing the specimen mass by that volume.

5 Test apparatus

The apparatus listed is: an oven with an accuracy of 2 °C; a desiccator; a balance with an accuracy of 0.01 g; and a vernier caliper or another measuring instrument with an accuracy of 0.01 mm.

6 Test specimens

The upper and lower faces of the specimen are square or circular and the specimen thickness is the thickness of the sandwich product or of the core. For continuous cores such as foamed plastics and balsa wood, the edge length or diameter should be 60 mm. For cellular cores such as honeycomb and corrugated cores, the edge length or diameter should be 60 mm, or the specimen should contain at least four complete cells. Where the thickness of the sandwich construction or of the core product has not been fixed, a core thickness of 15 mm and a facing thickness of 0.3 mm to 1.0 mm are recommended.

Specimens are machined according to GB/T 1446. Adjacent faces are to be mutually perpendicular; the parallelism tolerance between the upper and the lower face is not greater than 0.10 mm and the perpendicularity tolerance between a side face and the upper and lower faces is not greater than 0.20 mm.

At least five valid specimens are required.

7 Test conditions and conditioning

The standard laboratory environment is a temperature of 23 °C $\pm$ 2 °C and a relative humidity of 50 per cent $\pm$ 10 per cent.

Specimens are conditioned by one of four options: kept for at least 24 h at 23 °C $\pm$ 2 °C and 50 per cent $\pm$ 10 per cent relative humidity; kept for at least 24 h in a desiccator where the standard laboratory environment is not available; conditioned as agreed between the two parties; or, where a dried density is to be measured, conditioned in an oven at 105 °C $\pm$ 2 °C or at 50 °C $\pm$ 2 °C, chosen according to the curing conditions of the specimen, until constant mass within 1 per cent is reached. A note states that specimens treated at high temperature are taken out and cooled to room temperature in a desiccator before weighing.

After conditioning the specimens are cooled at room temperature; cores that readily condense moisture are cooled in a desiccator.

8 Test procedure

The appearance of the specimens is inspected according to GB/T 1446.

The accepted specimens are numbered and the lengths of two adjacent edges, or the diameter, and the thickness are measured; each dimension is measured at a minimum of three evenly distributed positions and the arithmetic mean taken, to the nearest 0.01 mm.

The specimen mass is weighed to the nearest 0.01 g.

9 Test results and their treatment

The density of the sandwich construction or of the core is computed by formula (1), whose symbols are: ρ , the specimen density, in kilograms per cubic metre; m , the specimen mass, in grams; S , the cross-sectional area of the specimen, in square millimetres; and h , the specimen thickness, in millimetres.

The cross-sectional area of a square specimen is computed by formula (2), whose symbols are the cross-sectional area of the square specimen, in square millimetres, and the two edge lengths of the specimen, in millimetres. The cross-sectional area of a cylindrical specimen is computed by formula (3), whose symbols are the cross-sectional area of the cylindrical specimen, in square millimetres, and the specimen diameter, in millimetres.

The results are treated according to GB/T 1446.

10 Test report

The report is to give the name of the test item and the number of this document; the origin and preparation of the specimens and the type and specification of the material; the specimen numbers, shape, dimensions, appearance, mass and quantity; the test temperature, the relative humidity and the conditioning of the specimens; the model, range and condition of use of the test equipment and instruments; the results, that is the value for each specimen together with the arithmetic mean, the standard deviation and the coefficient of variation; and the test personnel, the date and any other particulars.

R Relationship to previous standards

The document replaces GB/T 1464-2005, Test method for density of sandwich construction or cores. Besides structural and editorial changes, the foreword records that the scope was changed; the definition of the geometrical method was changed; the definitions of density, sandwich construction density and core density were deleted; the accuracy of the oven was changed; requirements for specimen preparation were added; the test conditions and the conditioning were changed; the formulas for sandwich construction density and for core density were merged into one; and the content of the test report was changed.

The publication history states that the document was first issued in 1978 and revised in 1987 and in 2005, the present edition being the third revision.