



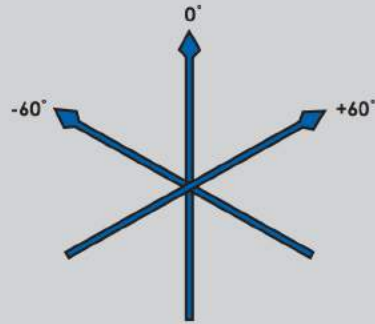
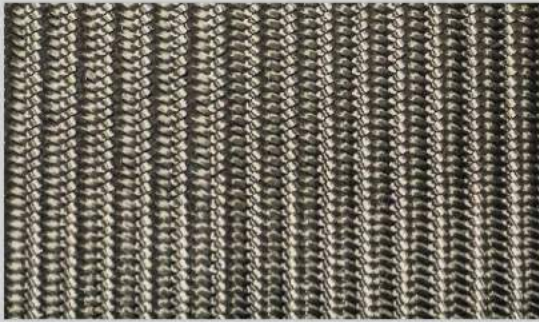
QISO[®]

Quasi-Isotropic Fabric



BETTER PARTS LOWER COST

QISO's 0°, +/-60° Fiber Architecture



Pound for pound, QISO is equivalent in costs to standard fabrics and provides additional cost savings due to:

Simple & Efficient Processing

No need to orient plies. QISO® has equal amounts of material in every direction, providing uniform stiffness in all directions and enabling easy lay-up.

Reduction in Waste

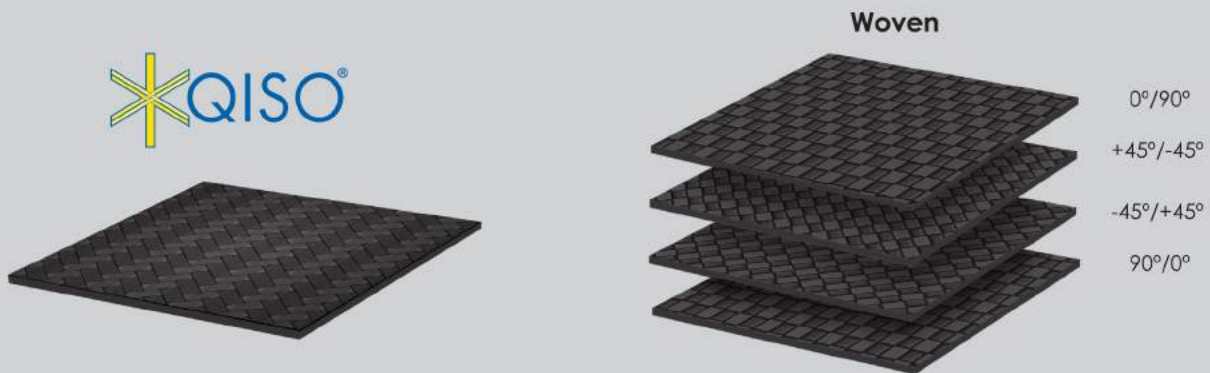
QISO's uniformity in all directions enables efficient use of the fabric. Pattern cutting is simplified and material usage is optimized.

Superior Performance

Benchmarked against a comparable woven laminate, QISO® outperforms woven fabrics in tension, compression and open hole. In an impact event, interlaminar shear stresses are reduced due to QISO's uniform ply architecture, resulting in better energy absorption and higher impact resistance.

Balance in a Single Layer

Each ply of QISO represents a balanced 0°/+45°/-45°/90° layup



To achieve a balanced laminate with conventional 0/90 fabrics, four layers or a multiple of four layers is required. QISO® is balanced within a single ply, so the fabricator has the design flexibility to use the exact number of plies necessary to meet strength and stiffness requirements. QISO allows the efficient use of material to minimize part thickness and reduce material and labor costs.

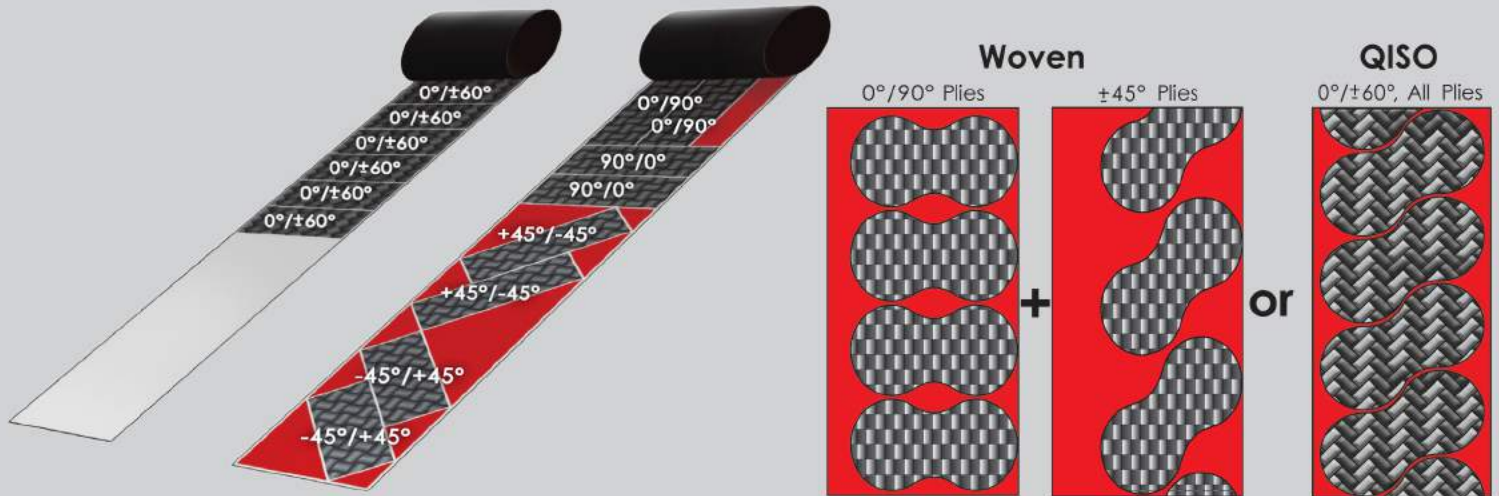


Less Waste

QISO® has the same properties in every direction, so there is no need to orient plies. QISO® also allows for simple and efficient nesting of patterns. With woven fabrics, cutting based on fiber orientation results in excess waste.

QISO-H-48
Fabric Length Used: 10.0 ft
Wasted Area: 0.0 sq. ft.
Percent Waste: 0.0%

Woven 48" Wide
Fabric Length Used: 20.1 ft
Wasted Area: 27.1 sq. ft.
Percent Waste: 33.8%



Better Performance

Testing was performed comparing QISO-H laminates to Plain Weave laminates of the same thickness. The QISO-H laminate was comprised of 6 aligned plies of 536 gsm fabric. The plain weave laminate was comprised of 8 plies of 400 gsm fabric with a quasi-isotropic lay up $([0^\circ/+45^\circ]_{2s})$. The fiber for both laminates is Toray T700S 12k, and the resin is Tencate TC275-1. All results have been normalized to 55% Vf.

Mechanical Properties	Test Method	QISO-H Laminate	Quasi-isotropic PW Laminate	QISO vs PW
0° Tensile Strength (ksi)	ASTM D3039	134.9	92.5	46%
90° Tensile Strength (ksi)	ASTM D3039 (mod.)*	127.7	100.0	28%
0° Compressive Strength (ksi)	ASTM D6641	82.5	55.2	50%
90° Compressive Strength (ksi)	ASTM D6641	61.4	52.6	17%
0° Open Hole Tensile Strength (ksi)	ASTM D5766	98.0	70.2	40%
0° Open Hole Compressive Strength (ksi)	ASTM D6484	61.4	43.0	43%

*90° tensile strength measured by industry accepted "notched" coupon modification to the standard ASTM D3039 test method. Please see braider.com for additional details.





All A&P products can be tailored to specific widths and weights. Please contact a sales representative (sales@braider.com 513-688-3200) to discuss optimizing a braid design to meet your requirements.

LIGHT	Product Code	Width		Angle	Yield		Fabric	Weight	Thk @ 55% FV	
		in	mm		yd/lb	m/kg			oz/sqyd	g/sqm
	QISO-L-20	20.1"	511	0, +/- 60	3.6	7.2	8.0	272	0.011	0.28
	QISO-L-52	52"	1321	0, +/- 60	1.4	2.8	8.0	272	0.011	0.28
	QISO-L-A-52	52"	1321	0, +/- 60	1.4	2.8	8.0	272	0.011	0.28

MEDIUM	Product Code	Width		Angle	Yield		Fabric	Weight	Thk @ 55% FV	
		in	mm		yd/lb	m/kg			oz/sqyd	g/sqm
	QISO-M-48	48"	1249	0, +/- 60	1.0	2.0	11.6	393	0.016	0.41

MEDIUM - INTERMEDIATE MODULUS	Product Code	Width		Angle	Yield		Fabric	Weight	Thk @ 55% FV	
		in	mm		yd/lb	m/kg			oz/sqyd	g/sqm
	QISO-MIM-48	48"	1219	0, +/- 60	0.9	1.9	12.9	439	0.018	0.45
	QISO-MIM-52	52"	1321	0, +/- 60	1.2	2.5	9	305	0.012	0.31

HEAVY	Product Code	Width		Angle	Yield		Fabric	Weight	Thk @ 55% FV	
		in	mm		yd/lb	m/kg			oz/sqyd	g/sqm
	QISO-H-48	47.9"	1217	0, +/- 60	0.8	1.6	15.8	536	0.021	0.54
	QISO-H-59	59.2"	1504	0, +/- 60	0.6	1.3	15.8	536	0.021	0.54

HEAVYWEIGHT	Product Code	Width		Angle	Yield		Fabric	Weight	Thk @ 55% FV	
		in	mm		yd/lb	m/kg			oz/sqyd	g/sqm
	QISO-HW-48	48"	1219	0, +/- 60	0.6	1.2	19.5	661	0.026	0.66

HEAVY HEAVY	Product Code	Width		Angle	Yield		Fabric	Weight	Thk @ 55% FV	
		in	mm		yd/lb	m/kg			oz/sqyd	g/sqm
	QISO-HH-48	48"	1219	0, +/- 60	0.4	0.7	32.6	1105	0.044	1.13