EN 2377 Apparent Interlaminar Shear Strength of Glass Fibre Reinforced Plastics

MTS Landmark®
Servohydraulic Test Systems

MTS Criterion®
Electromechanical Universal Test Systems

TEST METHOD SUMMARY

Three-point flexure testing per EN 2377, is used to determine the apparent interlaminar shear strength of textile glass fiber-reinforced plastic composite materials. The short-beam strength is of interest for screening materials or for quality control of composite materials.

The beam flexure 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 interlaminar shear failure occurs.

Solutions for EN 2377 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 glass fiber-reinforced plastic composite materials per EN 2377.

The MTS Landmark system's 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.

CHAMBER OPTIONS*

	
MTS Series 651 Environmental Chambers	**MTS Advantage™ Environmental Chamber**
» Temperature range of -150°C to 540°C (-240°F to 1000°F) » Designed for MTS Landmark systems » Compatible with video extensometers	» Temperature range of -129°C to 315°C (-200°F to 600°F) » Designed for MTS Criterion systems » Compatible with video extensometers

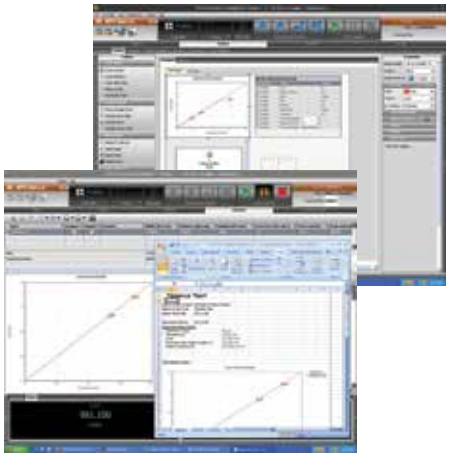
FIXTURE OPTIONS*

MTS 3-Point Bend Fixtures

» Recommended to test in accordance with EN 2377
» Value-priced fixtures for a wide range of flexural tests provides a line of maximum stress
» Available in a range sizes with force capacities of 10 kN, 20 kN and 30 kN
» Loading noses and supports are fixed
» Fast and accurate specimen positioning with centering device
» Precision machined rollers are made from corrosion resistant hardened steel for long service life
» Adjustable lower spans feature metric scales
» Temperature range of -70° C to 350° C (-94° F to 662° F)

SOFTWARE OPTIONS*

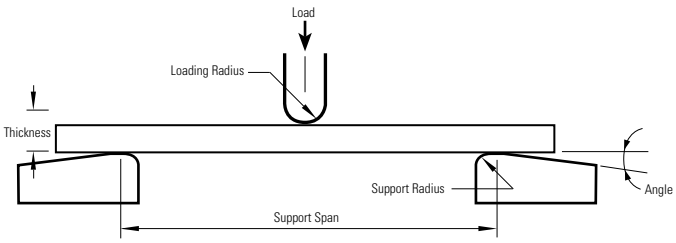
EN 2377 Apparent Interlaminar Shear Strength of Glass Fibre Reinforced Plastics	About MTS TestSuite™ TW
MTS has developed generic composite apparent interlaminar shear strength TestSuite TW test templates that can easily be modified to be in compliance with the EN 2377 requirements. Reports can display all of the required calculations including the apparent interlaminar shear strength value. MTS consultants are also available to support your composite applications, test method set-up, and data collection and integration requirements.	The efficient MTS TestSuite TW software provides the versatility required to address unique and complex testing requirements. twe 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. twx 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.



*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

Typical Specimen Setup



Thickness in mm	Width in mm	Support Span in mm	Loading Radius in mm	Support Radius in mm	Angle in°
3	10	Support Span-to-Thickness Ratio (5:1) 15	3 to 5	2 to 3	5

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