SÒPHIA
HIGH TECH

AS|EN JISQ 9100

ASTM D4255 A TESTING FIXTURE

IN-PLANE SHEAR PROPERTIES OF POLYMER MATRIX COMPOSITE MATERIALS BY THE RAIL SHEAR METHOD

ASTM D4255-A Testing Fixture

This test method indicates the cutting properties in the plane of a high modulus fiber-reinforced composite materials by two procedures. As regards the procedure A, laminates stuck between two pairs of loading rails are tested. When the tension load is applied to the rails, shear forces arise in the specimen. In procedure B, laminates clamped on opposite edges with a tensile or compressive load applied to a third pair of rails in the center are tested. The application of this method is for continuous-fiber or discontinuous-fiber-reinforced polymer matrix composites in the following material forms:

Laminates wich are composed only of woven fabric filamentary laminae with the warp direction oriented parallel or perpendicular to the mounting rails.

Laminates wich are composed only of unidirectional fibrous laminae, with the fiber direction oriented parallel or perpendicular to the mounting rails.

Laminates of balanced and symmetric construction, with the 0° direction oriented parallel or perpendicular to the mounting rails.

Short-fiber-reinforced composites with a majority of the fibers being randomly distributed

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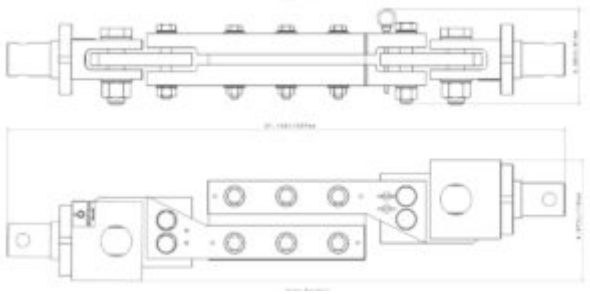
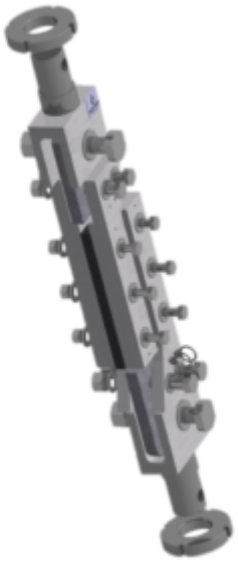


ASTM D 4255-A Testing Fixture – Drawing

Test Standard	ASTM D 4255A / no ISO equivalent
Maximum Load	75 kN
Temperature Range	from -80 °C to 149 °C
Specimen Thickness	1.3-3.2 mm
Specimen Width	74-76 mm
Specimen Length	141-159 mm
Mass	11.30 kg



ASTM D 4255-A Testing Fixture – Assembly

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ASTM D 4255-A Testing Fixture – Application

Referenced Documents

ASTM Standards

D2584 Test Method for Ignition Loss of Cured Reinforced Resins

D3171 Test Methods for Constituent Content of Composite Materials

D3518/D3518M Test Method for In-Plane Shear Response of Polymer Matrix Composite Materials by Tensile Test of a 45 Laminate

D3878 Terminology for Composite Materials

D5229/D5229M Test Method for Moisture Absorption Properties and Equilibrium Conditioning of Polymer Matrix Composite Materials

D5379/D5379M Test Method for Shear Properties of Composite Materials by the V-Notched Beam Method

D5448/D5448M Test Method for Inplane Shear Properties of Hoop Wound Polymer Matrix Composite Cylinders

E4 Practices for Force Verification of Testing Machines

E6 Terminology Relating to Methods of Mechanical Testing

E111 Test Method for Youngs Modulus, Tangent Modulus, and Chord Modulus

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

E251 Test Methods for Performance Characteristics of Metallic Bonded Resistance Strain Gages

E456 Terminology Relating to Quality and Statistics

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E1237 Guide for Installing Bonded Resistance Strain Gages

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

E1471 Guide for Identification of Fibers, Fillers, and Core Materials in Computerized Material Property Databases

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