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Introductory Technical datasheet Core splice Film Scotch-Weld™ AF 3070 FST

Introduction

Scotch-Weld™ Core Splice Adhesive Film AF 3070 FST is a dual cure 120°C or 180°C curing, low density, expandable product for the purpose of sandwich edge finishing, filling mismatched areas, core splicing and reinforcing honeycomb core. AF 3070 FST fulfils stand alone fire, smoke and toxic gas emission (FST) requirements according to FAR 25.853 or ABD 0031 and is obtained with a completely halogene free FST system.

Description

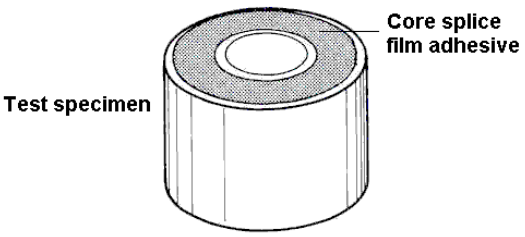
Color : Light red brown
Base : Modified epoxy
Form : Unsupported film
Normal caliper : 1.27 ± 0.13 mm (50 mil)
2.54 ± 0.25 mm (100 mil)

Suggested cure cycle : 120°C for 60 minutes with a heat up rate between 2°C to 6°C/min.
Typical expansion ranges :
For 120°C cure : 50 – 75 %

Performance *This is not a specification*

1. Tube shear strength :

The tube shear strength has been determined on AF 3070 FST using the procedures outlined in EN 2667-2. Tube shear specimens are prepared by placing 55 ± 0.2 grams of AF 3070 FST between the walls of two 228 mm long tubes.



Outer and inner tubes : 228 long aluminium alloy 5052-0 bare tubes
Outer tube has an outer diameter of 25.0 mm and a thickness of 1.25 mm.
Inner tube has a outer diameter of 12.5 mm and a thickness of 1.25 mm

Tube Shear resistance is calculated by the following formula : $\sigma\ [MPa] = \frac{F}{p d_{inner} h}$

Condition	Test temperature	Performance
Initial	-55°C	11.3 MPa
Initial	+23°C	7.1 MPa
Initial	+80°C	4.8 MPa
Dry heat at +80°C, 1000h	+80°C	5.1 MPa
Demineralized water at +23°C, 1000h	+23°C	4.8 MPa
Jet fuel F35 at +23°C, 1000h	+23°C	5.9 MPa
Tri-N-Butyl Phosphate at +23°C, 1000h	+23°C	5.4 MPa
Lubrification oil O-160 at +23°C, 1000h	+23°C	5.5 MPa

Cure cycle : 125°C for 60 minutes with a 3.0°C/min. heat up rate, atmospheric pressure.

2. Fire, smoke and toxicity properties :

When tested in accordance with the test procedures described in the Airbus Directives, ABD 0031 the following passing results (typical averages) were obtained on specimens cured for 60 minutes at 125°C :

A) Flammability (vertical mode)

Test properties	ABD 0031 requirement	AF3070FST performance
Self extinguishing time (s)	15 max	< 3 seconds
Flame time of drips (s)	3 max	no drips
Burn length (mm)	152 max	< 50 mm

B) Smoke density (Flaming mode, 4 minutes)

Test property	ABD 0031 requirement	AF3070FST performance
Optical smoke density (D_s).	200 max	125 - 175

C) Toxic gas emission (gas concentration)

Test property	ABD 0031 requirement	AF3070FST performance
CO (ppm)	1000 max	260
HCN (ppm)	150 max	5
HF(ppm)	100 max	< 1
HCl (ppm)	150 max	7
SO_2 (ppm)	100 max	1
NO_x (ppm)	100 max	< 1

Application

- **Surface preparation**

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

A. Aluminium skins (3M company optimized FPL etch, 3M Test method C-2803)

1.) Degreasing with Methyl Ether Ketone
2.) 10 to 20 minutes immersion of alkaline degreasing 8% Oakite 164 solution at 85 ± 5°C
3.) Rinsing in tap water
4.) Sulfochormic immersion (10 minutes) at 70 ± 2°C
    27.5% by weight of H_2SO_4
    7.5% by weight of $Na_2Cr_2O_7$-$2H_2O$
    65.0% by weight of demineralized water
    0.5 g/litre aluminium
    1.5 g/litre of $CuSO_4$-$5H_2O$
5.) Rinsing in tap water
6.) 15 minutes drying at 23 ± 2°C
7.) 10 minutes drying at 70 ± 2°C

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

B. Aluminium Honeycomb core

1.) Soak in clean aliphatic naphtha* (to conform to TT-N-95A) for five minutes at room temperature.
2.) Dry 10 minutes at 65 ± 5°C

Optional :

1.) Immerse in etching solution for two minutes at 10 ± 2°C.
2.) Rinsing in tap water
3.) Air dry or force dry in similar manner to skin panels.

When using solvents, it is essential that proper precautionary measures to handling such materials be observed.

Application continued

- **Film**

Care should be taken to avoid contaminating adhesive and cleaned or primed aluminium by any substance that will hinder wetting action of the adhesive.

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 or edge of honeycomb core using the remaining liner as a protective cover.
4.) On metal surfaces, roll film into position with a rubber roller to insure that no air is trapped between the film and metal.
5.) Remove second protective liner.
6.) Assemble parts and cure.

Storage stability

Storage at -18°C or below is suggested for AF 3070 FST to obtain maximum shelf life.

Care must be taken when handling AF 3070 FST at low temperatures because it can easily crack. Warm AF 3070 FST to ambient conditions in the sealed package to prevent moisture condensation on the adhesive surface.

Precautionary Information

Warning, AF 3070 FST contains epoxy resin. May cause skin irritation. May cause a sensitization reaction in certain individuals.

Precautions : Avoid skin contact. Avoid inhalation or eye contact with dust from grinding operations on cured material. Curing ovens must be vented to the outdoors.

Suggested first aid :

Eye contact : Flush eyes with plenty of water. If irritation persists, call a physician.
Skin contact : Wash with soap and water.

See Material Safety Data Sheet for precautionary information.

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3M Reference

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