

3M Science.
Applied to Life.™



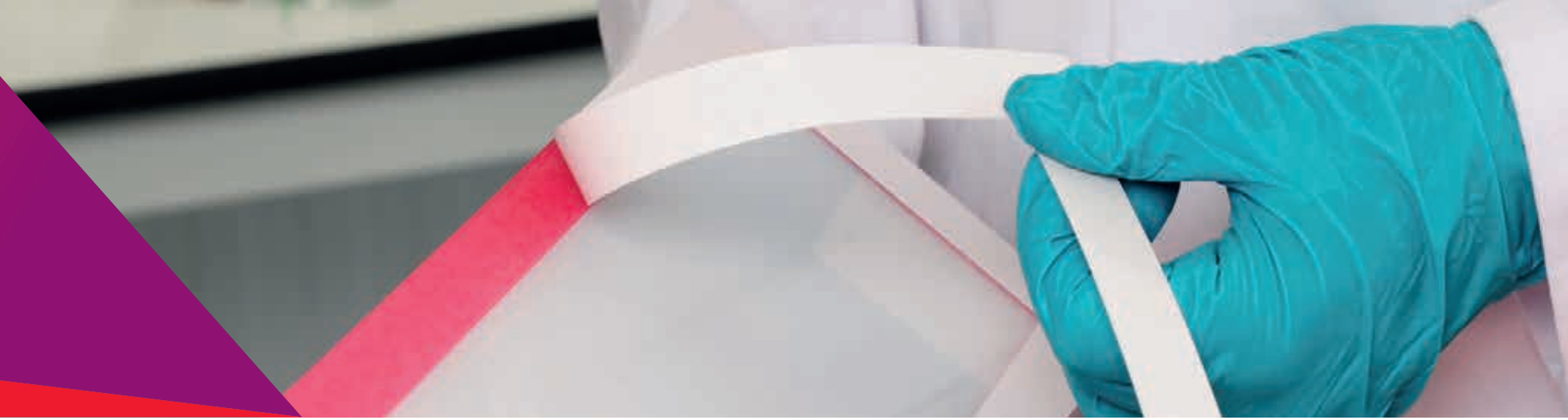
Ensure a secure bond

Structural Epoxy and Nitrile Phenolic Adhesive
Films, Core Splice Films and the associated
Structural Adhesive Bonding Primers.

Structural Adhesive Films

3M have a wide range of adhesive film solutions for the aerospace industry, available in a variety of film thicknesses.

Our products are used to structurally bond a wide range of metal and composite substrates, either by co-curing or co bonding.



Structural Epoxy Adhesive Films

3M™ Scotch-Weld™ Structural Epoxy Adhesive Films are thermosetting and designed for various different structural bonding applications. Depending on product choice, they will provide medium to high temperature resistance with typical cure cycles from 120°C to 180°C.

3M epoxy adhesive films are utilised in aircraft maintenance and to ensure production efficiency. Specially designed for metal bonding, metal to composite bonding, structural bonding and surfacing, these heat-curing, easy handling films are designed to meet numerous customer specs in aerospace manufacturing.

Product name	Available forms	Optimal cure temp. (°C)	Optimal cure dwell (minutes)	Glass transition temp. (°C)		Overlap shear (MPa)				Floating roller peel (N/25mm)			Metal-metal climbing drum peel (mN/m) [†]	Metal-honeycomb climbing drum peel (mN/m) [†]	Metal-honeycomb flatwise tensile (MPa) [†]	Tensile strength (MPa) [†]	T-peel strength (N/25mm) [†]	Properties
				Dry	Wet	-55°C	24°C	82°C	150°C	-55°C	24°C	82°C						
AF 126-2	<ul style="list-style-type: none"> ▶ Matte ▶ Non-woven scrim-supported 	120	60	*	*	33.8	39.3	10.3	*	245	289	267	400.9	*	*	35.8	178	<ul style="list-style-type: none"> ▶ Adhesive can be cured from 80°C up to 175°C ▶ High-tack for shop handling performance ▶ Moderate peel strength
AF 163-2	<ul style="list-style-type: none"> ▶ Fiberglass scrim ▶ Knitted ▶ Matte, lightweight non-woven supported ▶ Matte, non-woven scrim-supported ▶ Matte, one-side tacky, non-woven ▶ Unsupported 	120	90	108	82	42.7	40	26.2	*	347	347	338	356.3	34.2	6.4	48	200.4	<ul style="list-style-type: none"> ▶ Adhesive can be cured from 80°C up to 150°C ▶ High fracture toughness and peel strength ▶ Excellent shop handling characteristics ▶ Excellent pre-bond humidity performance on composite structures
AF 3109-2	<ul style="list-style-type: none"> ▶ Knitted ▶ Unsupported 	120/ 175	60	*	*	37.9	40	23.4	11	*	218	*	*	70.7	7.6	59.6	*	<ul style="list-style-type: none"> ▶ Adhesive can be cured from 120°C up to 175°C ▶ Excellent shop handling characteristics ▶ Excellent pre-bond humidity performance on composite structures ▶ High-fracture toughness and peel strength
AF 191	<ul style="list-style-type: none"> ▶ Knitted ▶ Matte ▶ Unsupported 	175	60	226	218	32.4	37.2	22.1	19.3	67	178	*	191.5	63.8	9.7	*	*	<ul style="list-style-type: none"> ▶ Adhesive can be cured from 135°C up to 175°C ▶ Excellent elevated temperature performance ▶ Excellent cryogenic performance
AF 555	<ul style="list-style-type: none"> ▶ Knitted ▶ Lightning strike ▶ Matte ▶ Unsupported 	175	60	151	137	33	40	30	16	*	*	*	*	*	7.3	*	*	<ul style="list-style-type: none"> ▶ Adhesive can be cured from 135°C up to 175°C ▶ Good pre-bond humidity performance on composite substrates ▶ One year out time at ambient conditions ▶ High-fracture toughness ▶ Excellent shop handling characteristics

[†]At room temperature (approx. 23–24°C)
For more information on the testing conditions please see our technical data sheets available online.

*Data not available in standard technical data set. For more information contact your local 3M representative.



Structural Nitrile Phenolic Adhesive Films



3M™ Scotch-Weld™ Structural Nitrile Phenolic Adhesive Films are designed for metal and structural bonding and surface protection. They can outperform liquid epoxies at high temperatures and provide greater strength retention after aging in many environmental conditions. Protected by a suitable liner for ease of application, the films can help save you time, money and the inconvenience of managing liquid adhesives.

Product name	Colour	Optimal cure temp. (°C)	Optimal cure dwell (minutes)	Overlap shear (MPa)				Floating roller peel (N/25mm)†	Tensile shear (MPa)†	T-peel strength (N/25mm)	Capabilities
				-55°C	24°C	82°C	150°C				
AF 6	Yellow	175	60	*	26.2	11.7	6.9	*	23.4	267	<ul style="list-style-type: none"> Good flexibility and shear strength at service temperatures from -55°C to 82°C
AF 10	Yellow	175	60	*	26.2	11.7	6.9	45	24.1	267	<ul style="list-style-type: none"> Easy application in a dry film which can be pressure, heat or solvent tacked into position
AF 13	Yellow	175	60	*	26.2	11.7	6.9	*	19.3	156	<ul style="list-style-type: none"> Excellent retention of strength after aging in many environments
AF 15	Tan	175	60	24.4	23.5	19	15	20	*	*	<ul style="list-style-type: none"> Offers maximum performance in elevated temperatures, retaining good flexibility and strength Similar in composition to 3M™ Scotch-Weld™ Bonding Film AF 31
AF 30	Light brown	175	60	15.8	30.3	17.9	11.7	35	29.1	165	<ul style="list-style-type: none"> High peel and shear strength Retains strength after aging in many environments Offers adhesion to most metals Extremely low flow Can be pressure, heat or solvent tacked into position
AF 31	Yellow/brown	175	60	19	30.5	*	17.6	20	42.5	*	<ul style="list-style-type: none"> Good flexibility and shear strength at service temperatures from -55°C to 260°C Easy application in a film form which can be pressure, heat or solvent tacked in position Excellent retention of strength after aging in many environments
AF 32	Yellow/brown	175	60	35	26.4	15.8	6.7	55	28.1	267	<ul style="list-style-type: none"> Exceptionally high peel strength Good flexibility and shear strength at service temperatures from -55°C to 260°C Low tack, dry film. Easy application in a film form which can be pressure, heat or solvent tacked in position Excellent retention of strength after aging in many environments Extremely low flow

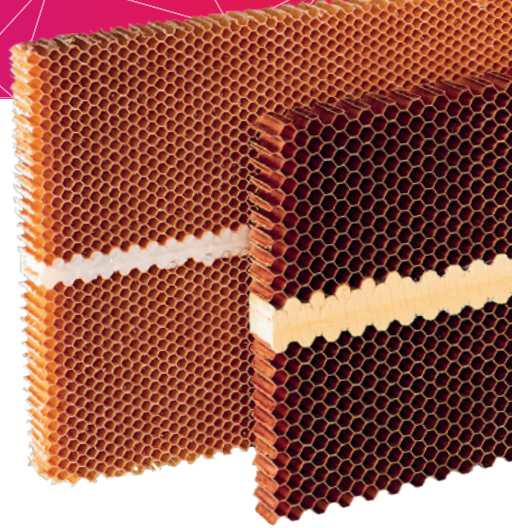
For more information on the testing conditions please see our technical data sheets available online.

†At room temperature (approx. 23–24°C)

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Structural Adhesive Core Splice Films

3M™ Scotch-Weld™ Core Splice Adhesives are heat curing, low density, expandable films designed to fill mismatched areas, splice and reinforce a honeycomb core.



Product name	Colour	Cure temp. (°C)	Tube shear strength (MPa) [†] cured at 125°C				Flatwise tensile strength (MPa)
			-55°C	24°C	82°C	121°C	24°C
AF 3024	Off-white	121/176	10	9.9	10.7	4.8	6.5
AF 3070 FST	Light red/brown	125/175	11.3	7.1	4.8	*	*
AF 3090	Black	120/180	10.1	11.1	6.6	*	8.5
AF 3014	Beige	120/180	8.8	7.7	9.5	*	*

For more information on the testing conditions please see our technical data sheets available online.

[†]At room temperature (approx. 23–24°C)

*Data not available in standard technical data set. For more information contact your local 3M representative.

3M™ Scotch-Weld™ Structural Core Splice Film AF 3024

A low density, thermally expanding film designed for filling mismatched areas or reinforcing and splicing honeycomb core.

- ▶ Excellent gap filling capability due to 150% expansion rate
- ▶ Low sag formula helps eliminate rework
- ▶ Versatile performance and application allows for consolidation of inventory

3M™ Scotch-Weld™ Structural Core Splice Film AF 3070 FST

An epoxy based, dual cure, expandable adhesive film for filling mismatched areas, core splicing, sandwich edge finishing and reinforcing honeycomb core.

- ▶ Completely halogen free FST system
- ▶ Low density product
- ▶ An expansion range of 50–75% for a 120°C cure

3M™ Scotch-Weld™ Structural Core Splice Film AF 3090

A thermally expanding structural adhesive film. Designed for metal-to-metal and composite bonding applications, the filling of mismatched bond surfaces, core-splicing, and reinforcing honeycomb structures.

- ▶ Resistant to cracking and fracturing
- ▶ Exceptional impact and peel strength
- ▶ Conformable and extremely durable
- ▶ Capable of low pressure bonding
- ▶ Expands up to 120% during cure

3M™ Scotch-Weld™ Structural Core Splice Film AF 3014

A thermally expanding structural adhesive film. Designed for filling mismatch areas or reinforcing and splicing honeycomb core.

- ▶ High expansion (150 to 230%)
- ▶ Extended shelf life at room temperature
- ▶ Non-refrigerated transport
- ▶ Easy liner removal



Structural Adhesive Bonding Primers

3M™ Scotch-Weld™ Structural Adhesive Bonding Primers help prepare surfaces for bonding; improving conditions so the adhesives are more effective and create stronger, longer lasting bonds.

All primers can be sprayed, brushed or applied by a roller. The sprayable composition promotes high transfer efficiency for reduced overspray waste.

Epoxy based

These heat curing, epoxy based primers are compatible with our Structural Epoxy Adhesive Films. They offer superior corrosion resistance and the wettability of the adhesive, which in turn enhances the durability of the chemical resistance.

Primer	Colour	Composition	Density (gram per litre)	VOC (gram per litre)	Solid content (% by weight)	Attributes
EC 3924B	Yellow	Solvent based, chromated	0.89	826	<5%	<ul style="list-style-type: none"> Prevents the onset of corrosion Impressive hot/wet durability Protects etched and anodized substrates for long term storage Provides robust mechanical performance when used with 170°C curable Scotch-Weld Structural Adhesive Films
EC 3917	Yellow/green	Solvent based, chromated	0.86	752	5–15%	<ul style="list-style-type: none"> Ensures complete wetting of the film adhesive system to bonding surfaces Protects etched and anodised substrates for long term storage Can be co-cured with adhesives at 120–170°C Impressive hot/wet durability
EW 5000	Yellow	Water based, non-chromated	1.06	178	31%	<ul style="list-style-type: none"> Excellent corrosion protection Low VOC (178 g/L) Can be sprayed to target thickness, 5–6 µ within one box coat 3-6 times higher coverage compared to solvent-borne primers Ensures complete wetting of the film adhesive system to bonding surfaces Handleable prior to the bake cycle Hot/wet durability
EW 5000AS	Green	Water based, non-chromated	1.06	244.2	36.5%	<ul style="list-style-type: none"> Excellent corrosion protection Low VOC (less than 250g/L) Delivers comparable performance to solvent based products, offers more choice in respective processes Ensures complete wetting of the adhesive to the surface Handleable prior to the bake cycle Serves 170°C co-cure requirements Impressive hot/wet durability

For more information on the testing conditions please see our technical data sheets available online.

Nitrile Phenolic based

This range of primers are compatible with our Structural Nitrile Phenolic Adhesive Films. All solvent based, they provide a high degree of protection against corrosive environments and promote the long-term durability in bonded joints.



Primer	Colour	Composition	Density (gram per litre)	VOC (gram per litre)	Solid content (% by weight)	Attributes
EC 2174	Tan	Solvent based	0.81	744	5–15%	<ul style="list-style-type: none"> Provides a solvent resistant coating when cured at 120°C Can be co-cured with adhesives at 170°C Stable coating protects etched and anodized substrates for long term storage Dries at ambient temperatures
EC 1290	Light amber	Solvent based	0.86	777	10%	<ul style="list-style-type: none"> Ensures complete wetting of film adhesive to the bonding surfaces Improves adhesion at elevated temperatures Impressive hot/wet durability Protects etched and anodized substrate for long term storage Dries at ambient temperatures
EC 1660	Green	Solvent based	0.84	797	<5%	<ul style="list-style-type: none"> Can be co-cured with adhesives at 170°C Ensures complete wetting of film adhesive to adhered surfaces Impressive hot/wet durability
EC 1593	Blue/green	Solvent based	0.89	791	22%	<ul style="list-style-type: none"> Can be co-cured with adhesives at 170°C Robust mechanical performance Stable coating protects etched and anodized substrates for long term storage Impressive hot/wet durability Good overlap shear strengths on aluminum and magnesium from -55°C to 82°C

For more information on the testing conditions please see our technical data sheets available online.

Adhesive promoter

3M™ Scotch-Weld™ Structural Adhesive Primer EC 2333

Formulated for improved adhesion and to promote long-term durability for joints in metal bonding applications. It protects cleaned surfaces until the bonding operations can be completed and can be co-cured with adhesives at 170°C. Can be cured at room temperature, therefore effective for maintenance and repair operations.

- Non-chromated
- Excellent corrosion protection
- Yellow

Density (gram per litre)	VOC (gram per litre)	Solid content (% by weight)
0.88	857	9-20%

Adhesive surface pre-treatment

3M™ Surface Pre-treatment AC 130-2

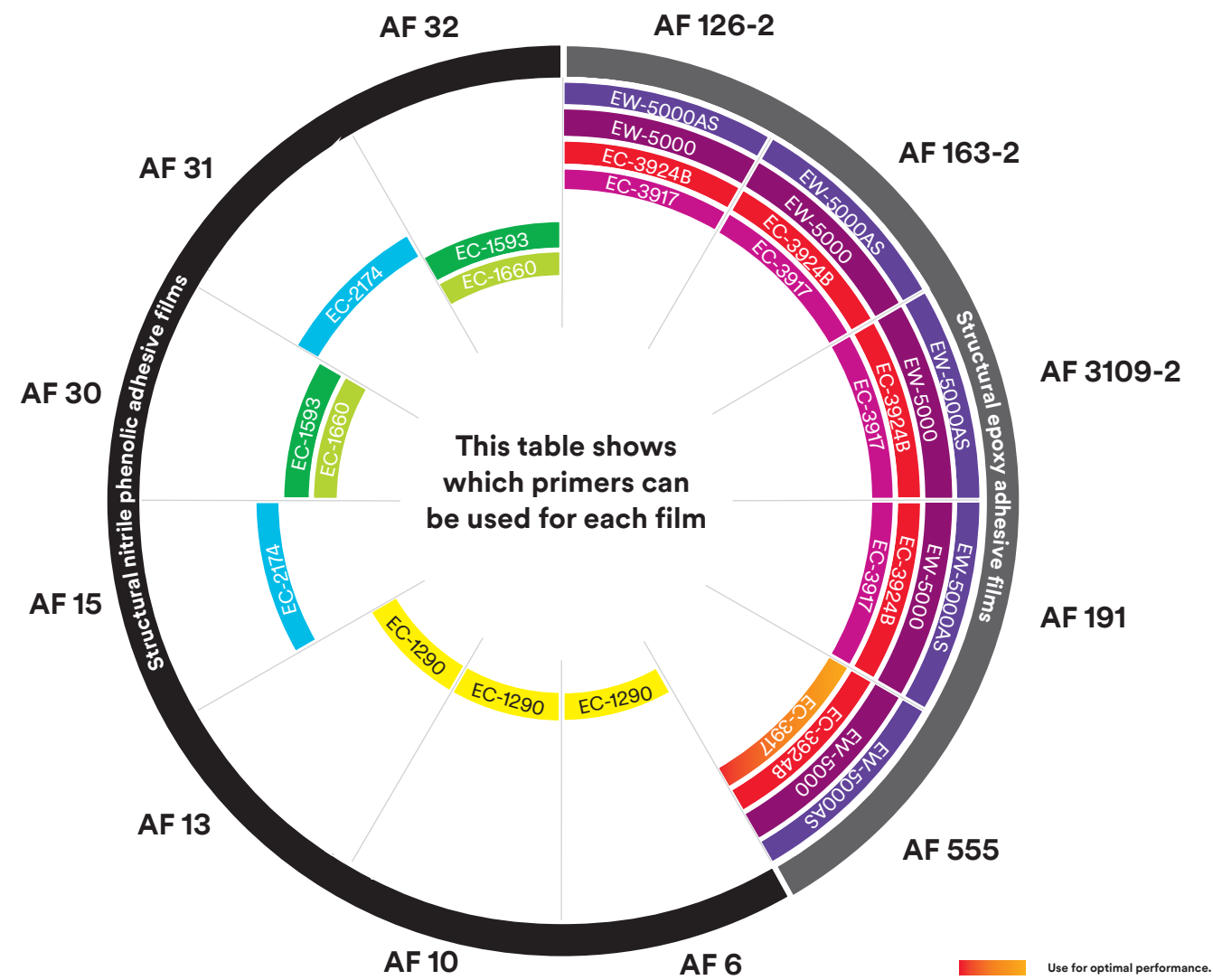
A high performance surface preparation for adhesive bonding, designed to promote enhanced adhesion of substrates. It can be cured at room temperature, therefore is predominantly used for repairs.

- Provides an economical and environmentally superior alternative to more costly and hazardous processes
- Clear



Primers and Films compatibility table

In general, 3M Scotch-Weld™ Structural Adhesive Primers complement the Scotch-Weld structural adhesives portfolio.





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