

ICS 83.120  
CCS Q 23



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

**GB/T 1453-2005**

---

**Test method for flatwise compression properties of sandwich  
constructions or cores  
(English Translation)**

**Issued on: May 18, 2005**

**Implemented on: December 1, 2005**

---

**Issued by: General Administration of Quality Supervision, Inspection and  
Quarantine of the People's Republic of China**

## Table of Contents

|                                               |    |
|-----------------------------------------------|----|
| Foreword...                                   | 3  |
| 1 Scope...                                    | 5  |
| 2 Normative References...                     | 5  |
| 3 Terms and Definitions...                    | 5  |
| 4 Testing Principles...                       | 6  |
| 5 Testing Equipment and Testing Conditions... | 6  |
| 6 Test Sample...                              | 7  |
| 7 Status Conditioning...                      | 9  |
| 8 Test Procedures...                          | 9  |
| 9 Calculation...                              | 10 |
| 10 Test Result...                             | 11 |
| 11 Test Report...                             | 11 |

### Foreword

This standard modifies and adopts American ASTM C365-00 "Test Method for Flatwise Compression Properties of Sandwich Constructions or Cores". The comparison table of Serial Numbers of Chapters and Clauses between this standard and ASTM C365-00 is listed in Annex A.

The main technical differences between this standard and ASTM C365-00 are as follows.

- The test sample in this standard is not only the test sample of the core, but the sandwich construction sample;
- The flatwise compression clamp specified in this standard is more simple, convenient and reasonable;
- The test sample in this standard is provided with uniform size and common principles;
- The terms and definitions are listed in this standard;
- The formula for calculation of compression performance of the cell walls (such as honeycomb walls) (see Annex B) is listed in this standard.

This standard replaces GB/T 1453-1987 "Test Method for Flatwise Compression Properties of Non-metal Sandwich Constructions or Cores".

Compared with GB/T 1453-1987, the main changes of this standard are as follows.

- The preface is added;
- The scope is added (see Chapter 1);
- The normative references are added (see Chapter 2);
- The terms and definitions are added (see Chapter 3);
- The testing principles are added (see Chapter 4);
- The sample preparation is added (see Chapter 7);
- The preparation of the previous testing conditions is divided into two chapters - Test Equipment and Status Conditioning (Chapter 3 of the 1987 version; and Chapter 5 and 7 of this version).

Annexes A and B of this standard are informative.

This standard was proposed by China Building Material Federation.

This standard shall be under the jurisdiction of National Technical Committee 39 on Fibre Reinforced Plastic of Standardization Administration of China.

Responsible drafting organization of this Standard. Shanghai FRP Research Institute.

Participating drafting organization of this Standard. Beijing Institute of Aeronautical Materials.

Main drafters of this standard. Zhou Zhulin, Wang Yaxiong, and Zhang Zilong.

This standard was first-time published in 1978; the first revision was in 1987, and the second revision was in 2003.

Test method for flatwise compression properties of sandwich constructions or cores

## 1 Scope

This standard specifies the testing principles, testing equipment, test samples, status conditioning, test procedures, calculations, test results, test reports, etc. of flatwise compression properties of sandwich constructions or cores.

This standard is applicable to the modulus measurement of flatwise compression strength and flatwise compression elasticity of the sandwich constructions or cores. It is also applicable to the modulus measurement of flatwise compression strength and flatwise compression elasticity of the lattice walls (such as honeycomb walls).

## 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 General Test Methods for Properties of Fibre-reinforced Plastics

GB/T 1464 Density Test Methods for Sandwich Constructions or Cores

GB/T 3961 Terms for Fibre Reinforced Plastics

## 3 Terms and Definitions

For the purpose of this standard, the following terms and definitions AND those defined in GB/T 3961 shall apply.

### 3.1

Flatwise compression

The compression that is perpendicular to the direction of the sandwich construction panel.

### 3.2

Flatwise compressive modulus

## 7 Status Conditioning

The status conditioning of the test sample shall comply with provisions in 4.4 of GB/T 1446-2005.

### 8.1 The appearance inspection of the sample shall comply with provisions in 4.2 of GB/T

1446-2005.

**8.2 The conforming samples shall be numbered. The edge length, diameter or thickness**

of any three positions of the samples shall be measured. The arithmetic mean value shall be taken. The panel thickness shall adopt the nominal thickness or average thickness of the same batch of samples. The measurement precision shall comply with provisions in GB/T 1446-2005.

**8.3 Weigh the sample's mass. The precision shall be 0.01 g. Calculate the sample density according to GB/T 1464.**

**8.4 The test sample shall be mounted between the upper and lower pad blocks according**

to Figure 1. Attention shall be paid to centre-alignment. Adjust the zero point of the testing machine.

**8.5 During the measurement of the flatwise compressive strength, adjust the spherical**

supports; make the upper pad block is parallel to the upper pressure head of the testing machine; then uniformly and continuously apply the load until it is failed; read the failure loading; record the failure form.

**8.6 During the measurement of the flatwise compressive elasticity modulus, adjust the**

spherical supports; apply the initial load (5%-10% of the failure load); adjust the deformer; then additionally apply a certain load (15%~20% of the failure load); inspect the deformer's reading; in case of asymmetry, adjust the spherical supports. After the readings of the both sides of the test sample are the same, reduce the load to the initial load. Then, at level-difference of 5% - 10% of failure load, multi-levelly load to about 50% of failure load, according to the specified loading speed. Record each level's load and corresponding deformation values. If the entire load - deformation data is required, then it shall be tested until failure. If there is automatic logging device, the continuous loading is allowed.