

Resin System

Resin Base	Description	Application
Isophthalic Polyester Resin	Industrial grade corrosion resistance, operating temperature -50°C ~ 105°C	Provides an intermediate level of chemical resistance and is the correct resin choice for grating subjected to splash and spill contact with harsh chemicals, and is a very good general purpose resin at a reduced cost compared to the premium vinyl ester resin.
Isophthalic Fire Retardant Polyester Resin (ISO-FR)	Industrial grade corrosion resistance and fire retardant, flame spread rating ASTM E84 Class 1, 25 or less, or BS 476 Part 7 Class 1, operating temperature -50°C ~ 105°C	Such resin can be used in the environments of middle concentration of inorganic acid and alkali which required better flame resistance.
Vinyl Ester Resin (VE)	Superior corrosion resistance, operating temperature -50°C ~ 110°C	Such resin provides the most chemical resistance in the industry, designed to withstand the harshest chemical environments over a broad range of acids and caustics, it is primarily used in petrochemical, waste water, and plating
Vinyl Ester Resin (VE-FR)	Superior corrosion resistance and fire retardant, flame spread rating ASTM E84 Class 1, 25 or less or BS 476 Part	This resin exhibits excellent corrosion resistance and is capable of higher service temperatures and has low smoke generation.
Phenolic Resin	Low smoke and superior fire resistance, flame spread rating ASTM E84 Class 1, 5 or less, smoke developed 0, operating temperature up to 180°C	Such resin can be used in the areas where fire resistance, low smoke and low toxic fumes are critical.

Ultimate Coupon Properties

Property	ASTM	Units	Polyester	Vinyl Ester
MECHANICAL (50% Mat & Roving)				
Tensile Strength, LW	D638	Mpa	207.0	207.0
Tensile Strength, CW	D638	Mpa	48.3	48.3
Tensile Modulus, LW	D638	Gpa	17.2	17.9
Tensile Modulus, CW	D638	Gpa	5.5	5.5
Compressive Strength, LW	D695	Mpa	207.0	207.0
Compressive Strength, CW	D695	Mpa	103.0	110.0
Compressive Modulus, LW	D695	Gpa	17.2	17.9
Compressive Modulus, CW	D695	Gpa	5.5	5.5
Flexural Strength, LW	D790	Mpa	207.0	207.0
Flexural Strength, CW	D790	Mpa	68.9	68.9
Flexural Modulus, LW	D790	Gpa	11.0	11.0
Flexural Modulus, CW	D790	Gpa	5.5	5.5
Modulus of Elasticity, E	Full Section	Gpa	17.9	19.3
Shear Modulus	-	Gpa	2.9	2.9
Interlaminar Shear	D2344	Mpa	31.0	31.0
Notched Izod Impact , LW	D256	J/mm	1.3	1.3
Notched Izod Impact , CW	D256	J/mm	0.2	0.2
Maximum Bearing Strength, LW	D953	Mpa	207.0	207.0
Poisson's Ratio, LW	D3039	mm/mm	0.3	0.3
MECHANICAL (70% Roving Only)				
Tensile Strength, LW	D638	Mpa	689.7	207.0
Tensile Modulus, LW	D638	Gpa	41.2	17.9
Compressive Strength, LW	D695	Mpa	413.8	207.0
Flexural Strength, LW	D790	Mpa	689.7	207.0
Flexural Modulus, LW	D790	Gpa	41.2	11.0
Notched Izod Impact , LW	D256	J/mm	2.1	1.3
PHYSICAL				
Barcol Hardness	D2583		45.0	45.0
24 Hr Water Absorption	D570	% Max	0.6	0.6
Density	D792	10-3g/mm ³	1.72-1.94	1.72-1.94
Coefficient of Thermal Expansion	D696	10-5mm/mm/°C	1.2	1.2
		10-6mm/mm/°F	7.0	7.0
Thermal Conductivity	C177	W.m/m-2/°C	83.1	83.1
ELECTRICAL				
Arc Resistance, LW	D495	seconds	120.0	120.0
Dielectric Strength, LW	D149	kV/mm	1.38	1.39
Dielectric Strength, PF	D149	kV/mm	7.9	7.9
Dielectric Constant, PF	D150	60Hz	5.2	5.2
FLAMMABILITY				
Flammability Classification	UL 94		VO	
Tunnel Test	ASTM E84		25 Max	
Flammability Extinguishing	ASTM D635		Self Extinguishing	
NBS Smoke Chamber	ASTM E662		650-700	
British Fire Test	BS 476- Part 7		Class 1	

LW = Lengthwise CW = Crosswise PF = Perpendicular to Laminate Surface