ASTM D5528 Tensile Fixture

Mode I DCB Fracture Toughness Test Fixture

Built to ASTM D5528 — Standard Test Method for Mode I Interlaminar Fracture Toughness of Unidirectional Fiber-Reinforced Polymer Matrix Composites



OVERVIEW

Opening-mode fixture for double cantilever beam (DCB) testing of composite laminates. Clevises engage the piano hinges or loading blocks bonded to the specimen arms and pull them apart, propagating a delamination from the starter insert to determine Mode I interlaminar fracture toughness.

KEY FEATURES

- Clevises accept piano hinges or loading blocks bonded to the specimen
- Free rotation at load points avoids moments on the arms
- Low-mass design for accurate low-force measurement
- Open access for crack-length viewing and marking
- Optional specimen support for long free ends

TECHNICAL SPECIFICATIONS

Test method	Mode I interlaminar fracture toughness (DCB)
Test type / loading	Tensile opening of specimen arms
Specimens	DCB laminates with insert, hinges or blocks, per ASTM D5528
Load capacity	1 kN standard; higher capacities on request
Fixture material	Hardened steel, corrosion-resistant finish
Load application	Pinned clevises for hinges or loading blocks
Machine connection	Clevis pin or threaded adapter, to suit customer frame
Compatible frames	Electromechanical universal test machines

APPLICATIONS

- Carbon and glass/epoxy laminates
- Thermoplastic matrix composites
- Interlaminar toughness screening
- Aerospace material qualification

ABOUT THE STANDARD

ASTM D5528 determines the opening Mode I interlaminar fracture toughness, GIc, of continuous fiber-reinforced composites using the double cantilever beam specimen. Opening forces are applied through hinges or blocks bonded at the end with a film insert, and load, displacement and crack length are recorded as the delamination grows. Several data reduction methods are defined.

Ordering & customization: Specify hinge or block type and pin diameter, specimen width, required capacity and test machine connection when ordering.

Specifications are typical and may vary by configuration; confirm at time of quote. Users should refer to the current edition of the standard for test procedures. Part ref. UGC-D5528-TF