

# Cocure Polyurethane Film

## Application Guide

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## Overview

3M™ Cocure Polyurethane Films are a family of abrasion resistant polyurethane films used to protect composite parts from erosion damage in service. These products are specifically designed for use in composite curing and bonding processes, with cure temperatures up to 400°F (204°C). They can be co-cured into composite surfaces or can be adhesively bonded onto precured parts with appropriate structural adhesives to improve the erosion or impact resistance of the composite. These films have been formulated for optimized bonding using 3M™ Scotch-Weld™ Structural Adhesive Films.

## Materials

- 3M™ Cocure Polyurethane Films 8734NA, 8730NA, or 8732NA
- 3M™ Scotch-Weld™ Structural Adhesive Films such as AF163-2 and AF191
- Isopropyl Alcohol
- Lint-free Cloth

## Adhesive Selection Guide

3M™ Cocure Polyurethane Film				
		8734NA	8730NA	8732NA
Cure Temperature	200 °F ↓ 300 °F	AF 163-2U .015 or AF 163-2L .03 or AF 163-3M .03	AF 163-2L .03 or AF 163-3M .03	AF 163-2L .03 or AF 163-3M .03
	300 °F ↓ 400 °F	AF191U .015 or AF191M .03	AF191M .03	AF191M .03

## Equipment

- Autoclave, heated press, vacuum oven, or hot bonder

## Surface Preparation

- Prepare pre-cured composite or metal surface per standard operating procedures for adhesive bonding.
- Cut the 3M™ Cocure Polyurethane Film to size. Cutting the film slightly oversized can assist in layup handling.
- Remove the protective liner from the 3M™ Cocure Polyurethane Film.
- Wipe the 3M™ Cocure Polyurethane Film with a lint free cloth. A minimal amount of isopropyl alcohol can be used if surface contamination is present.

*Note:*

- Before handling any chemical products used for cleaning and installation of the protective film, always read the container label and the Safety Data Sheet (SDS).
- When using solvents, extinguish all ignition sources, including pilot lights. Read and follow manufacturer's warnings and directions for use.
- Local air quality regulations may regulate or prohibit the use of surface preparation and cleaning materials based on solvent (VOC) content.

## Layup Procedure

### Pre-cured Composite or Metal Part (see Figure 1)

- Remove the paper liner from the adhesive and lay the precut adhesive film onto the properly prepared part.
- Prepare a vacuum bag and debulk the adhesive film to the composite part per standard operating procedures.
- Unbag the part, remove the poly liner from the adhesive, and tack the precut 3M™ Cocure Polyurethane Film to the adhesive. Either surface of the 3M™ Cocure

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Polyurethane Film can be applied toward the adhesive. Ensure the protective liners are removed from both the adhesive and the 3M™ Cocure Polyurethane Film. Apply pressure to smooth the polyurethane film so as not to entrap air.

- Apply a silicone rubber caul sheet over the 3M™ Cocure Polyurethane Film and assemble the vacuum bag per standard operating procedures.
- Debulk the assembly after the 3M™ Cocure Polyurethane Film has been placed on the adhesive film for at least 15 minutes or per standard operating procedures.

*Note: Three dimensional caul sheets are recommended for parts having complex curvature in order to prevent low pressure regions and vacuum bag bridging.*

- Cure per adhesive film recommended cure cycle. If using 3M AF163-2L .03, a typical cure cycle would be 250 °F at 45 psi for 60 minutes with a 5 °F per minute ramp rate. If using AF191M .03, a typical cure cycle would be 350 °F at 45 psi for 60 minutes with a 5 °F per minute ramp rate. Refer to the technical datasheets for 3M™ Scotch-Weld™ Structural Adhesive Film AF 163-2 and 3M™ Scotch-Weld™ Structural Adhesive Film AF 191 for alternative cure cycles.

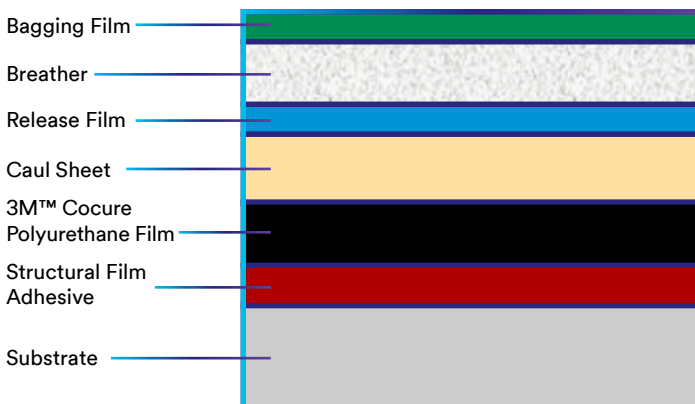


Figure 1

## Co-cured with Composite Prepreg (see Figure 2)

- Prepare layup tool per standard operating procedures. Use of LOCTITE® FREKOTE 700-NC is recommended when curing the 3M™ Cocure Polyurethane Film directly against a tool surface. Refer to the technical datasheet for LOCTITE® FREKOTE 700-NC for the proper application procedure.
- Remove the protective liner from the 3M™ Cocure Polyurethane Film and place it directly against the prepared tool surface.
- Layup composite prepreg and/or core subassembly onto the 3M™ Cocure Polyurethane Film per process specifications. Debulk the part under vacuum for at least 15 minutes or per standard operating procedures.

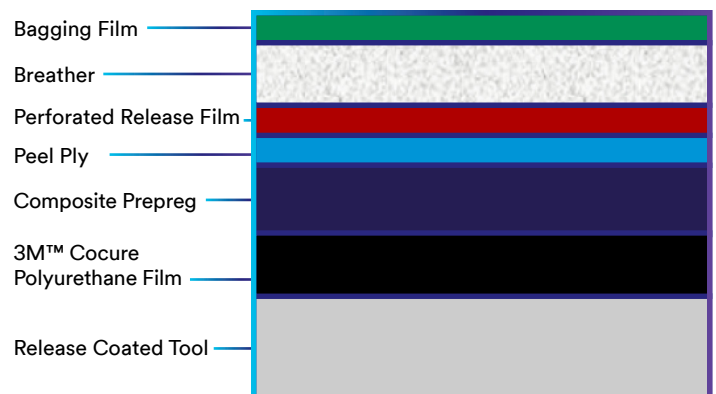


Figure 2

## General Processing Guidelines

	Autoclave/ Vaccum Bag	Compression Molding	Resin Transfer Molding
<b>Temperature</b>	Up to 400°F	Up to 400°F	Up to 400 °F
<b>Ramp Rate</b>	1-10°F/min	1-10°F/min (pre-heated mold)*	1-5 °F/min (pre-heated mold)*
<b>Pressure</b>	14-100 PSI	100-2000 PSI	14 – 80 psi

\*Use of pre-heated mold may require predrying of 3M™ Cocure Polyurethane Film.

*Note: These are general guidelines but processing of 3M™ Cocure Polyurethane Film is not limited to these conditions. Please contact 3M Aerospace technical support for further information related to processing conditions.*

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