RECOMMENDED SURFACE PREPARATION FOR EPOXIES, ACRYLICS AND SILICONES

General:

This bulletin describes the recommended for maximum adhesion procedure(s) for treating the surfaces of various substrates before applying an EMI epoxy, acrylic or silicone-based compound. Listed by number are different types of surface treatments. The table indicates the appropriate procedure number(s) for each substrate and compound combination. For example, the proper treatment prior to applying an EMI epoxy compound to an alumina surface is found in table 1 to be procedure 10, which specifies that the alumina is to be degreased per procedure 1 and abraded with a 325 mesh carborundum/water slurry.

Note: Although many applications actually require only surface cleaning (of dust, grease, oxidation), maximum adhesion is assured by the procedures given here.

Contact Information:

Parker Hannifin Corporation
Chomerics Division
77 Dragon Court
Woburn, MA 01801

phone 781 935 4850
fax 781 933 4318
chomailbox@parker.com

www.chomerics.com
www.parker.com/chomerics

Procedures:

(Refer to Table 1 to determine applicable procedures)

1. Clean with methyl ethyl ketone, followed by toluene. Air dry.
2. Roughen surface with 220 grit sandpaper.
3. Vapor degrease and apply trichlorethylene.
4. Dip for 10 minutes in a 70°C solution consisting of 66 parts of sodium dichromate, 666 parts of 96% sulfuric acid, and 1000 parts of distilled water. Follow with demineralized water wash.
5. Degrease per procedure 1. Etch for 1 to 2 minutes in a room temperature solution consisting of 15 parts of 22% ferric chloride, 30 parts of concentrated nitric acid and 197 parts of water.
6. Degrease per procedure 1. Etch for 5 seconds in concentrated nitric acid (specific gravity 1.42).
7. Wet abrade composite panels with 180 – 220 grit abrasive sheet to completely remove the gloss from surface of panel. Rinse with deionized water and check for water break free surface. Water break free is defined as supporting an unbroken film of water with no formation of discrete droplets for at least 30 seconds. Allow the water break free surface to air dry. Do not wipe or solvent wipe after achieving water break free surface. Apply primer or coating within 8 hours of surface preparation.
8. Flame treat with an oxidizing flame.
9. Sodium etch prior to bonding.
10. Degrease per procedure 1 and abrade with a 325 mesh carborundum/water slurry.
11. Scrub with non-chlorinated cleanser, and rinse with water until all detergent has been removed.
12. Irridite (chromate conversion coat) per MIL-DTL-5541, Class III.
13. Clean with soap and water, and rinse well.
14. Clean with IPA (isopropyl alcohol), wipe, and air dry.
15. Apply recommended silicone primer.

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Table 1 Substrate Preparation Procedures

Material	Resin Type		
	Epoxy	Acrylic	Silicone
ABS	*	14	14 + 15
Acrylic	*	14	14 + 15
Alumina	10	1 or 3	1 + 15
Aluminum	1 + 4 or 1 + 7 or 1 + 12	N/A	1 + 2 + 15 or 1 + 7 + 15 or 1 + 11 + 15
Beryllia	10	1 or 3	1 + 14
Copper	1 + 2 + 7	N/A	1 + 2 + 15 or 1 + 7 + 15 or 1 + 11 + 15
Epoxy Polyamide	1 + 3	1	1 + 15
Ferrite	1 + 2	N/A	1 + 2 + 15
Kovar	1 + 3	N/A	*
Nickel	1 + 6		1 + 2 + 15 or 1 + 7 + 15 or 1 + 11 + 15
Polycarbonate	*	13 or 14	13 or 14 + 15
Polyester	1 + 2 + 1	*	1 + 15
Polyethylene	1 + 8	1 + 8	1 + 8 + 15
Polyimide	1	*	1 + 15
Polysulfone	1 + 2	1 + 2	1 + 15
Polytetrafluoroethylene	1 + 9	1 + 9	1 + 9 + 15
Polyurethane conformal coating	14	14	14 + 15
Silicon (metal)	1 or 3	N/A	1 + 2 + 15 or 1 + 7 + 15 or 1 + 11 + 15
Silicone rubber	*	*	2 + 15
Silver	1 + 2	N/A	1 + 2 + 15 or 1 + 7 + 15 or 1 + 11 + 15
Solder	1 + 2	N/A	1 + 2 + 15 or 1 + 7 + 15 or 1 + 11 + 15
Stainless steel	3	N/A	1 + 2 + 15 or 1 + 7 + 15 or 1 + 11 + 15
Tin	1 + 2	N/A	1 + 2 + 15 or 1 + 7 + 15 or 1 + 11 + 15
Zinc	1 + 2	N/A	1 + 2 + 15 or 1 + 7 + 15 or 1 + 11 + 15

*Substrate not normally coated or bonded with compound indicated.