



MTS Landmark®
Servohydraulic Test Systems



MTS Criterion®
Electromechanical Universal Test Systems

EN 2561 Tensile Properties Parallel to the Fibre Direction of Unidirectional Carbon Fibre-Reinforced Plastics

TEST METHOD SUMMARY

Tensile testing of unidirectional carbon fibre reinforced composites parallel to the fibre direction per EN 2561, is used to determine mechanical material property data. Uniaxial tensile force is applied to a flat test specimen to investigate the stress/strain behavior and critical materials properties including tensile modulus, tensile strength, elongation at break, and Poisson's ratio. This standard only addresses unidirectional carbon fibre-reinforced composite materials with the axis parallel to the fibre direction.

The tensile test is performed by placing a test specimen in the grips of either a servohydraulic or an electromechanical testing machine and subjecting it to controlled tension load until failure. The specimen response can be measured with a contacting or non-contacting extensometer, or strain gages.

Solutions for EN 2561 typically include these types of components:


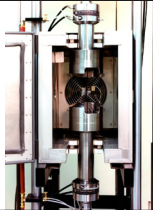
LOAD FRAME OPTIONS*

The MTS Landmark servohydraulic test systems and MTS Criterion electromechanical universal test systems are ideal for performing accurate and repeatable monotonic testing of carbon fibre-reinforced plastics per EN 2561.

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 that 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 shear stresses on the specimen.

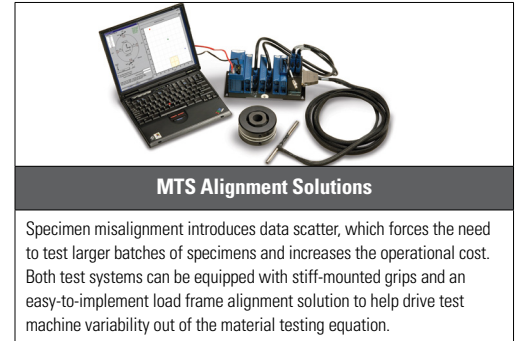
GRIP OPTIONS*

	
Model 647 Side-Loading Hydraulic Wedge Grips	Model 647 All-Temperature Side-Loading Hydraulic Grips
<ul style="list-style-type: none"> » Temperature range of -40°C to 175°C (-40°F to 350°F) » Stiff mounting ensures superior alignment capabilities and repeatable gripping to minimize bending strains » Tension, Compression & Fatigue capability » Adjustable gripping force to prevent slippage and squashing of the test specimen 	<ul style="list-style-type: none"> » Temperature range of -130°C to 315°C or 540°C (200°F to 600°F or 1000°F) » Thermal gradients as low as 1.6°C (3°F) ensure reduced variability » Remotely operated grips support rapid specimen change without cooling for increased productivity

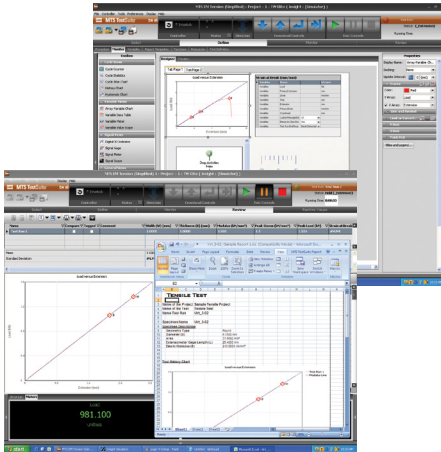
GRIP FACE OPTIONS*



ALIGNMENT OPTIONS*



SOFTWARE OPTIONS*



EN 2561 Tensile Properties of Unidirectional Fibre Reinforced Plastic Composites Test Template	About MTS TestSuite™ TW
<p>MTS has developed general composite tensile TestSuite TW test templates that can easily be modified to be in compliance with the EN 2561 requirements. The templates support the use of strain gages or extensometers for strain measurement. Reports can display all of the required calculations including stress-strain plot, modulus of elasticity, stress at yield, strain at yield, tensile strength, strain at strength, stress at break, and strain at break, Poisson's ratio, and more.</p> <p>MTS consultants are also available to support any of 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>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.</p> <p>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.</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 A	Specimen Type B	Specimen Type C
<p>Overall length 250 mm</p> <p>Width 15 mm</p> <p>Thickness 2 mm</p> <p>Length of end tabs $65 \pm 15 \text{ mm}^{**}$</p> <p>Initial distance between grips 136 mm</p> <p><small>** Thickness of end tabs 0.5 to 1 mm</small></p>	<p>Overall length 250 mm</p> <p>Width 15 mm</p> <p>Thickness 1 mm</p> <p>Length of end tabs $65 \pm 15 \text{ mm}^{**}$</p> <p>Initial distance between grips 136 mm</p> <p><small>** Thickness of end tabs 0.5 to 1 mm</small></p>	<p>Overall length 250 mm</p> <p>Width 15 mm</p> <p>Thickness 1 mm</p> <p>Initial distance between grips 130 mm</p>



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ISO 9001 Certified QMS

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