3M™ Scotch-Weld™ Structural Adhesive Primer EC-3910

Technical Data Sheet

Introduction

3M™ Scotch-Weld™ Structural Adhesive Primer EC-3910 is a solvent-based modified epoxy primer, that contains non-chromated corrosion inhibitive pigments. Priming with EC-3910 offers the following advantages:

- Sprayable with conventional spray equipment
- Complete wetting of the adhesive to the adherends
- Protects cleaned, etched, and anodized surfaces until ready for adhesive bonding
- Operational temperature range from -55 °C to 120 °C

Typical Uncured Product Characteristics

NOTE: All technical data and information in this data sheet should be considered representative or typical only and should not be used for specification purposes.

General Properties	
Colour	Blue-green
Base	Epoxy
Vehicle	Mixture of solvents
Density	0.89 g/cm³
Solid content	11.9 wt.% ± 1.0 wt.%

Typical Cured Product Performance

NOTE: All technical data and information in this data sheet should be considered representative or typical only and should not be used for specification purposes.

I) Substrates: Bare aluminium 2024 T3
Adhesive film: 3M™ Scotch-Weld™ Structural Adhesive Film AF 163-2 K.06 (AF 163-2)
Test methods: Single lap shear ASTM D-1002 (SLS) and floating roller peel strength ASTM D-3167 (FRP)
Crosshead speed: 1.27 mm/min for SLS and 152.4 mm/min for FRP
Primer cure: Minimum 30 minutes at ambient temperature, followed by 60 – 70 minutes at 121 °C
Primer thickness: 2.5 to 6.4 µm
Surface treatment: FPL etch + phosphoric acid anodization (PAA)
Adhesive film cure: 121 °C ± 3 °C for 60 to 70 minutes at 2.4 bar ± 0.4 bar; heat-up rate (2 - 3) °C/min

Test	Adhesive film	Surface preparation	Test temp.	Unit	Result [1)]
SLS	AF 163-2	FPL + PAA	-55 °C	MPa	49
SLS	AF 163-2	FPL + PAA	23 °C	MPa	40
SLS	AF 163-2	FPL + PAA	90 °C	MPa	24
FRP	AF 163-2	FPL + PAA	-55 °C	N / 25 mm	205
FRP	AF 163-2	FPL + PAA	23 °C	N / 25 mm	258
FRP	AF 163-2	FPL + PAA	90 °C	N / 25 mm	326

[1)] Typical average from at least 6 specimen

II) Substrates: Clad aluminium 2024 T3
Adhesive films: 3M™ Scotch-Weld™ Structural Adhesive Film AF 163-2 K.06 (AF 163-2), Syensqo FM® 73 M.06 (FM® 73)
Test methods: Single lap shear EN2243-1 (SLS) and floating roller peel strength EN2243-2 (FRP)
Crosshead speed: 2 mm/min for SLS and 100 mm/min for FRP
Primer cure: 10 to 30 minutes at ambient temperature, followed by 60 minutes at 120 °C, heat-up rate 3 °C/min
Primer thickness: 3 to 5 µm
Surface treatment: Sulfuric nitric ferric acid etching (SNF) + phosphoric sulfuric acid anodization (PSA)
Adhesive film cure: 125 °C for 75 minutes at 3 bar autoclave pressure; heat-up rate 3 °C/min

Test	Adhesive film	Surface preparation	Test temp.	Unit	Result [1)]
SLS	AF 163-2	SNF + PSA	-55 °C	MPa	43
SLS	AF 163-2	SNF + PSA	23 °C	MPa	41
SLS	AF 163-2	SNF + PSA	80 °C	MPa	31
SLS	AF 163-2	SNF + PSA	90 °C	MPa	27
SLS	FM® 73	SNF + PSA	-55 °C	MPa	44
SLS	FM® 73	SNF + PSA	23 °C	MPa	39
SLS	FM® 73	SNF + PSA	80 °C	MPa	27
SLS	FM® 73	SNF + PSA	90 °C	MPa	24
FRP	FM® 73	SNF + PSA	-55 °C	N / 25 mm	207
FRP	FM® 73	SNF + PSA	23 °C	N / 25 mm	338
FRP	FM® 73	SNF + PSA	80 °C	N / 25 mm	292
FRP	FM® 73	SNF + PSA	90 °C	N / 25 mm	247

[1)] Typical average from at least 6 specimens

Handling

Refer to product label and Safety Data Sheet (SDS) for health and safety information before using this product. For SDS in local languages visit www.3m.com/sds.

Product Application

NOTE: This information is provided as a general application guideline based upon typical conditions. No two applications are identical due to differing assemblies, method of heat and pressure application, production equipment and other limitations. It is therefore suggested that experiments be run, within the actual constraints imposed, to determine optimum conditions for your specific application and to determine suitability of product for any given intended use.

Before use or any re-filling operation, 3M™ Scotch-Weld™ Structural Adhesive Primer EC-3910 must be warmed up to ambient temperature and homogenized.

Homogenization

3M™ Scotch-Weld™ Structural Adhesive Primer EC-3910 contains finely dispersed solids, which tend to settle at the bottom of the container during storage. An appropriate mixing method has to be applied, in order to fully re-disperse the solids. This can be achieved by using a paint can shaker or a roller mixer. Mixing parameters should be evaluated before use and adjusted based on container size and the chosen mixing method (paint shaker or roller).
During usage, agitation of the primer should be maintained in the spray system. If a spray gun with a mounted paint cup is used, visual control of the primer before starting the spray operation and after each break is recommended. Settled solids can be re-dispersed by gentle movements of the spray gun.

Surface Preparation

A thoroughly cleaned, dry, and grease-free surface is essential for maximum performance. Results on aluminium shown in this data sheet were generated using solvent cleaning and alkaline degreasing followed by a combination of etching and anodization processes (FPL/PAA or SNF/PSA).

Primed aluminium panels can be stored up to 3 months before bonding, when keeping away dust and other contaminants from the treated surface.

Spray Procedure

3M™ Scotch-Weld™ Structural Adhesive Primer EC-3910 can be applied with conventional paint spray guns. A needle size between 1.2 and 1.4 mm is recommended in combination with a HVLP type spray gun. Adjust spray parameters in a way that a uniform film without particles or droplets is formed. A good spraying distance is around 25 cm.

The spray result can vary with temperature and humidity conditions. To assure a good appearance of the primer film, the booth temperature should be above 21 °C, the humidity below or close to 50 %. At high humidity and low temperature conditions spray less material with each pass. Allow flash-off between passes.

The recommended primer thickness is 3 to 5 µm. Note that certain applications or specifications might require a thickness outside of this range.

Suggested Cure Cycle

Drying time: 30 minutes at 23 °C ± 3 °C
Curing time and temperature: 60 minutes at 120 °C ± 5 °C, with a heat-up rate of 3 °C / min.

Storage Life and Storage Conditions

Standard storage life of 3M™ Scotch-Weld™ Structural Adhesive Primer EC-3910 is 24 months from the date of manufacturing when stored at -18 °C or below in the original unopened container. A shorter storage life might be defined in customer specifications and would supersede the 3M Standard Storage Life. The suggested maximum out-time of Scotch-Weld™ EC-3910 is 30 days when stored at a maximum of 23 °C or 15 days at a maximum of 30 °C. Please see customer specifications for additional storage and out-time conditions, if applicable.

Authorization to Use
Ensure products meet all applicable specifications, standards, and maintenance manual requirements for the platform being worked on and validate all aircraft approvals against current technical documentation.

These products are manufactured under a 3M Quality Management System registered to the AS9100 standard.

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