

## ASTM D2344 Short-Beam Strength of Polymer Matrix Composite Materials and Their Laminates

### TEST METHOD SUMMARY

Three-point bend testing of polymer matrix composite materials per ASTM D2344, is used to determine the short-beam strength of high-modulus fiber-reinforced composite materials. The short-beam strength is of interest for quality control or for comparative testing of composite materials.

The bend test is performed by placing the specimen symmetrical on the support fixture that is mounted either to a servohydraulic or an electromechanical testing machine. The load is applied to the specimen at mid-span until either the load drops off by 30%, the specimen fails to two pieces or the loading nose travel exceeds the specimen nominal thickness. The standard addresses continuous- or discontinuous-fiber-reinforced polymer matrix composite materials.

Solutions for ASTM D2344 typically include these types of components:

### LOAD FRAME OPTIONS\*

The MTS Landmark servohydraulic test systems and MTS Criterion electromechanical universal test systems are ideal for performing accurate and repeatable monotonic testing of polymer matrix composite materials per ASTM D2344.

The MTS Landmark innovative test frame design exhibits superior stiffness and alignment capabilities. The test system integrates the latest MTS servohydraulic technology including precision-machined columns for consistently tight alignment, fatigue-rated MTS actuators with low friction bearings, smooth-ramping hydraulic service manifolds, and SilentFlo™ hydraulic power units are quiet enough to be located directly in the laboratory.

The compact MTS Criterion test system features high-resolution MTS digital controls, linear motion guides for superior alignment, high-speed, low vibration MTS electromechanical drives, optional Dual Zone test space for maximizing efficiency and anti-rotation grip/fixture mounting to minimize fixture misalignment.



MTS Landmark®  
Servohydraulic Test Systems



MTS Criterion®  
Electromechanical Universal Test Systems

### CHAMBER OPTIONS\*

<p><b>MTS Series 651 Environmental Chamber</b></p>	<p><b>MTS Advantage™ Environmental Chamber</b></p>
<ul style="list-style-type: none"> <li>» Temperature range of -150°C to 540°C (-240°F to 1000°F)</li> <li>» Designed for MTS Landmark systems</li> <li>» Compatible with video extensometers</li> </ul>	<ul style="list-style-type: none"> <li>» Temperature range of -129°C to 315°C (-200°F to 600°F)</li> <li>» Designed for MTS Criterion systems</li> <li>» Compatible with video extensometers</li> </ul>

## FIXTURE OPTIONS\*



### Short Beam Shear and Three Point Flexure Fixture

- » Recommended to test in accordance with ASTM D2344
- » Constructed out of high quality stainless steel
- » Force capacities 8.9 kN
- » Loading noses and supports are fixed
- » Fast and accurate specimen positioning with centering device
- » Adjustable spans feature English and metric scales
- » Temperature range of -85°C to 122°C (-120°F to 250°F)

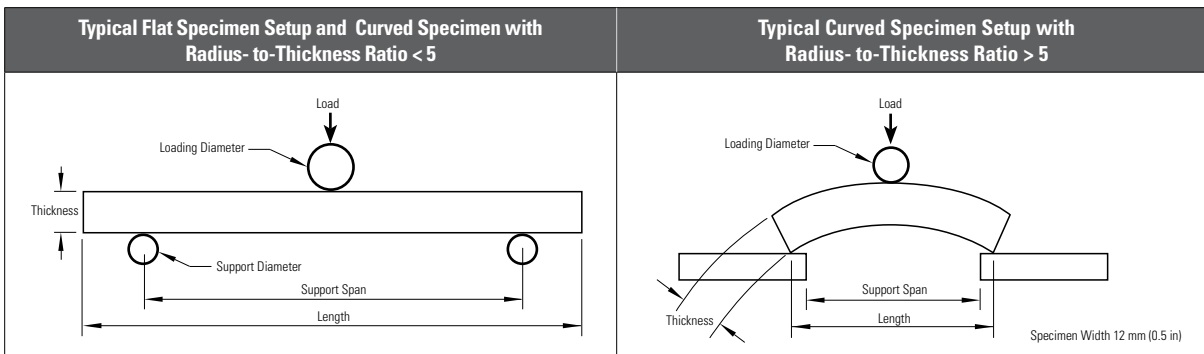
## SOFTWARE OPTIONS\*

ASTM D2344 Short-Beam Strength of Polymer Matrix Composite Materials and Their Laminates	About MTS TestSuite™ TW
<p>To simplify testing to ASTM D2344, MTS has developed a TestSuite™ TW test template that will set-up and run the recommended short-beam test method. Reports can display all of the required calculations including the apparent interlaminar shear strength value.</p> <p>MTS consultants are also available to support your composite applications, test method set-up, and data collection and integration requirements.</p>	<p>The efficient MTS TestSuite TW software provides the versatility required to address unique and complex testing requirements.</p> <p><b>twE</b> TestSuite TW Elite includes all the test definition capacity and flexibility test designers need to create and edit custom test sequences while accommodating the specific runtime needs of lab personnel.</p> <p><b>twX</b> TW Express is designed for the test operator and is used to run tests created with TW Elite. This application allows the operator to easily execute even the most complex tests and monitor data or calculated values in runtime views that can be tailored by both test designers and operators.</p>



\*NOTE: This technical note is intended to show some of the popular and more common solutions used for this particular application. Most often, additional options are available and necessary to accomplish your more comprehensive test objectives.

## APPENDIX - TEST SPECIMEN DETAIL



Specimen Type	Thickness in mm	Width in mm	Length in mm	Radius in mm	Support Span in mm	Support Diameter in mm	Loading Diameter in mm
Flat	2 to 6	Thickness x 2.0 up to 12	Thickness x 6 up to 40	—	Support Span-to-Thickness Ratio (4:1)	3	6
Curved			Thickness x 6 up to 37.26	up to 70		Flat	



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ISO 9001 Certified QMS

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 100-361-323 ASTM D2344 • Printed in U.S.A. • 09/21