Toray EF8020

Toray Advanced Composites

PRODUCT DATA SHEET

DESCRIPTION

Toray EF8020 adhesive film is a high-strength epoxy adhesive formulation supplied in the form of a lightweight flexible film. It is intended for metal-to-metal or sandwich core to skin bonds and has a strong self-filleting action in honeycomb-to-skin bonds. Toray EF8020 adhesive film is protected on one side by a release paper and on the other by a polythene separator. A lightweight polyester carrier is incorporated into the adhesive film to ensure easy handling whilst cutting and positioning. Toray EF8020 is compatible for co-cure with 8020 prepreg and 8020 RAPI-PLY series.

FEATURES

- **Flexible low-to-medium cure schedule 70°C (158°F) to 130°C (266°F)**
- **Accurate control of adhesive distribution**
- **Ideal for honeycomb sandwich construction**
- **Bonding in both metallic and composite structures**
- **Suitable for press molding, autoclave, and vacuum bag cure**
- **No solvents, low volatile content**
- **Available in a range of surface weights (100g/m^2, 200g/m^2, and 300g/m^2)**

PRODUCT TYPE

70–130°C (158–266°F) Cure,
Modified Epoxy Structural Film Adhesive

TYPICAL APPLICATIONS

- Metal-to-metal or sandwich-core-to-skin bonds
- Has a strong self-filleting action in honeycomb-to-skin bonds

SERVICE TEMPERATURE

121°C (250°F)

SHELF LIFE

Out Life:	30 days at 20°C (68°F)
Storage Life:	12 months at -18°C (0°F)

Out life is the maximum time allowed at ambient temperature before cure.

TYPICAL NEAT RESIN PROPERTIES

Density	1.20 g/cm^3 at 23°C (73°F)
T_g after 1 hour at 120°C (DMA)	Onset: 102°C (215°F) Peak tan: 116°C (240°F)

To avoid moisture condensation

Following removal from the freezer, allow the EF8020 to reach room temperature before opening the polythene bag. Typically, the thaw time for a full roll of material from storage at -18°C (0°F) will be 4 to 6 hours.

TYPICAL ADHESIVE PROPERTIES

Toray EF8020 Resin Film Weight (gsm)	Test Description	Condition	Method	Result
100	Tensile Lap Shear (LS)	RTD	ASTM D 1002	27 MPa/4.0 ksi
300	Climbing Drum Peel (CDP)	RTD	ASTM D 1781-98	430 N/75 mm
300	Tensile Lap Shear (LS)	RTD	ASTM D 1002	38 MPa/5.5 ksi

Climbing drum peel (CDP) RTD at 20°C (68°F)
Molding conditions for the test samples were as follows: Heated for 2 hours at 120°C (248°F). 30 P.S.I. vented vacuum pressure applied.

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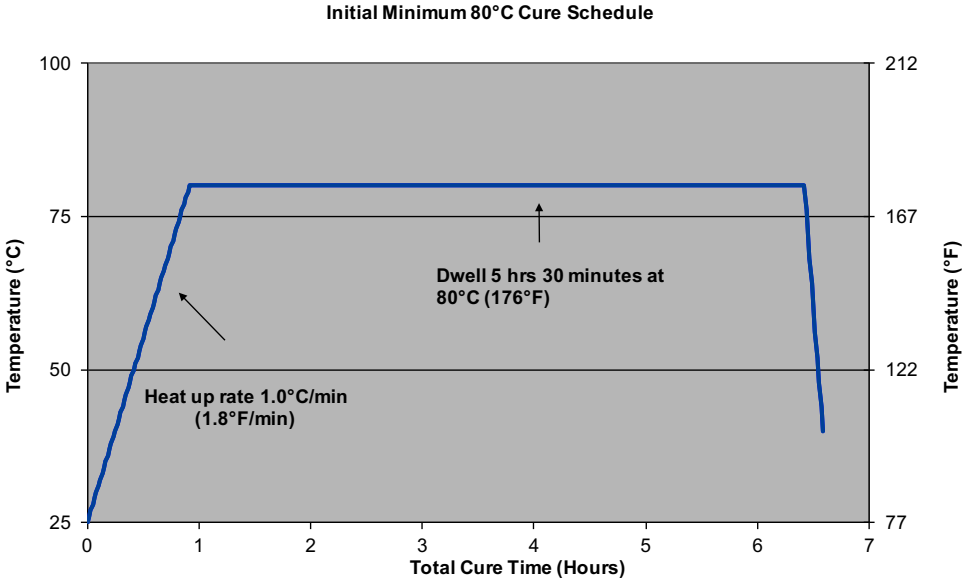
TYPICAL CURE PROFILES

80°C (176°F) cure temperature Total Time: 7 hours

1.0°C (1.8°F)/minute ramp to 80°C (176°F)

5 hours 30 minutes dwell at 80°C (176°F)



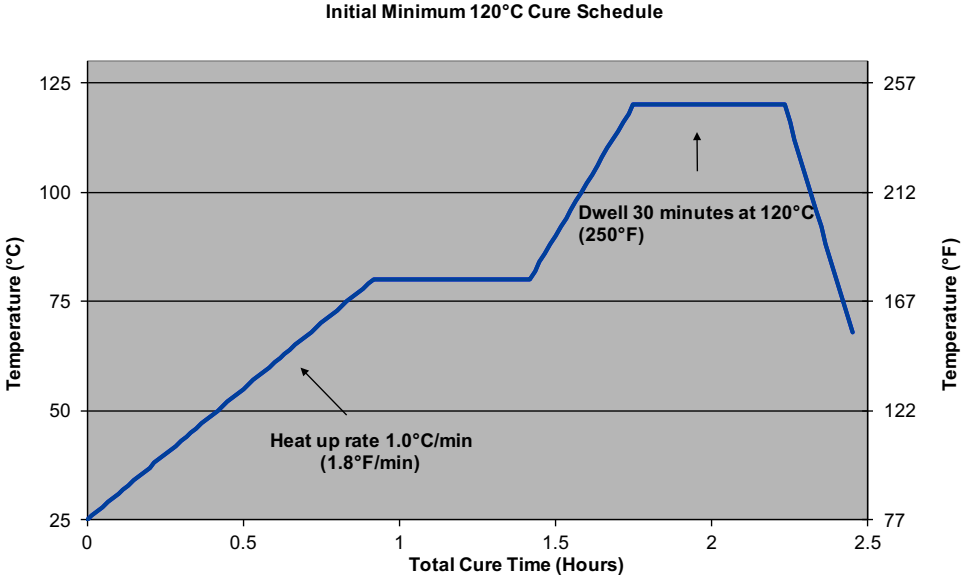
120°C (248°F) cure temperature Total Time: 2 hr 20 min

1.0°C (1.8°F)/minute ramp to 80°C (176°F)

30 minute dwell at 80°C (176°F)

2.0°C (3.6°F)/minute ramp to 120°C (176°F)

30 minute dwell at 120°C (176°F)



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RECOMMENDED DWELL TIMES

Recommended Cure Temperature °C (°F)	Recommended Cure Times (Hrs)
70°C (158°F)	8
80°C (176°F)	5.5
100°C (212°F)	2
120°C (248°F)	0.5

Caution: EF8020 resin film contains a reactive resin system and care must be taken to avoid exothermic heating during the initial cure.

POST CURE

- In applications demanding maximum temperature or environmental resistance, it is essential to develop the glass transition temperature to the maximum level by a suitable post cure.
- Ramp from initial cure temperature to 120°C (248°F) at 20°C/hour and hold for 30 minutes minimum, this post cure will result in a T_g (peak tan) of approximately 116°C (240°F).

PROCESSING

- It is important that all substrates to be adhered are degreased and free from contamination before use.
- EF8020 can be successfully cured by vacuum-only, autoclave, or press molding processes.

STANDARD ROLL QUANTITIES

Toray EF8020 Resin Film Weight Including Polyester Carrier (gsm)	Roll Length [Linear M (Ft)]	Width [M (Ft)]
100	20.5 (67)	1.25 (4)
200	20.5 (67)	1.25 (4)
300	20.5 (67)	1.25 (4)

The film is supplied on rolls with a polyester carrier. The film is protected by release paper on one side and polythene separator on the other.

HANDLING SAFETY

Observe established precautions for handling epoxy resins and fibrous materials.
For further information refer to the Safety Data Sheet, available from Toray Advanced Composites, Langley Mill.

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