

BR[®] 6747-1

BR[®] 6747-1 corrosion inhibiting primer is a one part, chromate based, modified epoxy primer which contains no volatile organic components (VOC).

BR[®] 6747-1 is 100% water-based and does not rely on exempt solvents to achieve its zero VOC level rating. It exceeds all state and federal VOC emission regulations for structural adhesive bonding primers and offers mechanical properties and corrosion resistance equal to that of solvent-based primer systems. In addition, BR[®] 6747-1 also provides outstanding performance with most 250°F – 350°F (121°C – 177°C) curing adhesive systems.

BR[®] 6747-1 offers wide application/processing latitude, simple processing with High Volume Low Pressure (HVLP) or standard air atomizing spray equipment and is insensitive to spray booth conditions — temperature from 65°F – 90°F (18°C – 32°C) and relative humidity from 30% – 70%. For applications which do not allow the use of chromate corrosion inhibitors, please see the Technical Datasheet for BR[®] 6747-1 NC non-chromate-based corrosion inhibiting adhesive bonding primer.

Typical applications for BR[®] 6747-1 include bond primer for aluminum components where corrosion protection is critical, corrosion inhibiting paint primer for aluminum substrates, and effective adhesion promoter for other metals (stainless steel, titanium, and nickel).

Features and Benefits

- Zero V.O.C., 100% water-based
- Service temperature from -67°F to 350°F (-55°C to 177°C)
- MEK wipe resistant after 60 minute cure at 250°F (121°C)
- Can be cured from 250°F to 350°F (121°C to 177°C)
- Excellent corrosion resistance
- Approved primer for AC-[®]130 bonding prep process (Boeing's patented sol-gel technology)
- Recommended use with FM[®] 73M, FM[®] 87-1K, FM[®] 300K, FM[®] 300-2M, or FM[®] 377S

CHARACTERISTICS

Table 1 | Physical Properties (Liquid Primer)

Shipping/transport temperature	15 days maximum at 35°F to 90°F (2°C to 32°C)
Shelf life	12 months at 40°F to 55°F (4°C to 13°C) from date of shipment 6 months at 56°F to 75°F (14°C to 24°C) from date of shipment DO NOT FREEZE
Shop life	30 days maximum at 75°F to 90°F (24°C to 32°C)
Density	20% solids: 8.78 lb/gal (1.05 g/cc) 30% solids: 9.10 lb/gal (1.09 g/cc)
Inhibitor	15% chromate (based on resin solids)

Table 2 | Product Availability

Solids ASTM D 2369	20% or 30% available
Color	Yellow
Size	1 or 5 gallons

PROPERTIES

Table 3 | Primer Properties (Properties of Cured Coating)

Pencil Hardness ASTM D 3363	8H+ after a standard 60 minute 250°F (121°C) cure cycle. 8H+ hardness rating is maintained after 7 day exposure to 75°F (24°C) deionized water, Skydrol [®] D4, MIL-H-5606 fluid, MIL-L-7808 jet engine oil, Jet Fuel A and Methyl Ethyl Ketone (MEK).
MEK Resistance ASTM D 5402	A properly cured coating of BR [®] 6747-1 will withstand 20+ wipes with a shop towel saturated with MEK
Salt Spray Resistance ASTM B 117/ ASTM D 1654	A properly cured coating of BR [®] 6747-1 will pass 40 day, 5% salt spray exposure test per ASTM B117
Filiform Corrosion ASTM D 2803	A properly cured coating of BR [®] 6747-1 which has been top coated with Polyurethane Enamel, scribed to expose bare aluminum and then exposed to 12 normal Hydrochloric Acid vapor for one hour will have no blistering of the top coat after 30 day exposure to 95°F (35°C) and 85% relative humidity.

Metal Bonding

Table 4 | Mechanical Properties with FM[®] 73M 0.060 psf (293 gsm), 250°F (121°C) Cure Adhesive

Property	Test temperature	Result	Substrate
Lap shear ASTM D 1002	°F (°C)	psi (MPa)	2024-T3 bare aluminum, surface treatment: FPL + PAA
	-67 (-55)	7000 (48.3)	
	75 (24)	6500 (44.8)	
	180 (82)	4500 (31.0)	
Floating roller peel ASTM D 3167	°F (°C)	lb/in (kN/m)	2024-T3 bare aluminum, surface treatment: FPL + PAA
	-67 (-55)	62 (10.9)	
	75 (24)	82 (14.4)	
	225 (107)	56 (9.8)	

FM[®] 73M, 0.060 psf (293 gsm) adhesive cured 60 minutes at 250°F (121°C) under 30 - 45 psi (0.21 – 0.31 MPa) pressure.

Table 5 | Mechanical Properties with FM[®] 87-1K 0.060 psf (293 gsm), 250°F (121°C) Cure Adhesive

Property	Test temperature	Result	Substrate
Lap shear ASTM D 1002	°F (°C)	psi (MPa)	2024-T3 bare aluminum, surface treatment: FPL + PAA
	-67 (-55)	5600 (38.6)	
	75 (24)	6600 (45.5)	
	250 (121)	3400 (23.5)	
Floating roller peel ASTM D 3167	°F (°C)	lb/in (kN/m)	2024-T3 bare aluminum, surface treatment: FPL + PAA
	-67 (-55)	42 (7.4)	
	75 (24)	66 (11.6)	
Climbing drum peel ASTM D 1781	°F (°C)	in-lb/in (Nm/m)	2024-T3 bare aluminum, surface treatment: FPL + PAA
	75 (24)	88 (391)	

FM[®] 87-1K, 0.060 psf (293 gsm) adhesive cured 60 minutes at 250°F (121°C) under 30 - 45 psi (0.21 – 0.31 MPa) pressure.

Table 6 | Mechanical Properties with FM[®] 300-2M 0.085 psf (415 gsm), 250°F (121°C) Cure Adhesive

Property	Test temperature	Result	Substrate
Lap shear ASTM D 1002	°F (°C)	psi (MPa)	2024-T3 bare aluminum, surface treatment: FPL + PAA
	-67 (-55)	4300 (29.7)	
	75(24)	5000 (39.5)	
	300 (149)	1800 (12.4)	
Floating roller peel ASTM D 3167	°F (°C)	lb/in (kN/m)	2024-T3 bare aluminum, surface treatment: FPL + PAA
	75 (24)	32 (5.6)	
Climbing drum peel ASTM D 1781	°F (°C)	in-lb/in (Nm/m)	2024-T3 bare aluminum, surface treatment: FPL + PAA
	75 (24)	30 (133)	

FM[®] 300-2M, 0.085 psf (415 gsm) adhesive cured 60 minutes at 250°F (121°C) under 30 - 45 psi (0.21 – 0.31 MPa) pressure.

Table 7 | Mechanical Properties with FM[®] 300K 0.050 psf (244 gsm), 350°F (177°C) Cure Adhesive

Property	Test temperature	Result	Substrate
Lap shear ASTM D 1002	°F (°C)	psi (MPa)	2024-T3 bare aluminum, surface treatment: FPL + PAA
	-67 (-55)	5500 (37.9)	
	75 (24)	6000 (41.4)	
	350 (177)	1700 (11.7)	
Floating roller peel ASTM D 3167	°F (°C)	lb/in (kN/m)	2024-T3 bare aluminum, surface treatment: FPL + PAA
	-67 (-55)	14 (2.5)	
	75 (24)	35 (6.1)	
Climbing drum peel ASTM D 1781	°F (°C)	in-lb/in (Nm/m)	2024-T3 bare aluminum, surface treatment: FPL + PAA
	75 (24)	35 (156)	

FM[®] 300K, 0.050 psf (244 gsm) adhesive cured 90 minutes at 350°F (177°C) under 30 - 45 psi (0.21 – 0.31 MPa) pressure.

Table 8 | Mechanical Properties with FM[®] 377S 0.080 psf (390 gsm), 350°F (177°C) Cure Adhesive

Property	Test temperature	Result	Substrate
Lap shear ASTM D 1002	°F (°C)	psi (MPa)	2024-T3 bare aluminum, surface treatment: FPL + PAA
	75 (24)	4160 (28.7)	
	250 (121)	3450 (23.8)	
	350 (177)	2150 (14.8)	
Climbing drum peel ASTM D 1781	°F (°C)	in-lb/in (Nm/m)	2024-T3 bare aluminum, surface treatment: FPL + PAA
	75 (24)	24 (107)	

FM[®] 377S, 0.080 psf (390 gsm) adhesive cured 90 minutes at 350°F (177°C) under 30 - 45 psi (0.21 – 0.31 MPa) pressure.

PROCESSING

Primer Storage

BR[®] 6747-1 may be stored at temperatures from 40°F to 55°F (4°C to 13°C) for up to 12 months, from 56°F to 75°F (13°C to 24°C) for up to 6 months and from 75° F to 90°F (24°C to 32°C) for up to 30 days. Specific care should be taken to prevent BR[®] 6747-1 from freezing or from being exposed to temperatures below 32°F (0°C) and above 90°F (32°C).

Mixing

It is not necessary to warm the container to room temperature before opening. Thoroughly mix BR[®] 6747-1 upon opening and agitate during application. NOTE: During transportation and storage conditions the primer may form a layer of soft settling solids at the bottom of the can. It will take more mechanical force to disperse the solids from the bottom if the settling is densely packed. To increase mixing efficiency, we recommend using mixing beads to aid agitation or using a mechanical propeller blade to disperse the settling solids before putting into a shaker or roller machine.

Surface Preparation

A clean, dry, grease-free surface is required for bonding. BR[®] 6747-1 is used with standard cleaning techniques involving a four step procedure of solvent degreasing, alkaline cleaning, chemical deoxidizing (etching) and phosphoric acid anodizing*. General guidance for etching and phosphoric acid anodizing can be found in ASTM D 2651 and ASTM D 3933, respectively. Best results for aluminum feature priming after appropriate surface preparation.

*Boeing patent 4,085,012 April 1978. Phosphoric acid anodizing is now being used by a large number of aircraft manufacturers due to the improved surface bond durability it provides.

Equipment

BR[®] 6747-1 may be sprayed using a variety of equipment including hand-held, automated, conventional air-atomizing, HVLP or electrostatic spray equipment. Parts may be racked for spray and cured in any position convenient for the process. Refer to Tables 9 and 10 for specific equipment set-up recommendations.

Primer Thickness

Spray a dry primer thickness of 0.0001 to 0.0003 inches (0.0025 to 0.0076 mm) for optimum mechanical properties. Spray technique consists of applying smooth and even coats. The primer should be applied using two to three thin box coats (4 - 6 cross coats) to obtain the final film thickness. Additional coats of primer may be sprayed and cured onto previously cured areas without loss of properties.

Spraying

For uniform coating, apply one thin coat of primer to cover the entire part and allow to dry completely (primed portion color will change to lighter yellow when dry). Then spray additional box coats on top to achieve the desired primer thickness. Allow 30 to 60 seconds drying between each box coat.

Spray Gun Cleaning

If using a gun in which a solvent-based material has been used, the spray gun must be rinsed and sprayed for at least 1 minute with deionized water prior to loading the gun with BR[®] 6747-1 primer.

Clean the gun immediately after use by rinsing and spraying with deionized water.

Dry Time

15 to 60 minutes at 75°F (24°C) and less than 55% relative humidity is recommended.

Primer Cure Cycle

Dry primer coatings are recommended to be cured at 250°F (121°C) for 60 minutes to obtain a surface which is scratch and MEK wipe resistant. The primer may also be cured at temperatures up to 350°F (177°C) for 60 minutes to obtain similar properties. Assemblies primed with BR[®] 6747-1 and then cured can be stored for six months and longer without degradation of the final bond strength. Assemblies that have been primed and cured should be protected from dust and oil by wrapping in protective sheeting such as Kraft paper. Stored assemblies should be wiped with a suitable solvent prior to bonding.

Bonding Cycles

BR[®] 6747-1 may be used with most epoxy based thermoset adhesives that cure between 250°F and 350°F (121°C and 177°C). Primed details may be exposed to up to three 60 minute 250°F (121°C) cure cycles with no significant loss of primer properties.

Spray Gun Settings**Table 9 | Settings for Accuspray Spray Gun (HVLP) Series 10**

Fan Adjustment	1 counter-clockwise turn
Fluid control (needle adjustment screw)	2 counter-clockwise turns
Needle size	0.036 in (0.091 cm)
Air cap model	#11
Cup pressure	4 psi (0.02 MPa)
Atomization pressure	6 psi (0.04 MPa)
Spraying distance (nozzle to panel)	14 in – 16 in (36 cm – 41 cm)
Room temperature	70°F – 90°F (21°C - 32°C)
Humidity	< 65%
Air supply pressure	Minimum 80 psi (0.55 MPa)

Table 10 | Settings for Devilbiss Spray Gun (HVLP) Model JGHV-531

Fan Adjustment	1 counter-clockwise turn
Fluid control (needle adjustment screw)	1/2 – 3/4 counter-clockwise turns
Needle size	0.034 in (0.086 cm)
Air cap model	46 MP
Cup pressure	4 psi (0.02 MPa)
Atomization pressure	38 psi (0.26 MPa)
Spraying distance (nozzle to panel)	14 in – 16 in (36 cm – 41 cm)
Room temperature	70°F – 90°F (21°C - 32°C)
Humidity	< 65%
Air supply pressure	Minimum 80 psi (0.55 MPa)

HEALTH & SAFETY

Please refer to the product SDS for safe handling, personal protective equipment recommendations and disposal considerations.

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Solvay

Composite Materials HQ
4500 McGinnis Ferry Rd
Alpharetta, GA 30005-3914 USA

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