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Product Data

ARALDITE® 2027

(XD 4712/XD 4713)

TWO COMPONENT POLYURETHANE ADHESIVE

DESCRIPTION:

Araldite 2027 is a two component, room temperature curing, beige colored, thixotropic polyurethane adhesive specifically designed for bonding of SMC. Araldite 2027 also bonds many other thermoset and thermoplastic materials and metals.

APPLICATIONS:

- SMC
- Thermoplastics
- Metals
- Composites

ADVANTAGES:

- Primerless SMC bonding
- Flexible
- 10 minute assembly time
- Bonds well to most thermoplastics
- Excellent gap filling capability

TYPICAL PROPERTIES:

Property	Test Method	Test Values[1] Resin	Hardener
Color/appearance	Visual	Beige liquid	Beige liquid
Specific Gravity	ASTM D-792	1.50	1.45
Viscosity (cP)	ASTM D-2393	18,000	20,000

TYPICAL MIXED PROPERTIES:

Property	Test Method	Test Values[1]
Reaction Ratio (by weight)		100R/97H
Reaction Ratio (by volume)		100R/100H
Pot Life (minutes) (4.fl. oz. mass)	ASTM D-2471	8-10
Mixed viscosity (cP)	ASTM D-2393	Thixotropic paste

[1]Tested @ 77°F (25°C)

RECOMMENDED CURE SCHEDULES:

Temperature	Handling Strength	Minimum Cure Time
50°F (10°C)	5.5 hours	27 hours
59°F (15°C)	4 hours	22 hours
77° (25°C)	1.5 hours	8.5 hours
104°F (40°C)	40 minutes	4 hours
140°F (60°C)	15 minutes	20 minutes
176°F (80°C)	5 minutes	14 minutes

TYPICAL CURED PROPERTIES:

Application of Adhesive

The resin/hardener mix is applied with a spatula to the pretreated and dry joint surfaces.

A layer of adhesive 0.002 to 0.004 inches thick will normally impart the greatest lap shear strength to a joint.

The joint components should be assembled and clamped as soon as the adhesive has been applied. Even contact throughout suffices to ensure proper cure.

Standard Test Specimens
Unless otherwise stated, the figures given below were all determined by testing standard specimens made up by lap-jointing 4 x 1 x 0.06 inch strips of aluminum. The joint area was 0.5 x 1 inch in each case.

Property	Test Method
Lap Shear Strength (psi)	ASTM D-1002
Tested on Metal Substrates	
(Cured 16 hours @ 104°F (40°C)	

Metal	Substrate Thickness (mm)	Test Values[1]
Aluminum	1.0	1950
Carbon Steel	1.0	2025
Stainless Steel	1.0	2050
Galvanized Steel[2]	1.5	1000
Copper	1.5	1700
Brass	1.5	1100

Property	Test Method
Lap Shear Strength (psi)	ASTM D-1002
Tested on Plastic Substrates	
(Cured 16 hours @ 104°F (40°C)	

Plastic	Test Values[1]
SMC	1100
ABS	700
Polycarbonate	975
Acrylic	1000
GRP	975
GRE	1225
Nylon	300
PVC	600

Property	Test Method
Lap Shear Strength (psi)	ASTM D-1002

Effect of Test Temperature

(Load applied 10 minutes after specimens reach test temperature.)

Cure Cycle	Test Temp.	
7 days @ 77°F (25°C)	-58°F (-50°C)	2900
	-22°F (-30°C)	2900
	-4°F (-20°C)	2750
	32°F (0°C)	2950
	68°F (20°C)	2030
	104°F (40°C)	1150
	140°F (60°C)	725
	176°F (80°C)	600
	212°F (100°C)	450
24 hours @ 77°F (25°C) + 30 minutes @ 176°F (80°C)	-58°F (50°C)	3025
	-22°F (-30°C)	3200
	-4°F (-20°C)	3350
	32°F (0°C)	3350
	68°F (20°C)	2750
	104°F (40°C)	1300
	140°F (60°C)	725
	176°F (80°C)	600
	212°F (100°C)	450

Property

Lap Shear Strength on aluminum (psi)

Effect of Immersion

(Cure cycle 16 hours @ 104° (40°C). Immersion for 90 days in media listed.)

Media	Test Values[1]
Standard - As prepared	2050
IMS	1800
Gasoline	1975
Acetic Acid	600
Acetic Acid 10% - 30 day immersion	1875
Xylene	450
Lubricating Oil - HD30	2475
Paraffin	2675
Water @ 68°F (20°C)	2250
Water @ 140°F (60°C)	1125
Water @ 194°F (90°C)	1800

Property			
Lap Shear Strength (psi) ***Effect of Tropical Exposure*** (104° (40°C)/92% R.H.)			
	On Aluminum		
	Cure Cycle	**Exposure Time**	**Test Values [1]**
	16 hrs @ 104° (40°C)	0 days	2050
		30 days	1950
		60 days	1875
		90 days	2100
	On SMC		
	Cure Cycle	**Exposure Time**	**Test Values [1]**
	16 hrs @ 104° (40°C)	0 days	1075
		30 days	1150
		60 days	1000
		90 days	600
		Test Method	
Lap Shear Strength (psi) ***Effect of Heat Aging*** (Cured 16 hours @ 104° (40°C).		ASTM D-1002	
	On Aluminum		
	Aging Temperature	**Exposure Time**	**Test Values[1]**
	158° (70°C)	0 days	2050
		30 days	2475
		60 days	3200
		90 days	3475
	On SMC		
	Aging Temperature	**Exposure Time**	**Test Values[1]**
	158° (70°C)	0 days	1075
		30 days	1250
		60 days	1250
		90 days	900

Property	**Test Method**	**Test Values[1]**
Elongation (%)	ASTM D-638	15
Tensile strength	ISO R527	2050
Roller peel test (pli)	ISO 4578	46
Glass transition temperature, °F (°C)	ASTM D-4065	59 (15)
Thermal cycling – 100 cycles of 6 hour duration from -22°F to 158°F (psi)		1350

[1]Tested @ 77°F (25°C)
[2]Surface degreased only, not roughened.

STORAGE HANDLING INFORMATION

Araldite 2027/A Resin and Araldite 2027/B Hardener
Store in tightly closed containers at room temperature in cool, ventilated area. Keep containers closed to prevent moisture absorption and contamination.

Work in a well ventilated area and use clean, dry tools for mixing and applying. For two component system, combine the resin and hardener according to mix ratio. Mix together thoroughly and use immediately after mixing. Material temperature should not be below 65°F (18°C) when mixing.

SHELF LIFE:

Provided this material is stored under the recommended storage conditions in their original containers, it will remain in useable condition for one year from date of shipping.

PACKAGING:

This product is available in the following package sizes:

Dual Syringes - 50 ml (DS-50)
- 200 ml (DS-200)

SAFETY HANDLING PRECAUTIONS:

Do not use or handle this product until the Material Safety Data Sheet has been read and understood.

Araldite 2027/A Resin
Warning! Causes irritation if inhaled and can cause skin irritation, eye irritation, allergic respiratory reaction, and allergic skin reaction. Avoid breathing vapor or mist. Avoid contact with eyes, skin, and clothing. Keep container closed when not in use. Use with adequate ventilation. Wash thoroughly after handling.

Araldite 2027/B Hardener
Caution! In accord with good industrial practice, handle with due care. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

FIRST AID: In case of contact:

Skin: Immediately wash with soap and water. Remove contaminated clothing and launder before reuse. Destroy contaminated shoes.

Eyes: Immediately flush with water for at least 15 minutes. Call a physician.

Ingestion: If conscious, give plenty of water to drink. Do not induce vomiting. Call a physician.

Inhalation: Remove to fresh air. Administer oxygen or artificial respiration if necessary. Call a physician.

Other: Referral to physician is recommended if there is any question about the seriousness of any injury.

PRECAUTIONARY NOTE:

Thermosetting systems generate heat when curing. The amount of heat and the period of time in which heat is released varies significantly between systems. Additionally, ambient or compound temperature and amount of material mixed can also be factors in the temperature profile of a mixed system.

In some cases, the thermosetting reaction can be vigorous, generating heat sufficient to cause decomposition of the system with subsequent liberation of large volumes of acrid smoke.

A good rule of thumb is never mix more material than can be applied during the stated pot life or gel time. Also take care when using materials in applications other than stated on the Product Data Sheet.

IMPORTANT:

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