



Adhesives and Coatings for Harsh Environments

BONDIT™ A-3, A-43, A-53, C-21, C-31, C-52, C-6

APPLICATION INSTRUCTIONS

GENERAL

These adhesion promoters / primers are used for overmolding with many thermoplastics, thermoset products and elastomers over a very wide range of substrates. They are also used as corrosion protection, sealants and even adhesives with very thin bond lines between dissimilar materials (such as HDPE to glass).

PREPARING SURFACES

Abrading options (in order of preference)

1. Degrease.
2. Glass, plastic bead or AlOx blast the metal and polymer surfaces (#80 - #120 AlOx is good on both);
3. Abrade the metal and polymer with Al oxide paper (100-150 grit, 3M wall board sand paper is good);
4. Abrade the metal and polymer with Scotchbrite (red or green);
5. For metals pure metal substrates provide the optimum adhesion; metal oxide surface is acceptable,
6. It is particularly important with most plastics to remove the "gloss" finish and leave a "matt" finish.
7. Thermoplastic urethane--removing the gloss is usually not necessary, unless plasticizers are present;
8. Thermoplastic rubbers--removing the gloss surface is important;
9. Rubbers must be abraded aggressively to remove the plasticizers that have bloomed to the surface during vulcanization of the rubber; mechanical abrasion with wire wheel is optimum and commonly used, and chemical wipe is least desirable but can be used (be sure to allow full evaporation of solvent), depending on the type of rubber.

Cleaning

10. Use degreaser as required.
11. Wash / scrub with isopropyl alcohol (preferred), TBA, MEK, acetone or equivalent degreaser.
12. Go to next step without delay. (Tests demonstrate the clean metal surface of stainless steel 316 oxidizes in 15 minutes to the point of requiring de-oxidizing in order to have optimum bonding: clean / pure metal = optimum bonds.)

PRIME COAT

Applying prime coat

13. Apply thin coat of primer with -- Syringe, Lint free wipes, cotton applicator, or brush, Dipping, Rolling, or Spray.
14. Excess will easily drain off to a uniform coating of approximately 1 mil. Typical is ½ to 1 ½ mill coatings. Thick coatings form weak boundary layers, so avoid them. Viscosity is typically 2 to 4 cps. . .very thin like water.
15. On metal, glass and ceramic normally use 1 coat. When using A-3, 3 to 4 coats, with light drying in between coats, is recommended for polymer and elastomer substrates. When using all other products, 1 to 2 coats are adequate on polymer substrates.

CURING

Cure with ambient air or heat source,

16. Heat gun, oven, heat lamp, or ambient air.
17. Ambient cure may require 30 - 40 minutes depending on temperature and humidity and is acceptable. Humidity must be below 85%, or slightly warm the substrate to drive off moisture.
18. Cure temperatures up to 215°C/420°F for fast cures are acceptable. Be careful not to burn the coating.
19. Typically for metals, ceramics, and glass use 150°C/300°F, 5 to 8 minutes, depending on coating thickness, lower temperatures are acceptable including ambient cure.
20. For piezoelectric ceramics use 121°C/250°F for 15 minutes. Lower temperatures are acceptable, including ambient.

Cure regimes for polymer substrates

21. Thermoplastic cure temperatures are typically limited by the polymer temperature rating and application conditions.
 - HDPE & PVC, insulation, higher temperatures may be used straight from the heat gun, if some insulation softening in that application is not a problem.
 - HDPE & PVC plate stock, 121°C/250°F for 15 minutes works well without melting or distorting the stock.
 - UHMW, 138°C/280°F will form a better bond without distorting the substrate.
 - For TPU (thermoplastic urethane) use lower temperatures <160°C/320°F. High temperatures will easily melt the substrate, and cause bubbling due to secondary reactions with the cured primer at high temperatures.
22. For high temperature engineering plastics such as ECTFE, ETFE, PVDF, PVF, PPS, PEEK, a wide range of cure regimes are possible.
23. For rubbers and urethane elastomers, wide ranges of cure regimes are possible, since they mostly will withstand fairly high temperatures.
24. For epoxies and other cross-linked substrates, typically a wide range of cure regimes are possible, limited by the substrate temperature rating.

Inspection

25. Ensure that the primer has cured to a dry surface, particularly when using low temperatures for curing.
26. Usually appears optically clear or slightly amber as satin or gloss finish.

Completion

27. Work life (manufacturing window) of cured primer is three to four weeks.
28. For best results with the next operation use a light isopropyl alcohol wipe to clean and re-activate the surface. In some cases such as overmolding with PE and TPU this is very important.
29. If longer than 4 weeks reapply primer coat; just wipe/wash with IPA before reapplication of new coat.

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