

CYCOM[®] 970 Epoxy Resin

DESCRIPTION

CYCOM[®] 970 epoxy resin is a controlled flow, 350°F (177°C) curing epoxy resin with good 300°F (149°C) dry service capability. CYCOM 970 is excellent for producing nonporous, void-free honeycomb sandwich structures, as well as laminates.

CYCOM 970 has adjustable tack and is available as unidirectional tape, fabric or roving. The prepreg is formulated for autoclave processing. Recommended cure is two hours at 350°F (177°C). No post-cure is required for dry service capability. The recommended lay-up procedure is L-9 for honeycomb core or L-8 for laminates (refer to Figure 2 and Figure 3). Recommended cure procedure is C-8 (refer to Figure 4). CYCOM 970 can be impregnated via solution technique on all available fibers and fabrics.

Typical applications for CYCOM 970 include structural aircraft components requiring honeycomb sandwich panels.

FEATURES & BENEFITS

- 350°F (177°C) cure
- Available in a broad range of fibers and forms including tape, fabric and roving
- Controlled flow resin for use in making honeycomb parts
- 300°F (149°C) dry and 200°F (93°C) wet service temperature
- Sandwich panel and laminate usage
- Autoclave processing
- Shelf life 6 months at 0°F (-18°C), 10 days at 72°F (22°C)

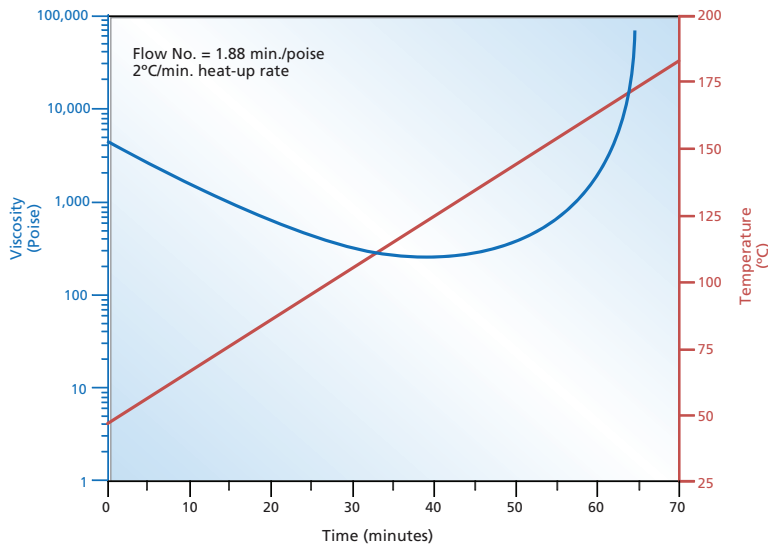
SUGGESTED APPLICATIONS

Structural aircraft components requiring honeycomb sandwich panels.

CHARACTERISTICS

Viscosity Profile

Figure 1 | CYCOM 970 Viscosity Profile: Straight Heat-up Cure Cycle to 250°F (121°C)



PROPERTIES

Table 1 | Mechanical Properties: Standard Modulus (33Msi/228 GPa Class) Carbon Fiber Reinforced Unidirectional Tape
Typical Cytec Engineered Materials Product Code Hy-E 3070K/Grad 145

Property	75°F (24°C)	200°F (93°C)	200°F (93°C) Wet
0° Tensile Properties			
Strength, ksi	231 – 255	217 – 249	-
Strength, MPa	1592 – 1758	1496 – 1716	-
Modulus, Msi	17.4 – 17.8	17.2 – 17.4	-
Modulus, GPa	120 – 121	119 – 120	-
0° Compressive Properties			
Strength, ksi	192 – 212	162 – 186	131 – 149
Strength, MPa	1323 – 1461	1117 – 1282	903 – 1027
Long Beam Flex			
Load, lb	280 – 328	260 – 312	214 – 242*
Load, N	1246 - 1459	1157 - 1388	952 – 1076*
P/Y, lb/in	259 – 263	247 – 257	247 – 259*
P/Y, N/cm	454 - 461	433 - 450	433 – 454*
Flatwise Tensile Strength			
psi	697 – 753	634 – 682	-
MPa	4.81 – 5.19	4.37 - 4.70	-
Interlaminar Toughness, G_{1c}			
In-lb/in ²	1.0 – 1.4	-	-
kJ/m ²	0.175 – 0.245	-	-

Property values listed are typical for laminates with 62% fiber volume.

Wet = 14 day water immersion at 160°F (71°C)

* Wet = 24 hour immersion at 160°F (71°C) and 95% relative humidity

Table 2 | Mechanical Properties: Standard Modulus (33Msi/228 GPa Class) Carbon Fiber Reinforced Plain Weave
 Typical Cytec Engineered Materials Product Code HMF 5-322/70C

Property	75°F (24°C)	200°F (93°C)	200°F (93°C) Wet
0° Tensile Properties			
Strength, ksi	102 – 114	85 – 98	-
Strength, MPa	703 – 786	586 – 675	-
Modulus, Msi	8.7 – 9.0	8.4 – 8.7	-
Modulus, GPa	59.9 – 62.0	57.9 – 59.9	-
0° Compressive Properties			
Strength, ksi	109 – 119	90 – 98	66 – 74
Strength, MPa	751 – 820	620 – 675	455 – 510
Modulus, Msi	8.0 – 8.4	8.0 – 8.4	-
Modulus, GPa	55.1 – 57.9	55.1 – 57.9	-
Long Beam Flex			
Load, lb	287 – 313	243 – 267	206 – 234
Load, N	1277 - 1392	1081 - 1188	913 - 1041
P/Y, lb/in	243 – 259	245 – 253	242 – 250
P/Y, N/cm	426 - 454	429 - 443	424 - 438
Flatwise Tensile Strength			
psi	724 – 792	647 – 711	-
MPa	4.99 – 5.46	4.46 – 4.90	-
Interlaminar Toughness, G_{1c}			
In-lb/in ²	3.5 – 3.9	-	-
kJ/m ²	0.613 – 0.683	-	-

Property values listed are typical for laminates with 62% fiber volume.

Wet = 14 day water immersion at 160°F (71°C)

* Wet = 24 hour immersion at 160°F (71°C) and 95% relative humidity

APPLICATION NOTES

Recommendations for lay-up and cure of CYCOM 970 are given below. For additional information contact your Cytec aerospace materials representative.

Figure 2 | Recommended Lay-up Procedure for Honeycomb Core L-9

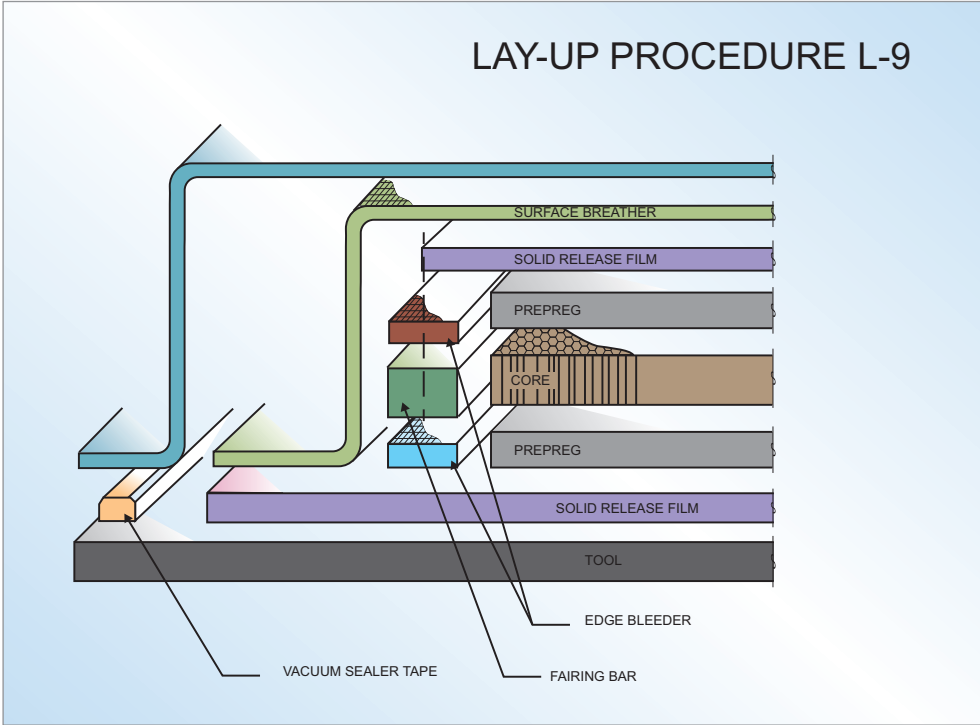


Figure 3 | Recommended Lay-up Procedure for Laminates L-8

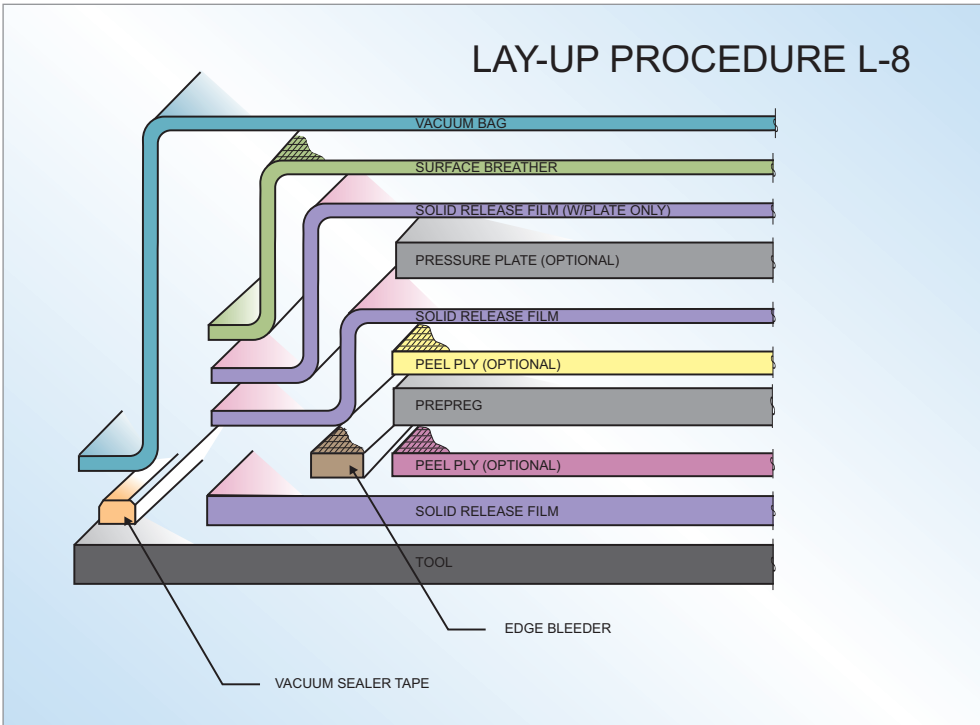
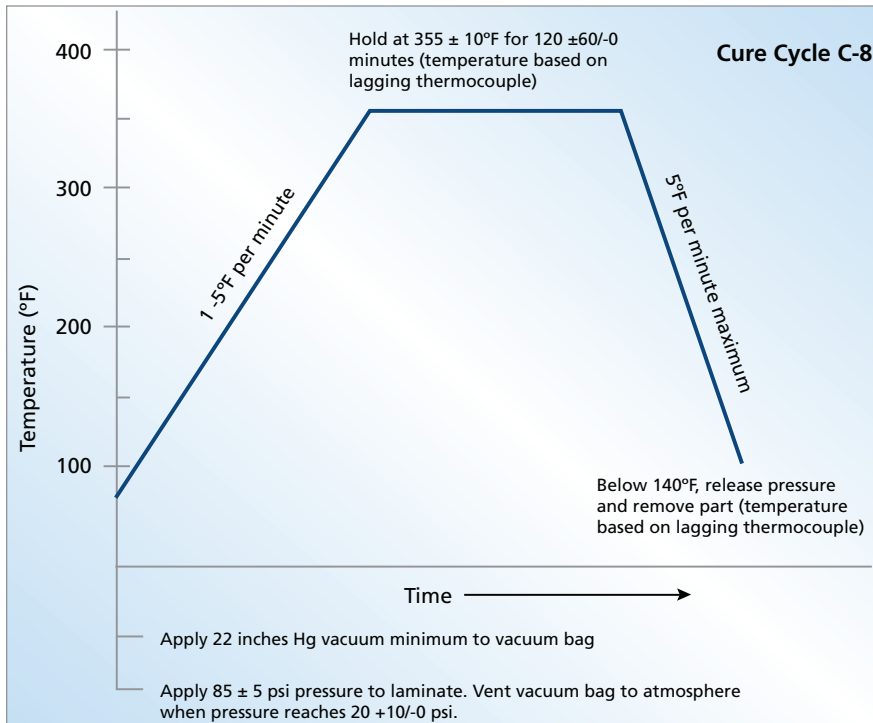


Figure 4 | Recommended Cure Procedure C-8



COMPATIBLE PROCESSING MATERIALS

The following materials are recommended for use with CYCOM 970. For additional information please contact your Cytec Aerospace Materials Representative.

Table 3 | Adhesive Materials

Film Adhesive	METLBOND 1515-3, METLBOND 1515-4
Surfacing Film	SURFACEMASTER 905

Table 4 | Processing Materials

Sealant Tape	SM5127, SM5153, SM5142, SM5144
Breather	RC3000-10, A3000-4
Release Film	A6200, A5000
Bagging Film	Stretch Vac 2000, Stretch Vac 3000, HS8171
Peel Ply	PFG 60001, PFG 60002, PFG 51789

PRODUCT HANDLING AND SAFETY

Cytec Industries Inc. recommends wearing clean, impervious gloves when working with epoxy resins 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 should be in accordance with local, state, and federal regulations.

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