

ASTM D7137 TESTING FIXTURE

COMPRESSIVE RESIDUAL STRENGTH PROPERTIES OF DAMAGED POLYMER MATRIX COMPOSITE PLATES



ASTM D7137 Testing Fixture

Knowledge of the damage resistance and damage tolerance properties of a laminated composite plate is useful for product development and material selection. The residual resistance data obtained by this test method will be used in the specification of materials and research and development. The properties obtained using this method will provide a guide about the capacity for tolerance to the expected damage of composite structures similar material, about the thickness and the stacking sequence, and so on.

This testing fixture follows the designation and covers compression residual strength properties of multidirectional polymer matrix composite laminated plates, which have been subjected to quasi-static indentation per Test Method **D6264/D6264M** or drop-weight impact per Test Method **D7136/D7136M** prior to application of compressive force. The composite material forms are limited to continuous-fiber reinforced polymer matrix composites with multidirectional fiber orientations, and which are both symmetric and balanced with respect to the test direction.

The specimen, typically, but not necessarily, a quasi-isotropic laminate, is 6" long, 4" wide, and approximately 0.2" thick. The specimen is simply supported along all four edges, the fixture being adjustable, as indicated by the large number of socket head cap screws, to accommodate small variations in specimen width and thickness.



ASTM D 7137 Testing Fixture - Drawing

Test Standard	ASTM D 7137 - D 7137M / no ISO equivalent
Maximum Load	90 kN
Temperature Range	da -150 °C a 316 °C
Specimen Thickness	4-6 mm
Specimen Width	100 mm
Specimen Length	150 mm
Mass	20.23 kg



ASTM D 7137 Testing Fixture - Assembly



ASTM D7137 Testing Fixture - Application

Referenced Documents

ASTM Standards



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COMPRESSIVE RESIDUAL STRENGTH PROPERTIES OF DAMAGED POLYMER MATRIX COMPOSITE PLATES

- D792 Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement
- D883 Terminology Relating to Plastics
- D3171 Test Methods for Constituent Content of Composite Materials
- D3878 Terminology for Composite Materials
- D5229/D5229M Test Method for Moisture Absorption Properties and Equilibrium Conditioning of Polymer Matrix Composite Materials
- D5687/D5687M Guide for Preparation of Flat Composite Panels with Processing Guidelines for Specimen Preparation
- D6264/D6264M Test Method for Measuring the Damage Resistance of a Fiber-Reinforced Polymer-Matrix Composite to a Concentrated Quasi-Static Indentation Force
- D6641/D6641M Test Method for Compressive Properties of Polymer Matrix Composite Materials Using a Combined Loading Compression (CLC) Test Fixture
- D7136/D7136M Test Method for Measuring the Damage Resistance of a Fiber-Reinforced Polymer Matrix Composite to a Drop-Weight Impact Event
- E4 Practices for Force Verification of Testing Machines
- E6 Terminology Relating to Methods of Mechanical Testing
- E122 Practice for Calculating Sample Size to Estimate, With Specified Precision, the Average for a Characteristic of a Lot or Process
- E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods
- E456 Terminology Relating to Quality and Statistics
- E1309 Guide for Identification of Fiber-Reinforced Polymer-Matrix Composite Materials in Databases
- E1434 Guide for Recording Mechanical Test Data of Fiber-Reinforced Composite Materials in Databases