CYCOM® 985 EPOXY RESIN SYSTEM

TECHNICAL DATA SHEET

DESCRIPTION

CYCOM® 985 is a 350°F (177°C) curing epoxy resin system.

CYCOM 985 is designed for use where a balance of performance and processing characteristics is required. It has excellent structural performance and good impact resistance.

CYCOM 985 is co-curable with structural adhesives and will produce outstanding thin-skinned sandwich structures.

CYCOM 985 allows thick section construction without exotherm problems. Optimum properties are achieved by curing under autoclave pressure from 45 to 100 psi (as appropriate to panel configuration) at 350°F (177°C) for two hours.

CYCOM 985 prepregs have good tack and drape and an out-time of two weeks at room temperature.

FEATURES & BENEFITS

- Modified epoxy system
- Excellent hot/wet strength retention
- 350°F (177°C) cure
- Good impact resistance
- 300°F (149°C) service temperature
- Controlled flow
- Ease of processing
- Good tack and drape
- 14 day shop life
- Shelf life of 6 months at 0°F (-18°C)

SUGGESTED APPLICATIONS

- Primary and secondary aircraft structures

CHARACTERISTICS

Table 1 | Typical Neat Resin Properties

	Tg, °C * Dry / Wet	Modulus, msi	Stress, ksi	Strain, %	Work, lb/in^3
Flexural Dynamic Mechanical Analysis of Neat Resin	228 / 175	0.590	22.5	4.5	570

* **NOTE:** Tg data is not applicable for U.S. export control classification or licensing. For export-related information please contact us.

Neat Resin Density = 1.25 g/cc

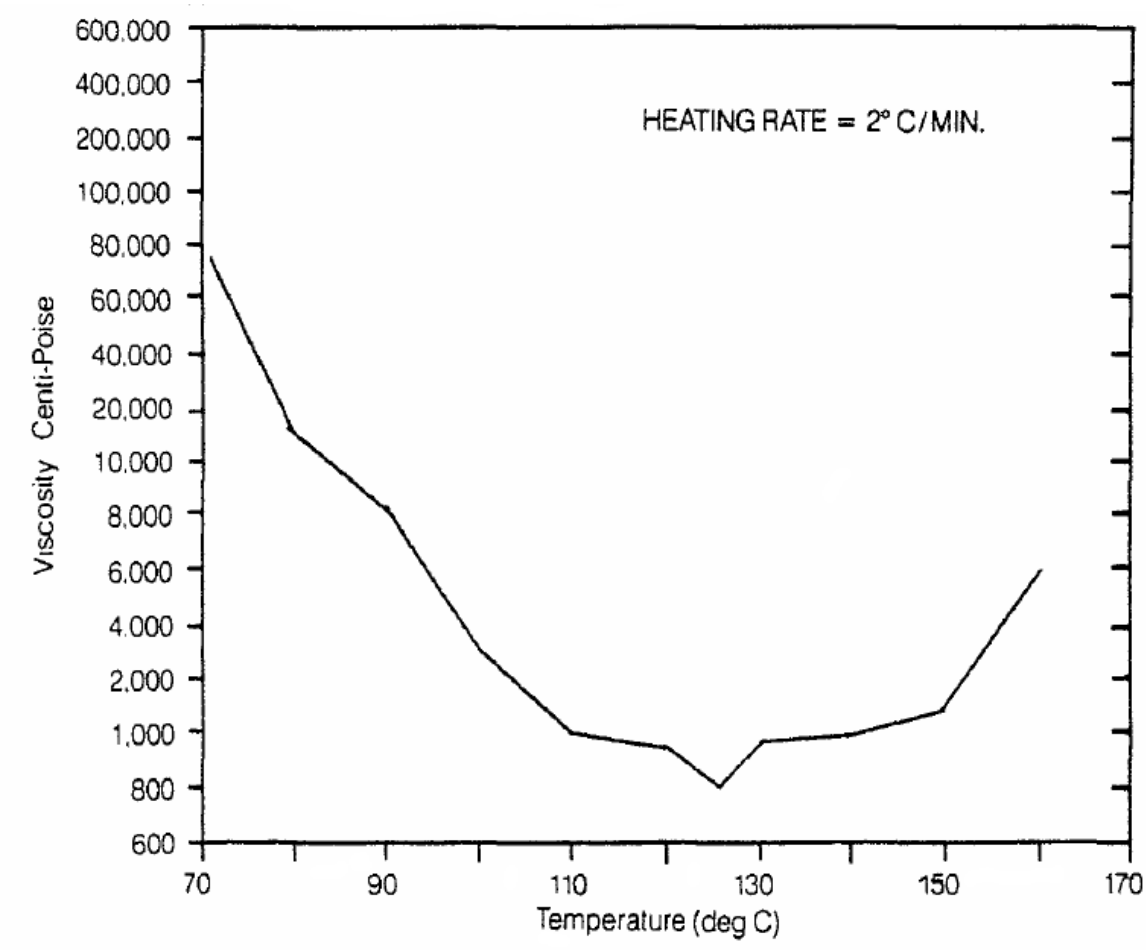

Figure 1 | CYCOM 985 Viscosity Profile versus Temperature

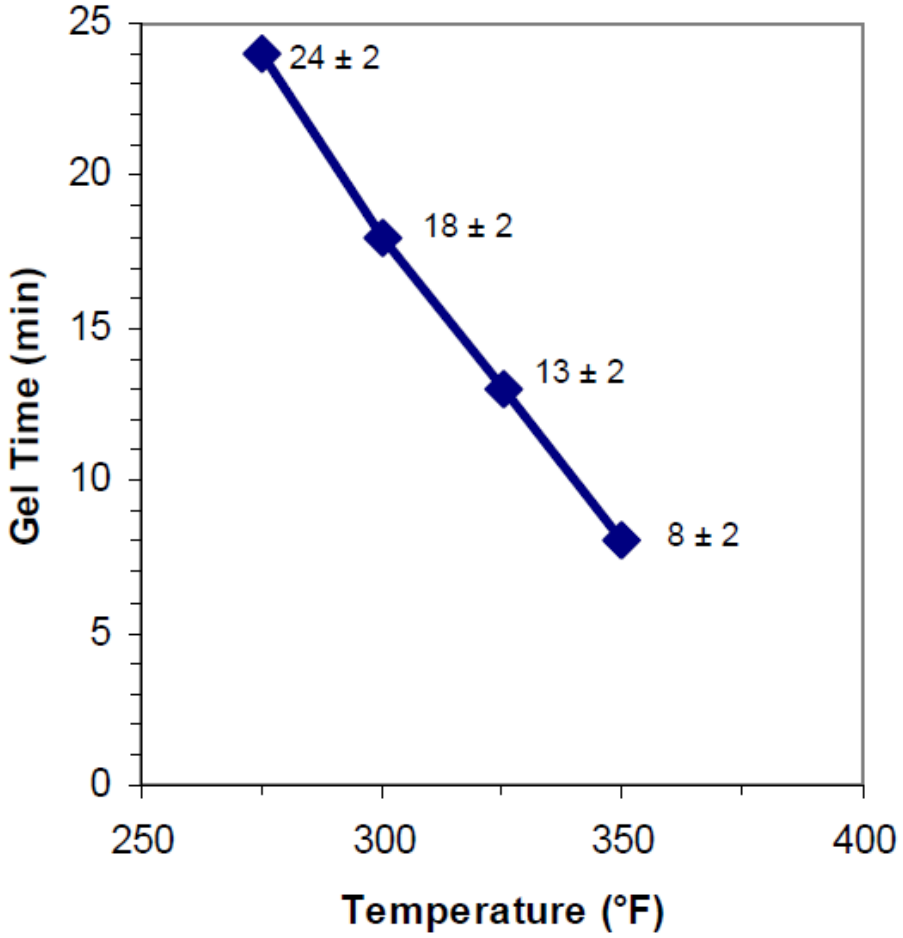

Figure 2 | CYCOM 985 Gel Time versus Temperature

Table 2 | Typical Prepreg Properties

Fiber	Kevlar 49 Fiber K-285	Standard Modulus Carbon Uni-Tape 145 gsm	Carbon Plain Weave	E-Glass 7781
Resin Content	50 ± 2	37 ± 2	40 ± 2	36 ± 2
Flow, %	33 ± 7	24 ± 7	15 ± 7	20 ± 7
Volatile Content, % max.	2.0	2.0	1.0	2.0

PROPERTIES

Table 3 | Mechanical Performance

Fiber	Kevlar 49 Fiber K-285	Carbon Uni-Tape 145 gsm	Carbon Fabric 3K70 PW	Glass Fabric 7781
Number of Plies	10	8	14	10
Cure Pressure, psi (MPa)	85 (6)	85 (6)	85 (6)	45 (31)
Cure Time, minutes	120	120	120	90
Heat-up rate, °F/min (°C/min)	4.5 (2.5)	4.5 (2.5)	4.5 (2.5)	3 (2)
Physical Properties				
Ply Thickness, in (mm)	0.0092 (0.234)	0.0058 (0.147)	0.0076 (0.20)	0.0096 (0.24)
Specific Gravity	1.35	1.54	1.55	1.89
Fiber Volume, %	50	56	57	48
0° Tensile Strength, ksi (GPa)				
75°F (24°C)	-	287.2 (1980)	-	-
0° Tensile Strain, micro-in/in				
75°F (24°C)	-	15800	-	-
0° Tensile Modulus, Msi (GPa)				
-65°F (-54°C)	4.5 (31)	17.5 (121)	-	-
75°F (24°C)	4.3 (30)	18.5 (128)	9.0 (59)	3.7 (26)
160°F (71°C)	4.1 (28)	18.7 (129)	8.7 (60)	-
270°F (132°C)	3.4 (23)	19.3 (133)	8.6 (59)	-
350°F (177°C)	3.0 (21)	-	8.3 (57)	3.0 (21)
90° Tensile Strength (20 ply), ksi (MPa)				
-65°F (-54°C)	-	6.1 (42)	-	-
75°F (24°C)	-	5.8 (40)	111 (765)	-
160°F (71°C)	-	5.3 (37)	-	-
270°F (132°C)	-	4.9 (34)	-	-
90° Tensile Strain, micro-in/in				
75°F (24°C)	-	-	12345	-
90° Tensile Modulus (20 ply), Msi (GPa)				
-65°F (-54°C)	-	1.4 (9.7)	-	-
75°F (24°C)	-	1.2 (8.3)	-	-
160°F (71°C)	-	1.0 (6.9)	-	-
270°F (132°C)	-	0.9 (6.2)	-	-

Table 4 | Mechanical Performance (Continued)

Fiber	Kevlar 49 Fiber K-285	Carbon Uni-Tape 145 gsm	Carbon Fabric 3K70 PW	Glass Fabric 7781
Number of Plies	10	8	14	10
Cure Pressure, psi (MPa)	85 (6)	85 (6)	85 (6)	45 (31)
Cure Time, minutes	120	120	120	90
Heat-up rate, °F/min (°C/min)	4.5 (2.5)	4.5 (2.5)	4.5 (2.5)	3 (2)
Compression Strength, ksi (GPa)				
-65°F (-54°C)	34 (234)	185 (1275)	92 (635)	-
75°F (24°C)	31 (214)	180 (1241)	123 (848)	86 (593)
75°F (24°C), Wet	29 (165)	175 (1207)	93 (644)	-
160°F (71°C)	26 (179)	170 (1172)	105 (724)	-
Compression Modulus, Msi (GPa)				
-65°F (-54°C)	4.4 (30)	17.9 (124)	8.5 (59)	-
75°F (24°C)	4.2 (29)	17.9 (124)	8.8 (61)	3.7 (26)
160°F (71°C)	4.4 (30)	17.8 (123)	8.5 (59)	-
270°F (132°C)	4.3 (30)	17.5 (121)	8.5 (59)	*
350°F (177°C)	3.8 (26)	-	-	3.1 (21)
Short Beam Shear, ksi (Mpa)				
-65°F (-54°C)	4.2 (29)	17.4 (120)	13.9 (90)	-
75°F (24°C)	5.4 (37)	17.0 (117)	11.0 (74)	10.6 (73)
75°F (24°C), Wet	5.0 (3.4)	10.9 (75)	-	-
160°F (71°C)	5.8 (40)	11.5 (79)	9.0 (62)	8.9 (61)
160°F (71°C), Wet	4.6 (32)	9.0 (62)	-	-
270°F (132°C)	4.3 (30)	8.8 (61)	8.1 (55)	7.5 (52)
270°F (132°C), Wet	2.2 (15)	6.3 (43)	-	-
350°F (177°C)	2.0 (14)	-	-	3.7 (26)
350°F (177°C), Wet	1.5 (10)	-	-	-
Celion Fiber, 36 ply Quasi Lay-up at Room Temperature				
Compression Strength After Impact (1500 in-lb/in laminate thickness):			28 ksi (193 MPa)	

APPLICATION NOTES

Preparation for Laminate Curing

Treat surfaces that lay-up will touch with a release agent. As each ply of material is positioned, work out any wrinkles or entrapped air with a paddle or roller before removing the backing. Take care not to distort the material during lay up. Insert a thermocouple into the lay-up near the center ply of the thickest edge section, outside the net trim line.

To eliminate porosity, keep the resin under pressure during cure with the use of a compressible dam. Use permeable fluorocarbon coated fabric to facilitate resin bleed. This material should be placed directly on the lay-up with sufficient layers of dry glass fabric (bleeder plies) to absorb the excess resin. Non-permeable fluorocarbon coated fabric should be placed over bleeder plies to protect the bag system in vacuum or autoclave cures.

Install a vacuum bag by standard techniques. Insert at least two vacuum ports through the bag, connecting one to a vacuum source and the other, at a point furthest away from the source, to a calibrated vacuum gage. Position part in oven or autoclave and draw vacuum to check for bag or system leaks.

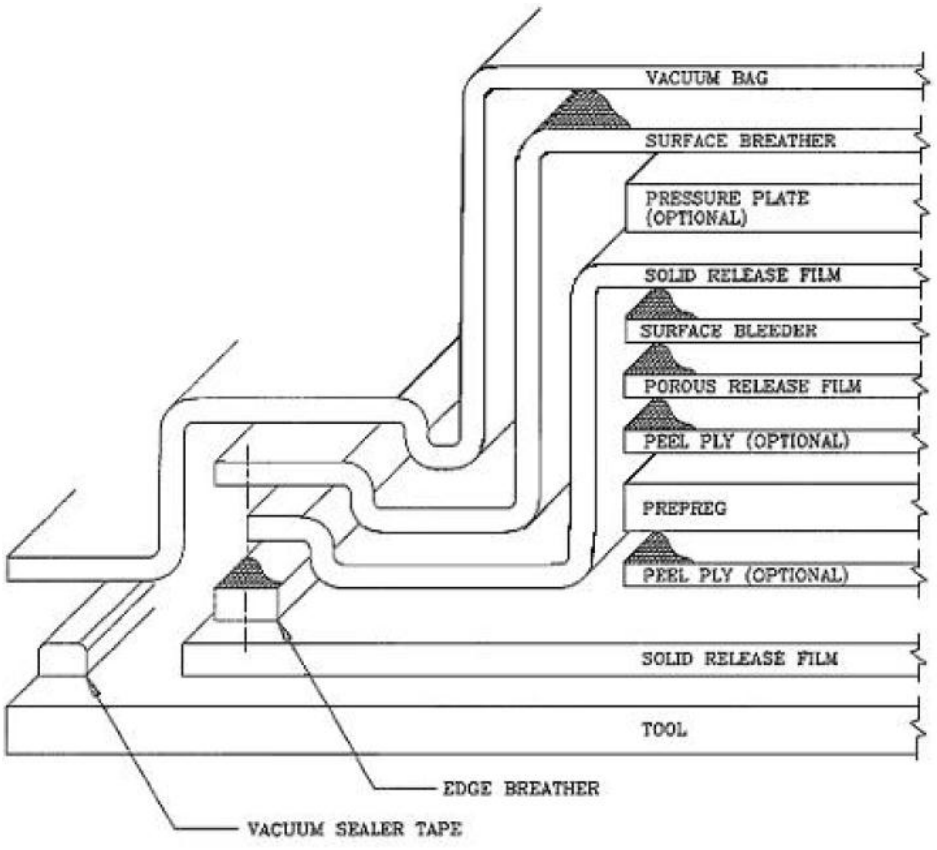

Figure 3 | Recommended bagging for CYCOM 985

Recommended Cure Cycles

Figure 4 shows the standard cure cycle for CYCOM 985 resin system. Figure 5 shows a step cure that also provides good results for those applications requiring controlled flow. Depending on thickness and laminate configuration, cure cycle parameters may need to be altered.

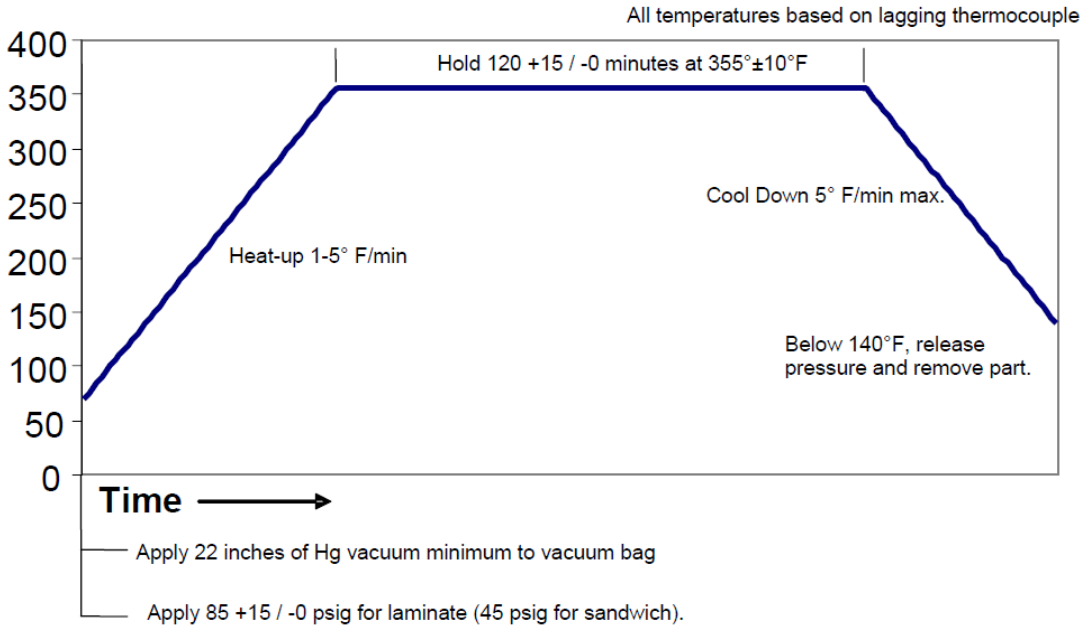

Figure 4 | Standard Cure Cycle for CYCOM 985

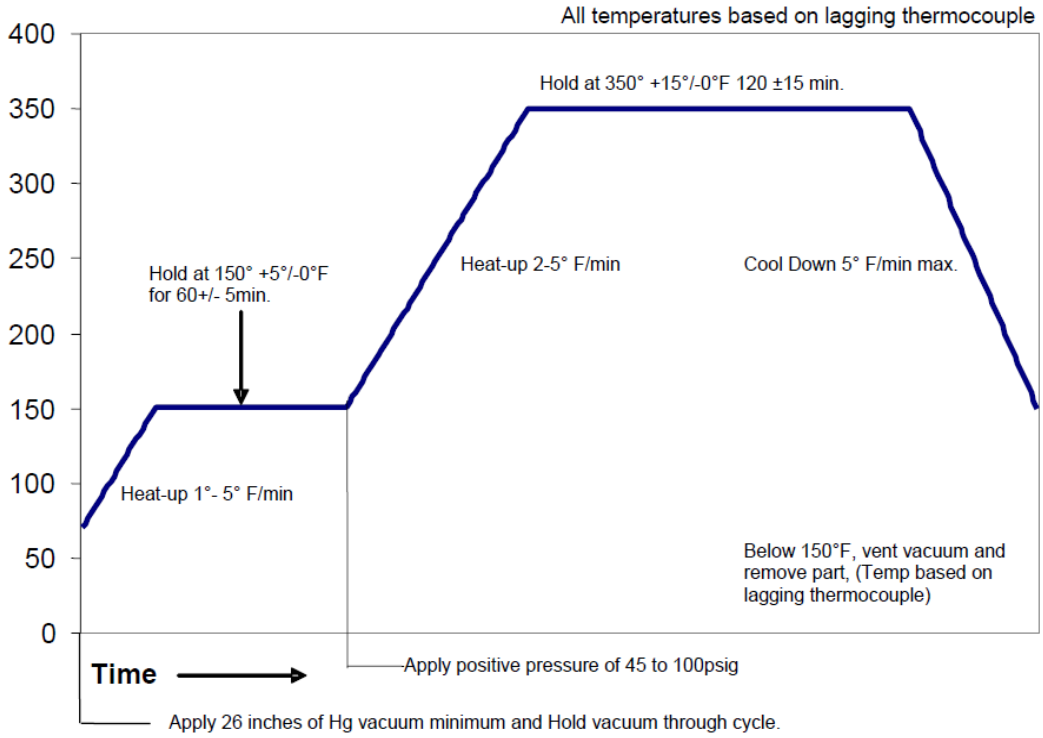

Figure 5 | Step Cure Cycle for CYCOM 985 for Flow Control

PRODUCT HANDLING AND SAFETY

Cytec Engineered Materials recommends wearing clean, impervious gloves when working with epoxy resin systems 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 any Cytec Engineered Materials Office.

DISPOSAL OF SCRAP MATERIAL

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

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