

Starting Formulation

SF 4019 One Package Adhesive 828 and 58006 One Package Adhesive – 250 °F Cure EPON™ Resin 828 and 58006

Introduction This one-package epoxy adhesive, when properly formulated, can yield a shelf life of approximately 6 months at 25°C (77°F) and cures rapidly at temperatures above 116°C (240°F). High bond strengths are maintained at temperatures over the range of -55 to 135°C (-67°F to +275°F). Shear strengths useful in some applications are retained at temperatures as high as 177°C (350°F). A maximum service temperature of 149°C (300°F) is suggested for long term performance.

Suggested Uses

- Applications requiring toughness (peel, impact) along with high shear strengths over a wide temperature range. Adhesion is good with metals, ceramics, glass, wood and polar materials.

Features

- One Pack
- Rapid cure above 116°C (240°F)
- High bond strengths -55 to 135°C (-67 to 275°F)
- 149°C (300°F) Maximum service temperature

Formula	Material	Supplier	Pounds	Gallons
	EPON Resin 828	Hexion	85.0	8.76
	EPON Resin 58006	Hexion	25.0	2.81
	Dyhard 100SF (micronized)	Degussa Corp. – Fine Chemicals	10.0	0.86
	Dyhard UR300 (accelerator)	Degussa Corp. – Fine Chemicals	5.2	0.58
	Bentone 27 (thixotrope)	Elemntis Specialties, Inc.	5.0	0.35
	Aluminum 120 (powder)	ALCOA – Specialty Metals Division	<u>20.0</u>	<u>0.89</u>
	Total		150.2	14.25

Mixing Instructions Combine all ingredients and grind to a thixotropic, smooth paste on a three-roll mill or other efficient, low temperature disperser. The powdered components (Dyhard 100SF, Dyhard UR300 and Bentone 27), must be finely dispersed for effective utilization. Adequate dispersion is obtained on a laboratory three-roll mill by passing the blend through three times.

This formulation is a basic starting point and can be modified with a large range of commercial fillers, depending on cost/performance requirements.

Typical Handling Properties Table 1 / Handling Properties

	<u>Units</u>	<u>Value</u>
Expected Working Life @ 25°C (77°F)	months	>6

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@ 38°C (100°F)	months	>1
Form / Viscosity @ 25°C		
Blend		Thixotropic Paste
Density @ 25°C		
Blend	lb/gal	10.5

Application Instructions Coat surfaces to be bonded with the adhesive and press together lightly; contact pressure is sufficient to develop maximum bond strength. The bond line temperature should be brought to 250°F and maintained for a minimum of 40 minutes to effect a thorough cure. Shorter cure periods at higher temperatures may also be employed. Only surfaces free of dirt, oil, grease, or other contaminants should be bonded. Sandblasting or acid etching are the preferred procedures for preparing metal surfaces. Abrasion of the bonded surfaces in combination with vapor degreasing or solvent wiping are other common preparation methods.

Cure Schedule 40 minutes @ 121°C (250°F) or 30 minutes @ 149°C (300°F) Shorter cure periods at temperatures up to 204°C (400°F) may also be employed.

Typical Cured State Properties Table 1 / Adhesive Properties – Aluminum to Aluminum

<u>Test Property</u>	<u>Type of Break</u>	<u>ASTM</u>	<u>Units</u>	<u>Value</u>
Tensile Shear Strength		D-1002		
@ -55°C (-67°F)	Cohesive		psi	3100
@ 25°C (77°F)	Cohesive		psi	3500
@ 82°C (180°F)	Cohesive		psi	4100
@ 121°C (250°F)	Cohesive		psi	3400
@ 149°C (300°F)	Cohesive/Adhesive		psi	700
90° Peel Strength @ 25°C, width			lb/inch	8.1

Storage Recommendations regarding storage conditions can be obtained by visiting our web site at www.hexion.com

General Information

These are starting formulations and are not proven in the user's particular application but are simply meant to demonstrate the efficacy of the products and to assist in the development of the user's own formulation. It is the user's responsibility to fully-test and qualify the formulation, along with the ingredients, methods, applications or equipment identified herein ("Information"), by the user's knowledgeable formulator or scientist, and to determine the appropriate use conditions and legal restrictions, prior to use of any Information.

Safety, Storage & Handling

Please refer to the MSDS for the most current Safety and Handling information.

Exposure to these materials should be minimized and avoided, if feasible, through the observance of proper precautions, use of appropriate engineering controls and proper personal protective clothing and equipment, and adherence to proper handling procedures. None of these materials should be used, stored, or transported until the handling precautions and recommendations as stated in the Material Safety Data Sheet (MSDS) for these and all other products being used are understood by all persons who will work with them. Questions and requests for information on Hexion Inc. ("Hexion") products should be directed to your Hexion sales representative, or the nearest Hexion sales office. Information and MSDSs on non-Hexion products should be obtained from the respective manufacturer.

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