Recommended Test Guidelines for QISO - 0°, +/-60° Fabric

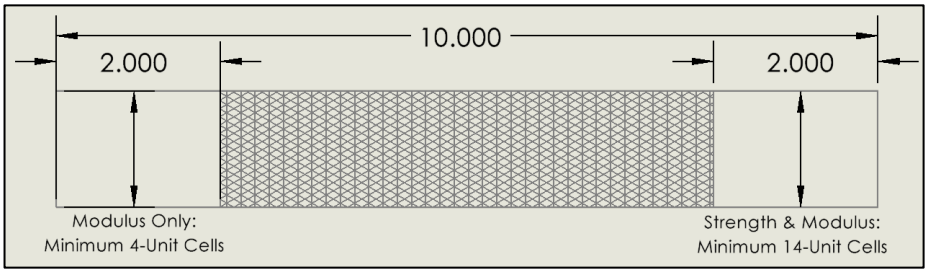
The standard ASTM methods below are recommended for testing QISO, with a modified version of ASTM D3039 required for 90° tension and a specified coupon width for 0° and 90° tensile testing.

Mechanical Property	Test Method
0° Tension	ASTM D3039
90° Tension	**ASTM D3039**
In-plane Shear	ASTM D7078
0° Compression	ASTM D6641
90° Compression	**ASTM D6641**
0° Open Hole Tensile Strength	ASTM D5766
0° Open Hole Compressive Strength	ASTM D6484
Acid Digestion	ASTM D3171

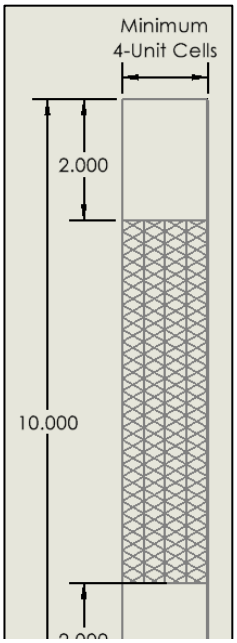
ASTM D3039 Longitudinal (0°) and Transverse (90°) Tensile Strength & Modulus – Coupon Width Requirement

The straight-sided coupon used to test 0° tensile properties requires a minimum width of 4-unit cells, per ASTM D6856.

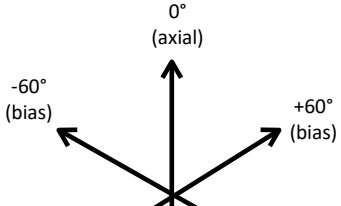
The width of a straight sided coupon used to test 90° tensile properties varies based on what property is being tested. For modulus measurement only, straight sided coupons with a minimum of 4-unit cells is required. If testing for strength and modulus using the standard straight sided coupon, a minimum width of 14-unit cells is required. This is due to premature failures initiated at the coupon edges when using the standard straight-sided coupon.



QISO 90-degree Tension Coupon

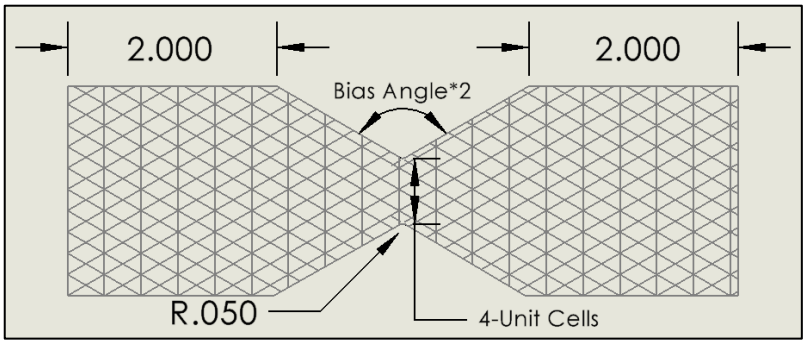


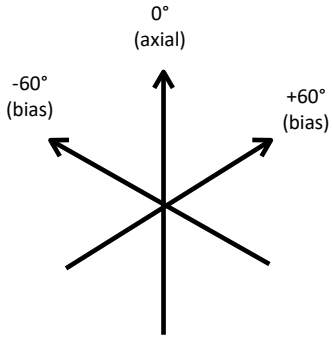
QISO 0-degree Tension Coupon



ASTM D3039 *Modified* Transverse (90°) Tensile Strength – Coupon Geometry Modification

For QISO, an industry accepted modification to ASTM D3039 uses a **bowtie** coupon geometry, instead of a straight-sided coupon, when 14-unit cells is too wide, allowing continuous fiber to travel from grip to grip for accurate load transfer. This modified coupon geometry yields accurate transverse strengths representative of braid performance in actual composite structures. The bowtie coupon geometry has been tested extensively by NASA. Due to complex strain fields, modulus cannot be accurately measured with a bowtie coupon – the bowtie should be used only when testing strength.





ASTM D6641 Transverse (90°) Compressive Strength & Modulus – Coupon Width Requirement

Similarly to 90° tensile testing, 90° compressive strength per ASTM D6641 also benefits from a wider specimen. Coupons should be as wide as the fixture allows.

A&P Technology is happy to support testing of its materials through the fabrication of panels, cutting of coupons, or testing at independent testing labs.

Please contact Brandon Strohminger, Application Engineer at A&P Technology, to discuss any testing questions: bstrohminger@braider.com or 513-688-3299

For more information on QISO: QISO Triaxial Fabric - Superior Performance - A&P Technology

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