

**3M** Science.  
Applied to Life.™



# 3M™ Structural Adhesives

## SA9820 (Orange) and SA9820 (Black)

2K structural adhesive formulated for increased design flexibility and lightweighting.

# Better science for better adhesion from 3M.

Since 1925 when one of our lab assistants invented masking tape, 3M has been applying science to life – developing adhesive products and technologies that help entire industries and individual businesses worldwide. The work that began with a single 3M engineer now spans decades and generations – and all of it goes into each of our products developed for automotive OEMs, like 3M™ Structural Adhesive 9820.



## 3M™ Structural Adhesives SA9820 and SA9820B

SA9820 and SA9820B are highly toughened two-part epoxy adhesives formulated for increased design flexibility in OEM automotive applications. The adhesives allow for bonded substructures to be stored for up to two months before full E-coat/paint cycle curing. They are excellent for bonding carbon composites and multi-material structures as they also cure at low temperature.

SA9820B offers the same technical performance as the standard orange version, yet the black colour of the adhesive will guarantee a better visual appearance on CFRP substrates, with no visual defects of the bond line.

Product features	Performance advantages	Customer benefits
Epoxy chemistry	<ul style="list-style-type: none"> <li>▶ High bond strength with cohesive failure mode on aluminium substrates as well as composite materials</li> <li>▶ Compatible with wet and dry lubes</li> <li>▶ Excellent long-term durability (to heat, humidity, salt water)</li> </ul>	<ul style="list-style-type: none"> <li>▶ Robust, structural bonding performance</li> <li>▶ Provides good bond strength under various process conditions</li> </ul>
Two-part	<ul style="list-style-type: none"> <li>▶ Extended shelf-life</li> <li>▶ Controlled reactivity; balance of longer open time and proper lock-up e.g. after induction</li> <li>▶ Room temperature strength build-up</li> <li>▶ Can be dispensed with commercially available dispensing systems; off-ratio tolerance</li> <li>▶ Wash out resistance in E-Coat</li> </ul>	<ul style="list-style-type: none"> <li>▶ Broad handling and dispensing windows</li> </ul>
Flexible curing	<ul style="list-style-type: none"> <li>▶ Low temperature activation 80°C to 115°C depending on cycle time</li> <li>▶ Reduced potential for panel distortion and increased options for multi-material bonding</li> <li>▶ Induction cured in seconds</li> </ul>	<ul style="list-style-type: none"> <li>▶ Broad curing windows; faster cycle times</li> </ul>



Physical properties	Part A	Part B	Mixed adhesive
<b>Colour</b>			
SA9820	Red	Yellow	Orange
SA9820B	Red	Black	Black
% solids	100%	100%	100%
Density ( $\pm 0.06$ )	1.07g/cc	1.07g/cc	
Viscosity at RT [Pas] ( $\pm 20$ )	70	260	

### A two-part structural adhesive for greater design flexibility

3M™ Structural Adhesives SA9820 and SA9820B have a wide process window and can be applied under normal body-in-white (BIW) conditions at OEMs or in Tier-1 companies for modular assemblies and later fitting in BIW.

The adhesives afford the bond strength of a one-part adhesive and exceeds the strength, stiffness and crash performance of premium two-part structural adhesives.

It can be induction cured at room temperature for fast geometric joint lock up. It can also be cured conventionally at bake temperatures as low as 80°C.

The adhesive features controlled reactivity for a longer work time (approx. 1 hour) and proper panel lock-up after induction heating for accelerated curing.

### Multi material bonding



CFRP to aluminium



CFRP to CFRP



Aluminium to magnesium

## Fatigue testing

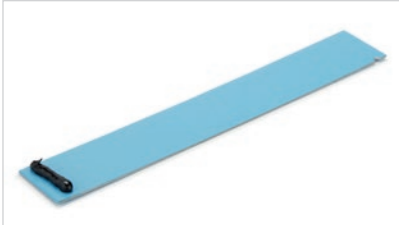
Overlap shear test joints (etched 2024T3 aluminium) were fatigued using a 1kN cyclic load. The samples were exposed to 50°C/95% RH during the whole of the test.

Fatigue testing in hot/wet conditions is a key discriminator of both adhesive and mechanical performance.

The test was conducted to 10 million cycles and then stopped. All the test joints survived the 10 million cycles and were then tested to destruction.

Fatigue cycles (test stopped)	Substrate	Adhesive	Shear stress MPa (tested after fatigue)	Failure mode
10,202,766 fatigue cycles 50°C/95% RH	2024T3	SA9820	27.21	Cohesion
10,202,775 fatigue cycles 50°C/95% RH	CFRP	SA9820B	26.93	Cohesion

If you would like to speak to a 3M expert, please get in touch on 0330 053 8940.



Magnesium

Aluminium

CFRP

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