

3M

Scotch-Weld™

Structural Adhesive Film

AF 130-2

Technical Data

May, 2002

Introduction

3M™ Scotch-Weld™ Structural Adhesive Film AF 130-2 (asbestos free AF 130) is designed for the bonding of honeycomb to metal and metal applications where high performance properties are needed over the -67 to 400°F (-55 to 204°C) temperature range. Scotch-Weld AF 130-2 can be used with 3M™ Scotch-Weld™ Structural Adhesive Primer EC-2333. See Product Specification Sheet for Scotch-Weld EC-2333.

Product Description

This is not a specification

Color:	Pale Yellow
Base:	Modified Epoxy
Form:	Supported Film
Weight:	17-19 mils .085-.095 (lbs./sq. ft.)
Tack Range:	120-180°F (49-82°C)
Flow Range:	180-250°F (82-121°C)
Min. Cure Temp.:	300°F (149°C)
Min. Cure Time:	1 hour
Volatile Loss on Cure:	Less than 1.25% (350°F [177°C] 1 hour)

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Product Application The Product Performance data reported in the next section were developed using the following suggested procedures. Other conditions are under evaluation.

I. Surface Preparation

A thoroughly cleaned, dry grease-free surface is essential for maximum performance. Cleaning methods which will produce a break-free water film on metal surfaces are generally satisfactory.

1. Vapor Degrease – Hand skins in condensing vapors of perchloroethylene for 5 minutes.
2. Alkaline Degrease – Immerse skins in Oakite No. 164 solution (9-11 oz./gallon water) at 180-200°F (82-93°C) for 10-20 minutes. Rinse in generous quantities of clear running water.
3. Acid Etch* – Place skins in the following solutions for 10 minutes at 150°F ± 5°F (66°C ± 2°C).

(FPL Etch)

Tap Water	Balance
Sulfuric Acid (conc) 66° Be	38.5 - 41.5 oz./gallon
Sodium Dichromate (Na ₂ Cr ₂ O ₇ ·2H ₂ O)	4.1 - 4.9 oz./gallon
2024T3 aluminum (dissolved)	0.2 oz./gallon minimum

4. Rinse – Rinse face sheets in clear running water.
5. Dry – Air dry 15 minutes; force dry 10 minutes with parts at 150°F ± 5°F (66°C ± 2°C).

***CAUTION:** Use adequate respiratory, eye and skin protection when using etch solutions.

II. Adhesive Layup

Care should be taken to avoid contaminating adhesive and cleaned aluminum by any substance which will hinder wetting action of the adhesive.

A. Film Application

1. Cut portion of film to be used from roll with protective liners in place.
2. Remove liner from one side of the film.
3. Place film on metal using a separating liner as a protective cover.
4. Roll film into position with a rubber roller, insuring that no air is trapped between film and panel.
5. Remove second protective liner.
6. Assemble parts and cure. Tack if necessary at 120-180°F (49-82°C).

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Product Application
 (continued)

III. Cure Cycle

A. General

Curing ovens must be vented to the outdoors. The tack, flow and cure initiation temperature for 3M™ Scotch-Weld™ Structural Adhesive Film AF 130-2 is a time-temperature relationship and depends upon the rate of heat input.

Normally, Scotch-Weld AF 130-2 will have the following properties:

Tack Temperature	120-180°F (49-82°C)
Flow Temperature	180-300°F (82-149°C)
Cure Initiation Temperature	300-350°F (149-177°C)

A minimum cure temperature of 350°F (177°C) is recommended to effect a cure in a reasonable length of time. (Approximately 60 minutes). A cure of 60 minutes at 350°F (177°C) and 50 psi pressure is suggested where maximum results are desired.

B. Cure Cycle (Platen Press)

The following cure cycle is recommended to obtain dense glue lines which give the strengths reported in the Product Performance section.

	<u>Cure Cycle</u>
1. Bonding Pressure: Apply before reaching a bonding temperature of 150°F (66°C) and maintain throughout press cure cycle.	45-50 psi
2. Bondline temperature rise rate.	10°F (-12°C)/minute
3. Cure	60 minutes at 350°F (177°C)
4. Temperature at which pressure is released	200°F (93°C) or below

Product Performance

The following product performance data has been obtained in the 3M Laboratory under the conditions specified. General application methods and bonding procedures are described later. All data reported in this section was developed under a cure cycle using 50 psi bonding pressure applied by a press, a 10°F (-12°C)/minute bond time temperature rise from 80°F to 350°F (27°C to 177°C) at 350°F (177°C).

I. Aluminum to Aluminum Overlap Bonds

The following data shows typical values obtained with Scotch-Weld AF 130-2 on aluminum overlap panels. Overlap bonds consist of 1/2" overlap primed or unprimed 0.063" 2024T81 bare aluminum 4" x 7" panels, with one layer of Scotch-Weld AF 130-2 film adhesive. Tests were conducted per MMM-A-132 methods.

Test	Test Temperature	Scotch-Weld AF 130-2 Unprimed
Overlap Shear	75°F (24°C)	2600 psi
	300°F (149°C)	2600 psi
	350°F (177°C)	2200 psi

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Storage

Storage Stability: Storage at $0 \pm 5^{\circ}\text{F}$ is recommended for 3M™ Scotch-Weld™ Structural Adhesive Film AF 130-2 to obtain maximum storage life.

CAUTION: Scotch-Weld AF 130-2 film should be permitted to thoroughly warm to room temperature before being used in order to prevent moisture condensation. Avoid inhalation of, or eye contact with dust from grinding and sawing of the cured material.

Precautionary Information

Refer to Product Label and Material Safety Data Sheet for health and safety information before using this product. For additional health and safety information, call 1-800-364-3577 or (651) 737-6501.

For Additional Information

For additional information call 1-800-235-2376. For Technical Service assistance, call (651) 736-5954. Address correspondence to 3M Aerospace Lab, Technical Service, 3M Center, Building 209-2S-32, St. Paul, MN 55144-1000.

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ISO 9002

This Engineered Adhesives Division product was manufactured under a 3M quality system registered to ISO 9002 standards.

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