



## Test Method for Determining the Breaking Strength of Components made from Compressed Fibrous Materials

### 1 Introduction

**Note:** Nothing in this standard supercedes applicable laws and regulations.

**Note:** In the event of conflict between the English and domestic language, the English language shall take precedence.

**1.1 Purpose.** This standard shall be used to determine the breaking strength of molded components made from hardboard, wood fiberboard etc. when acted upon by an indenting force.

**1.2 Applicability.** Fiberboard, cardboard, and similar rigid materials.

### 2 References

**Note:** Only the latest approved standards are applicable unless otherwise specified.

#### 2.1 External Standards/Specifications.

None

#### 2.2 GM Standards/Specifications.

GMW3010

GMW3221

### 3 Resources

#### 3.1 Facilities.

**3.1.1 Calibration.** The test facilities and equipment shall be in good working order and shall have a valid calibration label.

**3.1.2 Alternatives.** Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

#### 3.2 Equipment.

**3.2.1** A supporting frame such that the component (or section therefrom) may be adequately supported during testing and the support closely resembles "as assembled in vehicle" conditions. The supporting frame shall be of such a size, that the outer contour of the component (or section therefrom) may be supported for  $(10 \pm 5)$  mm. More specific details of the supporting frame may be shown on the Engineering Drawing or material specification.

**3.2.2** The indenter shall have a  $(32 \pm 0.5)$  mm diameter hemispherical impact head.

**3.2.3** Saws for preparation of test pieces.

**3.2.4** Tensile test machine in accordance with GMW3010 capable of traversing at a speed of  $10 \pm 1$  mm/minute and equipped with a force-extension recorder. It shall be equipped with a compression cage of sufficient size and capacity to accommodate the test piece and test indenter.

**3.3 Test Vehicle/Test Piece.** The complete component shall be used as the test piece whenever possible. Where the size, configuration, etc. prevents this, the largest possible test piece shall be cut from the component, taking care to avoid stressing of the test piece during preparation, and that test piece includes any test area designated by specification. For initial sample approval and arbitration purposes 3 test pieces minimum and for routine quality control 1 test piece minimum shall be tested.

### 3.4 Test Time.

Calendar time: 1 d

Test time: 1 h

Coordination time: 1 h

### 3.5 Test Required Information.

Not applicable.

### 3.6 Personnel/Skills.

Personnel trained in accordance with the laboratory accreditation and Standard Operating Procedure requirements.

## 4 Procedure

**4.1 Preparation.** Tests shall be carried out on test pieces in the as received condition i.e., no special preconditioning.

### 4.2 Conditions.

**4.2.1 Environmental Conditions.** Unless otherwise specified the test shall be performed at  $+23\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ , GMW3221 Code D.

**4.2.2 Test Conditions.** Deviations from the requirements of this standard shall have been agreed upon. Such requirements shall be specified on component drawings, test certificates, reports, etc.

### 4.3 Instructions.

**4.3.1** The complete component, or section therefrom shall be assembled to the supporting frame, and placed in the test equipment ensuring that the indenter is in line with the required area of test.

**4.3.2** The indenter shall be indented into the test piece at a rate of  $(10 \pm 1)$  mm/minute until the test piece fractures or otherwise yields.

## 5 Data

**5.1 Calculations.** Not applicable.

**5.2 Interpretation of Results.** Record the maximum force attained in 4.3.2.

### 5.3 Test Documentation.

**5.3.1** The breaking strength shall be reported as the arithmetic average of the measured individual values, or as the single individual value, in Newtons (N), rounded to the nearest Newton.

## 6 Safety

This Engineering Standard may involve safety requirements for hazardous materials, the method of operations and equipment. This standard does not propose to address all the safety issues associated with its use. It is the responsibility of the user of this standard to ensure compliance with all appropriate safety and health practices. This would include any specific training that may be required. The safety and health standards include site specific rules and procedures, company rules and procedures, and Government Standards. Contact shall be made with the appropriate site Safety and Health personnel for further direction and guidance in these matters.

## 7 Notes

### 7.1 Glossary.

**Breaking Strength:** The breaking strength as determined by this test method shall be defined as the force, acting in compression through a standard indenter, necessary to rupture the component or section therefrom.

### 7.2 Acronyms, Abbreviations, and Symbols.

**GMNA** General Motors North America