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NATIONAL STANDARD

OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 1452-2005
Replacing GB/T 1452-1987

Test method for flatwise tension strength of sandwich constructions

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Standardization Administration Committee of the People's Republic of China.

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Foreword

This standard modifies and adopts American standard ASTM C297-94(1999) *Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions*. Annex A lists out the comparison of the chapter and article numbers between this standard and ASTM C297-94(1999).

The main technical differences between this standard and ASTM C297-94(1999) are as follows:

— This standard adopts fixture with cardan joint;

— This standard has not only flat tension strength indexes; but has flat tension glue joint line strength indexes for trellis-pattern core.

This standard replaces GB/T 1452-1987 *Standard Test Method for Flatwise Tension Strength of Non-metal Sandwich Constructions*.

This standard, in comparison with GB/T 1452-1987, has the major changes as follows:

— Add Foreword;

— Add Scope (See Chapter 1);

— Add Normative references (See Chapter 2);

— Add some terms and definitions (Chapter 1 of 1987 version, Chapter 3 of this version);

— Add test principle (See Chapter 4);

— Add sample preparation (See Chapter 7);

— Previous test conditions are divided into 2 chapters - test equipment and conditioning (Chapter 3 of 1987 version, Chapter 5 and Chapter 8 of this version).

Annex A of this standard is informative.

This standard was proposed by China Building Materials Industrial Association.

This standard shall be under the jurisdiction of the National Technical Committee on Fiber Reinforced Plastic of Standardization Administration of China.

The responsible drafting organization of this standard: Shanghai FRP Research Institute.

The main drafters of this standard: Zhou Zhulin, Wang Yaxiong, and Zhang Zilong.

This standard was first-time issued in 1978, first revised in 1987, and second revised in 2003.

Test method for flatwise tension strength of sandwich constructions

1 Scope

This standard specifies the test principle, test equipment, samples, conditioning, test procedures, calculation, test result, and test report etc. of test method for flatwise tension strength of sandwich constructions.

This standard is applicable to measurement of flatwise tension strength of the core in sandwich constructions and flatwise tension strength of the core-to-facing bond.

2 Normative references

The articles contained in the following documents have become part of this standard when they are quoted herein. For the dated documents so quoted, all the modifications (excluding corrections) or revisions made thereafter shall not be applicable to this Standard. For the undated documents so quoted, the latest editions shall be applicable to this Standard.

GB/T 1446-2005 Fiber-reinforced plastics composites - The generals

GB/T 3961 Terms for fibre reinforced plastics

3 Terms and definitions

The following terms and definitions and those established in GB/T 3961 apply to this standard.

3.1

Flatwise tension

The tension by using the special fixtures along the direction vertical to panels of sandwich constructions.

3.2

Flatwise tension linear strength

For honeycomb type sandwich construction, it refers to the maximum tensile strength

sustained at the unit jointed side at the direction vertical to panels of sandwich constructions.

3.3

Honeycomb core

The honeycomb type materials made by means of glue jointing, spot welding, or injection molding using of metal foil, glass cloth, plastic and various kinds of paper.

3.4

Adhesive layer

The adhesive layer between panel and core in the sandwich constructions.

3.5

Debonding

The segregation phenomenon of panel and core in the sandwich constructions. This standard also includes the segregation of samples and loading block.

4 Test principle

Apply tensile load at the direction vertical to panel of sandwich structure by using special tensile fixture with cardan joint, so that to make tensile fracture to core or tensile fracture to glue jointing between panel and core.

5 Test equipment and test conditions

5.1 Test equipment shall meet the provisions in Chapter 5 of GB/T 1446-2005.

5.2 See Figure 1 for the diagram of tensile fixtures with cardan joint. Cardan joint can be automatically center-aligning.

5.3 Vernier caliper: accuracy is 0.01mm.

5.4 Load speed is (1-2) mm/min. Arbitration test load speed is 1mm/min.

5.5 Test conditions shall meet the provisions in Chapter 3 of GB/T 1446-2005.

Where:

σ_a — Wiring strength, in N/m;

L_a — Glue jointing length in unit area, 1/mm;

d — Length of double-layer honeycomb side in honeycomb, in mm;

c — Length of single-layer honeycomb side in honeycomb, in mm;

θ — Half of single-layer honeycomb wall angle in honeycomb, in °.

11 Test result

It shall be according to the provisions in Chapter 6 of GB/T 1446-2005.

12 Test report

It shall be according to the provisions in Chapter 7 of GB/T 1446-2005.

Annex A

(Informative)

Comparison of chapters and article numbers between this standard and ASTM C297-94 (1999)

Table A.1 shows the comparison of chapter and article numbers between this standard and ASTM C297-94 (1999).

Table A.1 Comparison of chapters and article numbers between this standard and ASTM C297-94 (1999)

Chapters and article numbers of this standard	Corresponding Chapters and article numbers of foreign standard
1. Scope	1. Scope
2. Normative references	2. References
3. Terms and definitions	—
—	3. Significance and application
4. Test principle	—
5. Test equipment and conditions	4. Equipment
6. Sample	5. Sample
7. Sample preparation	—
8. Conditioning	6. Conditioning
9. Test procedures	7. Procedures
10. Calculation	8. Calculation
11. Test result	—
12. Test report	9. Report
—	10. Accuracy and deviation
—	11. Keywords

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