Structural Adhesive Film SAF6068

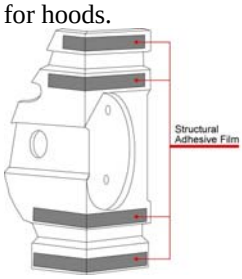
Technical Data Sheet **January 2013**

Supersedes Technical Data Sheet dated April 2009

General Description

3M™ Structural Adhesive Film SAF6068 is used for structural bonding or stiffening of metal-to-metal joints in Body-in-White (BIW) applications. The product is designed for use in bonding to oily surfaces. It can be used directly from the roll or die-cut to the shape required for the application.

Some typical applications include hinge-washer bonding, hinge and pillar reinforcement brackets, roof bow brackets and stiffening pads for hoods.



The product exhibits some expansion during typical E-coat bake cycles to maximize joint fill and builds up final structural strength during the paint bake cycle.

Storage and Handling

Storage and shelf life are temperature dependent, and the supply chain must be familiar with required conditions to avoid excessive temperature excursions of adhesive-coated parts (see information below).

Where parts are stacked together without a release liner, care must be taken that the adhesive does not contact opposing surfaces. The product is currently being used successfully on parts shipped and stacked together in boxes.

Pre-Application Adhesive Shelf Life:

Freezer storage	-18°C/0°F	6 months
Refrigerator	+4°C/39°F	30 days
Typical room temperature	+24°C/75°F	14 days
Max. transportation temperature of adhesive-coated parts	+30°C/86°F	

Storage at the Convertor:
Rolls of 3M Structural Adhesive Film SAF6068 should be stored at -18°C/0°F in their original, unopened containers. Before converting or application to metal parts, 3M Structural Adhesive Film SAF6068 should be allowed to thoroughly warm to room temperature (+24°C/75°F) to prevent moisture condensation on the adhesive surface or cracking during handling. Do not open protective container prior to reaching ambient condition.

Storage of Adhesive-Coated Parts:
Adhesive-coated parts should be delivered to the OEM customer ensuring that they are used (baked) within 30 days from exposure to room temperature (max +24°C/75°F) until processed at the OEM.

Parts should be used in proper sequence after delivery to ensure minimum storage time for each part. The performance of the adhesive should be established for each application in relation to the maximum likely storage time/temperature of the part.

Care should be taken that transportation conditions do not exceed 30°C/86°F as a guideline – because the adhesive has a low cure rate even at room temperature and may reduce tack and performance in storage.

Storage and Handling (continued)

Labeling:
It is recommended parts that have an expired shelf life are not assembled. A "USE BEFORE" label should be applied to parts shipped to the OEM plant.

Product Features

- Modified epoxy chemistry
- High shear and peel strength
- Robust structural bonding performance
- E-coat and paint compatible in current applications
- Robust processing performance
- Good environmental durability to OEM specifications
- Dependable performance under extreme operating conditions
- Low emissions, vapors, odors

Product Advantages

- Potential reduction of welding
- Potential replacement of robotic-applied paste adhesive application systems
- May be combined with spot welds or rivets to improve strength and stiffness
- Use in low-volume applications
- Pre-applied adhesive, Purchase-In Assembly, for high-volume production

Application Characteristics

3M™ Structural Adhesive Film SAF6068 has good dimensional stability. It can be handled without a release liner by using thin, slightly oily nitrile rubber gloves to smooth onto complex curved surfaces. Hand dispensing equipment is also available.

Tack and initial adhesion to the first application surface builds up by oil absorption during storage. Alternatively, where higher tack is required to oily surfaces, the product can be converted to a more aggressive tack format. On oil-free or wiped surfaces, the product can be used with a release liner if preferred; the liner is then removed before bonding.

Physical Properties (uncured)

3M Structural Adhesive Film SAF6068:

Material Thickness	0.15 mm	Single laminate
	0.40 mm	Single laminate
Color	Red	

Performance Properties (cured)

The product has been tested using minimum (170°C/338°F) and maximum (205°C/401°F) bake cycles used in normal paint bake ovens. It cures rapidly under induction cure conditions typically (4 seconds at 200°C/392°F). Full induction cure requires the application of pressure.

Typical results on 0.8mm steel under minimum and maximum bake conditions are as follows:

	60G60GHD (oiled**)	60G60GEL (oiled**)
max. bake (shear) MPa	19.1	19.3
min. bake (shear) MPa	17.0	18.0
max. bake T-peel daN/cm	11.9	10.1
min. bake T-peel daN/cm	9.5	6.7

***oil used was a normal automotive stamping oil at normal coating weights*

3M Structural Adhesive Film SAF6068 samples were 0.8mm thick using 25.4 x 12.7mm overlap joints for shear tests pulled at 10mm/minute. T peel tests were performed on 0.8mm substrates to ASTM D1876 and pulled at 254 mm/minute.

Performance Properties (cured) (continued)

Environmental Aging (MPa)

	Condition	A40 (Galvanealed oiled**)	G60 (hot dip, Galvanized oiled**)
A	initial shear strength	15	17.2
B	A+250h @ 70°C	15	16.6
C	condensing humidity	15.2	14.8
D	250h salt spray	14.7	14.8
E	5 environmental cycles	13.8	15.9
	Condition	60G60GEL (oiled**) max. bake	60G60GEL (oiled**) min. bake
F	14 days cataplasmic test	12.5	12.3

** *Oil used was a normal automotive stamping oil at normal coating weights.*

C: 3 weeks at 38C, 98% RH
D: 5% NaCl 35C
E: 16h @ 70C, 24h@98%RH, 38C, 8h@-30C, cycling
F: Renault D47 1165/H14)

Torsional Impact to GM 9751P (Nm):

	A40 Galvanealed	G60 Hot Dip Galvanized
Initial	6.8 (no failure)	6.8 (no failure)
250h@70°C	4.5 (coating failure)	6.8 (no failure)
Condensing humidity	4.5 (coating failure)	6.8 (no failure)
Salt spray	4.5 (coating failure)	6.8 (no failure)
5 environmental cycles	4.5 (coating failure)	6.8 (no failure)

Engineering Information:

Shear modulus GPa (TAST***)	0.63 +/- 0.05
Shear strength (Mpa) (TAST)	43.5 +/- 2.3
Tensile modulus Gpa	2.03
Tensile strength Mpa	47
Poissons ratio	0.42

*** ISO 11003-2

Fatigue:
Tests using 3M™ Structural Adhesive Film SAF6068 on tapered strap joints (5251 aluminum) show a fatigue limit of 40% P_0 at 10^7 cycles. At this stress level there was no detectable damage. (BS EN ISO9664)

Notes:

1. While the product has broad spectrum oil compatibility, it is recommended that new oil to metal combinations be tested to specification.
2. For applications involving weld-through or adjacent welding, high local temperatures may result in generation of fume or smoke. Under these conditions local extraction may be used.

Contact Information

Call 1-800-328-1684 for more information. The information provided in this technical document is intended as a guide for this product. For more information, and help selecting a 3M product for an application, please contact a 3M technical service representative.

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Printed in U.S.A.
75-3470-8714-2