CYCOM® 977-2 AND 977-2A EPOXY RESIN SYSTEMS

CYCOM® 977-2 and CYCOM® 977-2A are 350°F (177°C) curing toughened epoxy resins with a 338°F (170°C) dry and 275°F (135°C) wet Glass Transition temperatures. CYCOM® 977-2(A) is formulated for autoclave or press molding. Unidirectional tape and woven fabric impregnated with CYCOM 977- 2(A) resins will retain tack for at least 10 days at 72°F (22°C) and has a long mechanical out life suitable for fabrication of large structures.

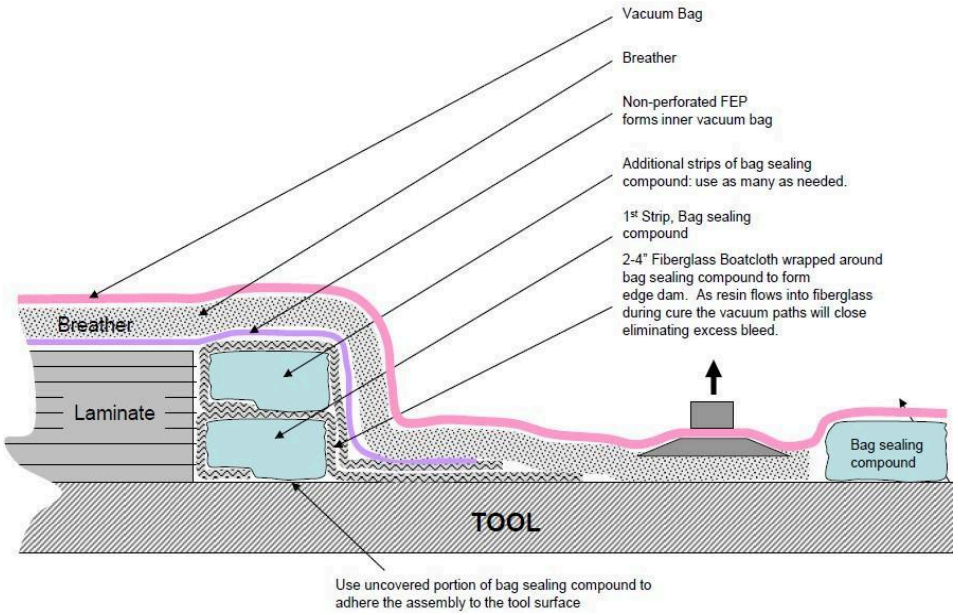
Features and Benefits

- Shelf Life of 12 months at 0°F (-18°C), minimum 10 days at 73°F (23°C)
- Controlled matrix flow and easy processing
- Excellent impact resistance
- Available in broad range of fibres and forms, including tape, fabric and roving
- 338°F (170°C) dry and 275°F (135°C) wet DMA Tg onset
- Straight-up cure cycle at 350°F (177°C)
- Autoclave or press mold processing
- Long tack life

APPLICATIONS

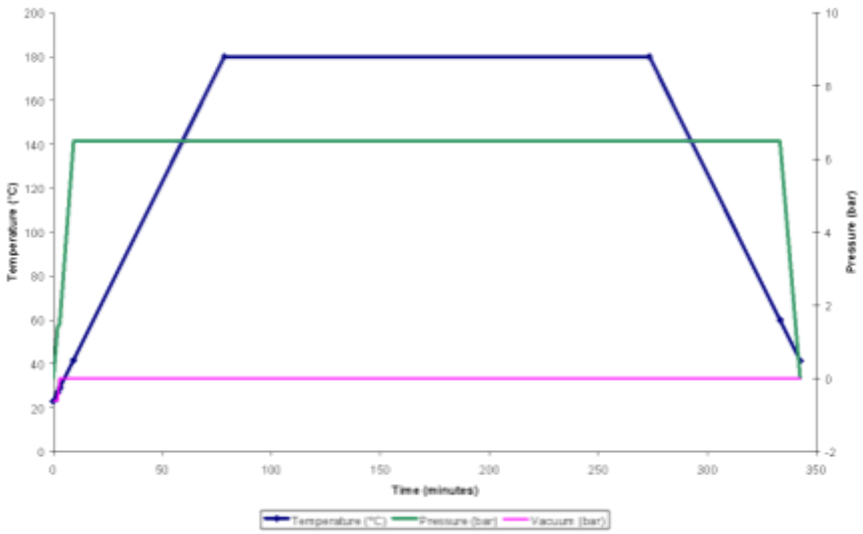
- Aircraft primary and secondary structure (fuselage, VTP, HTP, flaps, etc)
- Space structure
- Ballistics
- Cryogenic tanks
- Any application where impact resistance and light weight are required

RECOMMENDED BAGGING



CURE CYCLE

Parameter	Units
Vacuum	0.6 bar minimum
Pressure rate	0.7 bar/min
Pressure	6 - 7 bar
Ramp rate	2 ± 1°C/minute
Cure temperature	180 ± 5°C
Hold Time	180 - 210 minutes
Cooling	to below 60°C under pressure



PHYSICAL PROPERTIES

Property		Test Method
Cured resin density	1.31g/cm^3	ISO 1183
T_g dry:	170°C	EN6032
T_g wet:	135°C	

MECHANICAL PROPERTIES

Property	Condition	Test Method	977-2-34%-12KHTS-196[2]	977-2-34%-24KIMS-196[3]	977-2A-42%-6KHTA-2x2T-285[4]	977-2-40%-3KHTA-PW-193[5]	977-2A-37%-3KHTA-5H-280[6]
0° TS, MPa (ksi)	RT/Dry	EN2561 (ASTM D3039)	2083 (302)	2859 (415)	779 (113)	797 (116)	916 (133)
	90°C/Wet[1]		1928 (280)	2716 (394)	800 (116)	767 (111)	942 (137)
0° TM, GPa (Msi)	RT/Dry	EN2561 (ASTM D3039)	136 (19.7)	175 (25.4)	60 (8.70)	61 (8.85)	68 (9.86)
	90°C/Wet[1]		131 (19.0)	173 (25.1)	61 (8.85)	63 (9.14)	69 (10.0)
0° CS, MPa (ksi)	RT/Dry	EN2850 B (ASTM D6641)	1473 (214)	1688 (245)	676 (98.0)	679 (98.5)	910 (132)
	90°C/Wet[1]		1179 (171)	1246 (181)	527 (76.4)	532 (77.2)	651 (94.4)
0° CM, GPa (Msi)	RT/Dry	EN2850 B (ASTM D6641)	120 (17.4)	141 (20.5)	56 (8.12)	55 (7.98)	57 (8.27)
	90°C/Wet[1]		119 (17.3)	148 (21.5)	58 (8.41)	56 (8.12)	60 (8.70)
IPSS, MPa (ksi)	RT/Dry	EN6031 (ASTM D3518)	127 (18.4)	107 (15.5)	91 (13.2)	135 (19.6)	119 (17.3)
	90°C/Wet[1]		87 (12.6)	83 (12.0)	57 (8.27)	93 (13.5)	82 (11.9)
IPSM, GPa (Msi)	RT/Dry	EN6031 (ASTM D3518)	4.2 (0.609)	3.94 (0.571)	3.93 (0.570)	4.3 (0.624)	4.54 (0.658)
	90°C/Wet[1]		3.05 (0.442)	3.3 (0.479)	3.1 (0.450)	3 (0.435)	3.94 (0.571)
ILSS, MPa (ksi)	RT/Dry	EN2563 (ASTM D2344)	119 (17.3)	107 (15.5)	85 (12.3)	78 (11.3)	81 (11.7)
	90°C/Wet[1]		69 (10.0)	61 (8.85)	53 (7.69)	50 (7.25)	52 (7.54)
CAI@30J, MPa (ksi)	RT/Dry	EN 6038 (ASTM D7136 D7137)	211 (30.6)	205 (29.7)	247 (35.8)	233 (33.8)	242 (35.1)
	90°C/Wet[1]		-	-	205 (29.7)	-	189 (27.4)

[1] Wet conditioning at 70°C/85% R.H.

[2] Fibre dominating properties normalised to CPT 0.188mm

[3] Fibre dominating properties normalised to CPT 0.186mm

[4] Fibre dominating properties normalised to CPT 0.318mm

[5] Fibre dominating properties normalised to CPT 0.208mm

[6] Fibre dominating properties normalised to CPT 0.280mm

PRODUCT FORMS

Available in a wide variety of product forms and widths; please contact Syensqo Customer Service representative.

STORAGE

Storage Life is 365 days minimum from date of manufacture stored at -18°C or below, in a sealed container; Handling Life is 10 days minimum if stored at 23°C and 65% R.H. Duration of Mechanical Life is up to 30 days if stored in the controlled environment (23°C, 65% R.H.).

EXOTHERM

CYCOM® 977-2 prepregs are reactive formulations which can undergo severe exothermic heat up during the initial curing process if incorrect curing procedures are followed.

Great care must be taken to ensure that safe heating rates, dwell temperatures and lay-up/bagging procedures are adhered to, especially when moulding solid laminates in excess of 10mm (0.40in) thickness. The risk of exotherm increases with layup thickness and increasing cure temperature. It is strongly recommended that trials, representative of all the relevant circumstances, are carried out by the user to allow a safe cure cycle to be specified. It is also important to recognise that the model or tool material and its thermal mass, combined with the insulating effect of breather/bagging materials can affect the risk of exotherm in particular cases.

HEALTH & SAFETY

Please refer to the product MSDS for safe handling, personal protective equipment recommendations and disposal considerations.