

CYCOM® 7714A

Ideally suited to aerospace applications CYCOM® 7714A resin is a 250°F (121°C) curing epoxy resin with good 200°F (93°C) dry and 160°F (71°C) wet service capability.

It is formulated for autoclave processing, but it has been successfully processed by press molding processes. It is completely co-curable with a number of other resins, providing considerable design flexibility with respect to the use of hybrid lay-ups.

This product features a standard cure of two hours at 250°F (121°C). No post cure is required for 160°F (71°C) wet service capability. CYCOM® 7714A is impregnated via solution and hot melt techniques.

Typical applications for CYCOM® 7714A include aircraft seats, interiors, and control surfaces.

Features and Benefits

- 250°F (121°C) Cure
- Flame Retardant.
- Used as a self-adhesive system
- Meets NASA outgassing requirements
- Large Industry Database
- Laminate and sandwich panel usage
- 200°F (93°C) dry service temperature
- 160°F (71°C) wet service temperature
- Autoclave or press mold process
- Shelf life 6 months at 0°F (-18°C)
- Shop life 10 days at 75°F (24°C)
- Co-cureable with CYCOM® 7701, CYCOM® 7714 and CYCOM® 97714A systems

CHARACTERISTICS

Table 1 | Physical Properties

| Property | CYCOM 7714A | Test method |
|-----------------------------------|--|-------------|
| Cured Resin Density pcf (g/cc) | 76.2 – 78.7 (1.22 – 1.26) | ASTM D 792 |
| Shelf Life | 6 months at or below 0°F (-18°C) from date of shipment | |
| Shop Life | 10 days at or below 75°F (24°C) | |

Table 2 | Product Availability

| Property | Description |
|-------------|---|
| Roll Width | 12, 24, 60 in (30.5, 61, 152 cm) wide rolls |
| Roll Length | 60 yds (55 m) |



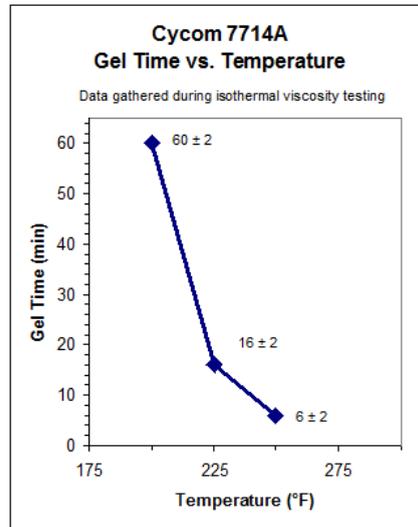
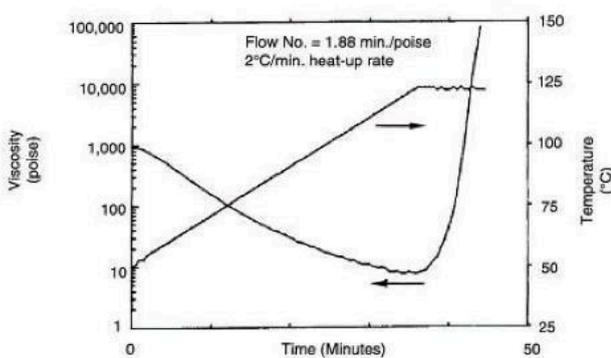


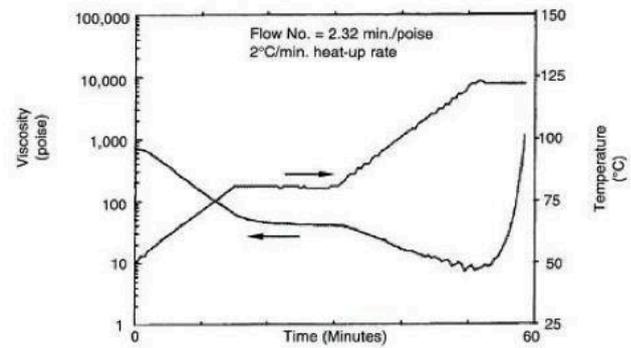
Figure 1 | CYCOM® 7714A Gel Time vs. Temperature

Resin Viscosity



7714A Viscosity Profile

Straight Heat-up Cure Cycle to 250°F (121°C)



7714A Viscosity Profile

Stepped Cure Cycle: Heat up to 175°F (80°C), hold for 15 minutes, heat up to 250°C (121°C)

Figure 2 | CYCOM® 7714A Viscosity Profile for varying cure cycles



PROPERTIES
Table 3 | Mechanical Properties of CYCOM® 7714A Prepreg for Standard Modulus Carbon Fiber [33 Msi (228 Gpa)]

| Property | Test Condition | Plain Weave T300, HTA40 | 5HS T300, T650-35 | 8HS T300 | Test Method |
|--|---|----------------------------|--|---|----------------------------|
| 0° Tensile Strength ksi (MPa) | -65°F (-54°C) 75°F (24°C) 160°F (71°C) 160°F (71°C)/ wet | 280 (1930) - - - | 120-151 (827-1040) 120-151 (827-1040) - - | 75-110 (517-758) 75-110 (517-758) 70-105 (483-724) 60-95 (414- 655) | ASTM D 638/ ASTM D 3039 |
| 0° Tensile Modulus Msi (GPa) | -65°F (-54°C) 75°F (24°C) 160°F (71°C) 160°F (71°C)/ wet | - - - - | 9-10.5 (62-72) 9-10.5 (62-72) - - | 8-11 (55-76) 8-11 (55-76) 7-10 (48-69) 7-10 (48-69) | ASTM D3039 |
| 0° Tensile Failure Strain % | -65°F (-54°C) 75°F (24°C) 160°F (71°C) 160°F (71°C)/ wet | - - - - | 1.0-1.3 1.0-1.3 - - | 0.8-1.3 0.8-1.3 1.0-1.3 0.5-1.3 | ASTM D 3039 |
| 0° Compression Strength ksi (MPa) | -65°F (-54°C) 75°F (24°C) 160°F (71°C) 160°F (71°C)/ wet | - - - - | 100-135 (689-931) 100-135 (689-931) - 30-60 (207-414) | 75-95 (517-655) 75-95 (517-655) 50-80 (345-552) 35-60 (241-414) | ASTM D 6641 |
| 0° Compression Modulus Msi (GPa) | -65°F (-54°C) 75°F (24°C) 160°F (71°C) 160°F (71°C)/ wet | - - - - | 8-11 (55-76) 8-11 (55-76) - 8-11 (55-76) | 8-10 (55-69) 8-10 (55-69) 7.5-10 (52-69) 7.5-10 (52-69) | ASTM D 6641 |
| 0° Flexural Strength ksi (MPa) | -65°F (-54°C) 75°F (24°C) 160°F (71°C) 160°F (71°C)/ wet | - - - - | - - - - | 100-130 (689-896) 100-130 (689-896) 75-100 (517-689) 40-60 (276-414) | ASTM D 790 |
| 0° Flexural Modulus Msi (GPa) | -65°F (-54°C) 75°F (24°C) 160°F (71°C) 160°F (71°C)/ wet | - - - - | - - - - | 7-9 (50-62) 7-9 (50-62) 6-8 (41-55) 6-8 (41-55) | ASTM D 790 |
| 0° Interlaminar Shear Strength ksi (MPa) | -65°F (-54°C) 75°F (24°C) 160°F (71°C) 160°F (71°C)/ wet | - - - - | 9-12 (62-83) 9-12 (62-83) - 2-5 (14-34) | 8-10 (55-69) 8-10 (55-69) 6-8 (41-55) 3-5 (21-34) | ASTM D 2344 |

Wet condition: water immersion for 14 days at 160°F (71°C).



Table 4 | Mechanical Properties of CYCOM® 7714A Prepreg for Unidirectional Tape

| Property | Test Condition | Standard Modulus T300, T650-35, HTA40 | High Modulus M46J | Test Method |
|---|--|---|--|------------------------------|
| 0° Tensile Strength ksi (MPa) | -65°F (-54°C) 75°F (24°C) 160°F (71°C) | 260-300 (1790-2070) 260-350 (1790-2410) 230-320 (1590-2210) | - 310-355 (2140-2450) - | ASTM D 3039 |
| 0° Tensile Modulus Msi (GPa) | -65°F (-54°C) 75°F (24°C) 160°F (71°C) | 15-22 (103-152) 16-21 (110-145) 14-23 (97-159) | - 34-38 (230-260) - | ASTM D3039 |
| 0° Tensile Failure Strain % | -65°F (-54°C) 75°F (24°C) 160°F (71°C) | 0.95-1.25 1.05-1.35 1.05-1.35 | - - - | ASTM D 3039 |
| 0° Compression Strength ksi (MPa) | 75°F (24°C) 160°F (71°C) 160°F (71°C)/ wet | 170-240 (1170-1660) 108-200 (745-1380) - | 120-185 (827-1280) 115-157 (793-1080) 77-134 (531-924) | ASTM D 6641 |
| 0° Compression Modulus Msi (GPa) | 75°F (24°C) | 11-20 (76-138) | 31-34 (214-234) | ASTM D 6641 |
| 0° Flexural Strength ksi (MPa) | 75°F (24°C) | 218-266 (1500-1830) | - | ASTM D 790 |
| 0° Interlaminar Shear Strength ksi (MPa) | -65°F (-54°C) 75°F (24°C) 160°F (71°C) | 13-17 (90-117) 11-13 (76-90) 7-11 (48-76) | - 10-13 (69-90) - | ASTM D 2344 |
| Compression After Impact, Strength ksi (MPa) | 75°F (24°C) 160°F (71°C)/wet | - - | 36-52 (248-359) 29-36 (200-250) | ASTM D 7136 / ASTM D 7137 |
| Open Hole Compression Strength ksi (MPa) | -100°F (-73°C) 75°F (24°C) 160°F (71°C) 160°F (71°C)/ wet | - - - - | 34-54 (234-372) 33-41 (228-283) 30-36 (207-248) 28-33 (193-228) | ASTM D 6484 |
| Filled Hole Compression Strength ksi (MPa) | -100°F (-73°C) 75°F (24°C) 160°F (71°C) 160°F (71°C)/ wet | - - - - | 40-62 (278-428) 40-62 (278-428) 37-45 (255-310) 35-42 (241-290) | ASTM D 6742 |

Wet condition: water immersion for 6 days at 160°F (71°C).



PROCESSING

Recommended Cure Cycles

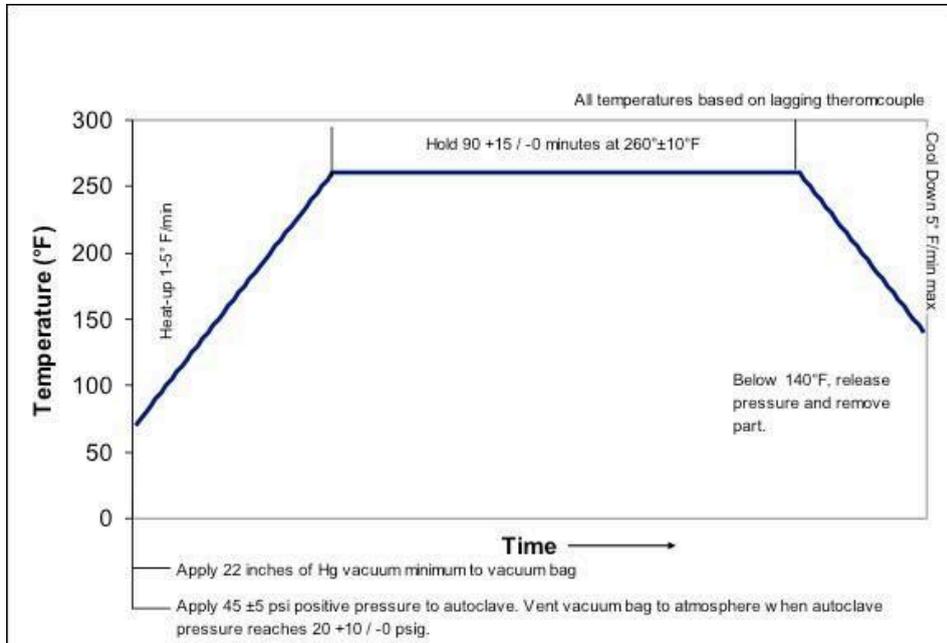


Figure 3 | CYCOM® 7714A Straight Cure Cycle

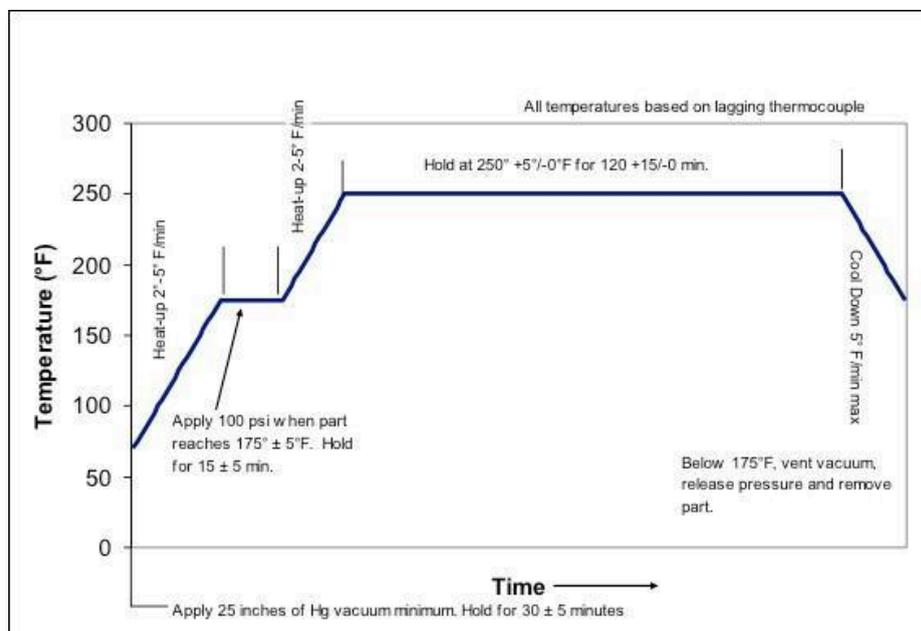


Figure 4 | CYCOM® 7714A Step Cure Cycle



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 gauge. Position part in oven or autoclave and draw vacuum to check for bag or system leaks.

The following figures show the recommended lay-ups for CYCOM® 7714A materials:

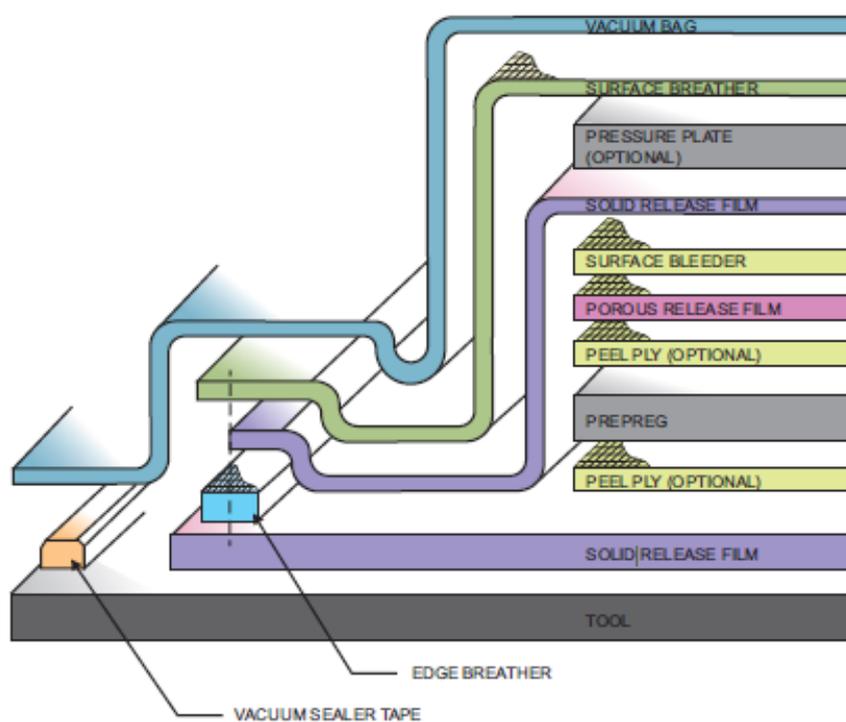


Figure 5 | Bleed Lay-up



