



CYCOM[®] 4102 Structural Resin

DESCRIPTION

CYCOM[®]4102 is a polyester structural resin that is a flame-resistant version of CYCOM[®]4101. CYCOM[®]4102 is available on a variety of reinforcing fibers. When combined with fiber glass reinforcements, it is capable of meeting the requirements of Flight Standards Service Regulation No. 453 and MIL-R-7575C Grade B, Class 0. CYCOM[®]4102 prepregs are used to manufacture heating, defrosting, de-icing, and ventilating ducts, and in general purpose laminated parts.

CHARACTERISTICS

Table 1 | Typical Prepreg Properties

Fiber	"E" Glass
Reinforcement Style	7781
Resin Content, %	40 ± 5
Flow, % at 275°F (135°C) 15 PSI (.11 MPa)	5 – 20
Volatile Content, maximum %	4
Gel time, seconds at 275°F (135°C)	3- 90
Shop Life at room temperature	14 – 21 Days
Shelf Life	Six (6) months at 0°F (-18°C) or four (4) months at 40°F (5°C)

Table 2 | Mechanical Performance

Product Description	"E" Glass
Reinforcement Style	7781
Orientation	0° / 90°
Number of plies	12
Cure pressure, PSI (MPa)	Vacuum 13 PSI (0.09)
Cure temperature	250°F (121°C)
Heat-up rate,	3.5°F/minute (1.9°C/minute)

Table 3 | Physical Properties

Property	
Cured ply thickness, inches (mm)	0.0090 (0.230)
Resin content, %	31 – 39
Laminate specific gravity, g/cc	1.70 – 2.00
Barcol hardness	60 – 65
Flammability	
60 second vertical burn	
Extinguishing time, seconds	2
Burn length, inches (mm)	1.5 (38)
Resin drop extinguishing time, seconds	Zero
30 second 45° angle burn	
Extinguishing time, seconds	Zero
Penetration	Less than complete
Afterglow, seconds	Zero

PROPERTIES

Table 4 | Advanced Composite Prepreg

Property	
Tensile Strength, KSI (MPa)	
75°F (24°C)	80 (551)
Tensile Modulus, MSI (GPa)	
75°F (24°C)	3.8 (26)
Flexural Strength, KSI (MPa)	
75°F (24°C)	80 (551)
75°F (24°C), Wet*	65 (448)
250°F (121°C)	45 (310)
Flexural Modulus, MSI (GPa)	
75°F (24°C)	3.6 (25)
Compressive Strength, KSI (MPa)	
75°F (24°C)	70 (482)
75°F (24°C), Wet	50 (345)
300°F (150°C)	35 (241)
Short Beam Shear Strength, KSI, MPa)	
75°F (24°C)	3.5 (24)

* WET = 2 HOUR WATER BOIL

LAMINATING AND CURING TECHNIQUES

Typical Lay-up

Typical procedures for preparing vacuum bag - oven cured laminates involve cutting patterns to size and laying-up the laminate in the desired configuration, taking care not to distort the prepreg. As each ply of material is positioned, work out any wrinkles or entrapped air with a paddle or roller with a release coating before removing the release the release paper or polyethylene film from that ply.

Place the layup on a tool or caul sheet which has been treated with a release agent. Insert a thermocouple into the lay-up near the center ply of the thickest edge section, outside the neat trim line.

Normally, no edge resin bleeder is used. In those cases where a vertical resin bleeder is required, permeable fluorocarbon coated fabric may be used. The amount of resin to be bled away is controlled by the number and type of dry plies of glass bleeder cloth placed over the permeable release film. Cover the entire lay-up with a release film and then install a vacuum bag by standard techniques. Insert at least two vacuum stems through the bag, connecting one to a vacuum source and the other, at a point furthest away from the source, to a calibrated vacuum gauge. Position part in oven or autoclave and draw vacuum to check for system leaks.

Cure Cycle

To cure, draw a vacuum of at least 27 inches (675 mm) of mercury (note: additional pressure is optional). The recommended heat-up rate is 3°F to 5°F (1.9°C to 3.0°C) per minute to 250°F (121°C). Hold for two hours at 250°F (121°C). Times and temperatures are based upon the lagging thermocouple. Upon completion of cure cycle, cool under vacuum until part temperature has fallen below 150°F (66°C).

PRODUCT HANDLING AND SAFETY

Cytec Industries Inc. recommends wearing clean, impervious gloves when working with prepregs materials to reduce skin contact and to avoid contamination of the product. Materials Safety Data Sheets (MSDS) and product labels are available upon request and can be obtained from www.cytec.com or any Cytec location supplying aerospace materials.

DISPOSAL OF SCRAP MATERIAL

Disposal of scrap material must be in accordance with local, state, and federal regulations.

CONTACT INFORMATION

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