

PR-1500 Series Application Guide

Aerospace sealants



Introduction

PPG PRC® polyurethane materials are designed for potting electrical connectors and/or molding electrical cable assemblies. These polyurethane compounds are suitable where high dielectric, high abrasion, flexibility, high tensile strength, and excellent hydrolytic stability are required.

Note: It is important to read and understand the SDS, process specifications, and technical data sheets before working with these products.

Surface preparation

Immediately before applying material to primed substrates, connectors or metal surfaces should be cleaned with solvent (i.e. PPG Desoclean® 110). Contaminants such as dirt, grease, and/or processing lubricants must be removed prior to sealant application. Do not expose wire insulation and inserts to the cleaning solvent beyond the time necessary for adequate cleaning.

A progressive cleaning procedure should be employed using the appropriate solvents and new lint free cloth (reclaimed solvents or tissue paper should not be used). Always pour solvent on the cloth to avoid contaminating the solvent supply. Wash one small area at a time.

It is important that the surface is dried with a second clean cloth prior to the solvent evaporating to prevent the redeposition of contaminants on the substrate.

Substrate composition can vary greatly. This can affect sealant adhesion. It is recommended that adhesion characteristics to a specific substrate be determined prior to application on production parts or assemblies.

For a more thorough discussion of proper surface preparation, please consult the SAE Aerospace Information Report AIR 4069. This document is available through SAE, 400 Commonwealth Avenue, Warrendale, PA 15096-0001.

Application of primer

For maximum adhesion strength between PR-1500 series potting/molding compounds and the material to which it is to be bonded, the following surface preparations are required:

Note: Do not dip priming brush into primer supply. To maintain an uncontaminated primer supply, pour a small portion of primer into a clean container from which it should be used. Reseal primer supply immediately after portion has been removed.

Metal

In order for PR-1500 series potting compounds to adhere, metal surfaces must be primed with PR-425 primer. Thoroughly mix Part A with Part B of the primer. An optional PR-425R may be used up to 10% volume to achieve a thinner consistency. Do not mix more than can be used within the application life. Brush a thin film of mixed PR-425 on all surfaces of connectors and on wire, but not on the insulation. Let primer dry for 30 minutes at 75°F (24°C). If the primed surface becomes contaminated, re-clean lightly with methyl ethyl ketone and dry. Stripping the primer from the connector and repriming is not necessary. Please read the technical data sheet for PR-425 for further details.

Neoprene

To obtain good adhesion to neoprene insulation, the surface should be abraded with a suitable abrasive or wire brush to remove grease, oil, wax or mold release. Remove rubber particles with a dry oil-free brush. Apply a liberal coat of PR-1523-M primer to the clean neoprene surface by brush and allow to dry for approximately 30 minutes at 75 °F (24 °C). After 30 minutes drying time, wipe off excess PR-1523-M primer with a clean, gauze sponge and start the potting/molding procedure. Drying time of PR-1523-M should not exceed four hours at 75 °F (24 °C) before potting or molding. If primed surface becomes contaminated or potting or molding is not accomplished with four hours after application of PR-1523-M, buff neoprene and repeat priming procedure.

Note: PR-1523-M is hygroscopic and must be kept free of moisture. When PR-1523-M hydrolyzes, a dark grainy precipitate is formed decreasing the primer's usefulness. Material containing precipitate should not be used.

Polyvinyl chloride

To obtain good adhesion to polyvinyl chloride insulation, the surface should be tackified with methyl ethyl ketone. The use of PR-1543 may be necessary only with some formulations of polyvinyl chloride. Therefore, it is suggested tests be made to determine the adhesive strength of PR-1500 series potting/molding compounds to the polyvinyl chloride in question.

If a primer is required, then apply a thin coat of PR-1543 primer to the tackified surface by brush and allow to dry for approximately 30 minutes at 75 °F (24 °C). After 30 minutes drying time, wipe off excess PR-1543 primer with a clean, gauze sponge and start the potting/molding procedure. Drying time of PR-1543 should not exceed four hours at 75 °F (24 °C) before potting or molding. If primed surface becomes contaminated or potting or molding is not accomplished with four hours after application of PR-1543, buff primed surface and repeat priming procedure.

Note: PR-1543 is hygroscopic and must be kept free of moisture. When PR-1543 hydrolyzes, a precipitate is formed decreasing the primer usefulness. Material containing precipitate should not be used.

Teflon and other fluorocarbons

To obtain good adhesion to insulation made of Teflon and other fluorocarbon resins, it is essential the insulation be etched or treated to provide a bondable surface. After neutralization the etchant, in accordance with the manufacturer's instructions, apply PR-1500 series potting/molding compounds directly to the etched surface without primer.

Repair

To obtain good adhesion to previously cured PR-1500 series potting/molding compounds, the surfaces should be buffed with a suitable abrasive to remove grease, oil, wax or mold release. Remove rubber particles with a dry, oil free brush.

Caution: Do not use solvents for cleaning cured PR-1500 series products. Apply new PR-1500 series product directly to buffed surface and cure as recommended. No primer is required.

Mixing instructions

Proper mixing and correct proportions are extremely important to obtain optimal results. Mixing by experienced personnel at a central location is recommended.

Two-part kits

Do not open containers until ready to use. Mix the entire contents of kit, parts A and B. Do not proportion out these products nor attempt to reseal a kit for future use.

PR-1535, PR-1538, PR-1547

Part A will solidify partially at room temperature. Whenever this condition is found, loosen lid and warm on a hot plate under a fume hood to 220±10 °F (104±6 °C). Do not heat over 230 °F (110 °C). When warming the material, use a thermometer to determine the actual material temperature. Liquefaction is complete when the material becomes smooth and uniform in appearance and loses all signs of graininess. Stirring is essential during liquefaction to provide a uniform material and to hasten melting. Care should be taken to dissolve all solidified Part A around the top of container. Trace quantities of unliquefied Part A will cause premature solidification.

PR-1590, PR-1592

Part A will partially solidify at room temperature. Whenever this condition is found, loosen lid and warm on a hot plate under a fume hood to $250 \pm 10^{\circ}\text{F}$. ($121 \pm 6^{\circ}\text{C}$). Do not heat over 260°F . When warming the material, use a thermometer to determine the actual material temperature. Liquefaction is complete when the material becomes smooth and uniform in appearance and loses all signs of graininess. Stirring is essential during liquefaction to provide a uniform material and to hasten melting. Care should be taken to dissolve all solidified Part A around the top of container. Trace quantities of unliquefied Part A will cause premature solidification. Do not store Part A at temperatures exceeding 100°F (38°C).

Follow these instructions immediately prior to mixing and using the material. Use the material right after it cools down to room temperature. Do not attempt to reseal and store once the container has been opened and contents heated.

Where a dense compound free of voids is required, it is recommended that the mixed material be degassed before applications are made. Standard vacuum equipment may be used or, for small usage, the material may be degassed in a standard laboratory desiccator connected to a vacuum pump under a vacuum of 28 inches Hg minimum. The material is correctly degassed when the foam is observed to break/collapse.

Premixed and frozen (PMF)

Polyurethane potting and molding compounds in a PMF form should be stored in a freezer at -40°F (-40°C) or below for optimal retention of application properties and shelf life.

Thawing options

Frozen cartridges of premixed sealant are thawed by two approved methods: Air Thawing or Water Bath Thawing. After thawing, the cartridge should be wiped dry, and checked to ensure that condensation

no longer forms before using. A cartridge that has been adequately thawed will have a core temperature of $50\text{-}60^{\circ}\text{F}$ ($10\text{-}16^{\circ}\text{C}$).

Air thaw

Frozen cartridges can be allowed to warm at room temperature, approximately $70\text{-}80^{\circ}\text{F}$ ($21\text{-}27^{\circ}\text{C}$). Ambient thaw usually takes about 30 minutes for cartridges stored at -40°F (-40°C).

Water bath thaw

Place PMF cartridges upright in a circulating water bath with the water temperature set to $120 \pm 5^{\circ}\text{F}$ ($49 \pm 3^{\circ}\text{C}$). Care should be taken to ensure that the cartridges are sealed, with caps tightly secured to prevent water intrusion. Thawing typically takes about 4 to 7 minutes for a cartridge stored at -40°F (-40°C).

It is important to note that the relevant sealant material specification may prescribe its own thaw instructions. Please refer to those thaw instructions should this be the case.

Health precautions

This product is safe to use and apply when recommended precautions are followed. Before using this product, read and understand the Safety Data Sheet (SDS), which provides information on health, physical and environmental hazards, handling precautions and first aid recommendations. An SDS is available on request.

Avoid overexposure. Obtain medical care in case of extreme overexposure.

For industrial use only. Keep away from children. Additional information can be found at: www.ppgaerospace.com

For sales and ordering information call 1-800-AEROMIX (237-6649).

For emergency information call: 1-412-434-4515
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Issue Date: 10/23
Supersedes: 61/22
Lit: 4804