Adhesion promoter Application guide

For use with PPG's PRC®, Pro-Seal®, and Permapol® branded polysulfide and polythioether aircraft sealants.

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Issued: 10/18
Supersedes: NEW
LIT#4613

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Use

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Introduction

The use of an adhesion promoter can significantly enhance the adhesion and bonding characteristics of polysulfide and polythioether aircraft sealant to a desired substrate. In addition, the use of adhesion promoter can sometimes compensate for surfaces that are difficult to access and may not have been adequately cleaned and prepared. PPG always recommends the use of an adhesion promoter for repair purposes or when bonding to surfaces that are aged and have already been exposed to fuel and other fluids.

The use of adhesion promoter will only serve to increase bonding characteristics and will not in any way reduce or alter the sealant performance. However, prior to the usage of any adhesion prompter, there are several aspects that need to be understood, such as substrate type and composition, type of sealant being used, type of application (such as repair work), surface cleaning preparation, and choice or appropriate adhesion promoter.

Adhesion promoter	Used with sealant	Description & typical application
PR-141	PR-1784	European non-crazing AP for use with PR-1784 on aircraft transparencies surfaces
PR-142	PR-1425	Non-crazing AP for use with PR-1425 on aircraft transparencies surfaces
PR-148	Polysulfide sealants such as P/S 870, P/S 890, PR-1422, PR-1440, PR-1750, PR-1775, PR-1776M, PR-2007	AMS3100 general purpose AP. PR-148 is the recommended adhesion promoter for both fresh sealing and repair work when using polysulfide sealant. PR-148 is required for repair work over aged surfaces, or when bonding to other sealant chemistries, such as PR-2001 polythioether sealant. Suitable for use on metals, painted surfaces, and composite. Not recommended on transparencies surfaces where crazing is a concern
PR-148AF		European aromatic-free version of PR-148
PR-149	PR-1827	Special-purpose AP for use with PR-1827
PR-182	Polysulfide and Polythioether sealants	0-VOC water-based formulation. AMS3100 general purpose AP for metals, painted surfaces, and composite
PR-184	PR-2001, PR-1782	European AP for direct-to-metal sealing with PR-2001 and PR-1782 on Airbus applications. Limited mainly to Airbus use
PR-186		European formulation of PR-187 for use with polythioether sealants. Used in certain European OEM processes.
PR-187	Polythioether sealants such as PR-1828, PR-2001, PR-2001 LW, PR-2050	General purpose AP for metals, painted surfaces, and composite. PR-187 is the recommended adhesion promoter for most applications when sealing with polythioether sealants, and is required when bonding over polysulfide sealant or for repair work. Not recommended on transparencies surfaces where crazing is a concern.
PR-188	Polysulfide and Polythioether sealants	Low-VOC exempt solvent* AP. AMS3100 general purpose AP for metals, painted surfaces, and composite. *Exempt solvent only in the USA.
PR-1735	PR-1425	European equivalent to PR-142; used in certain European OEM processes.
PR-1826AP	PR-1826	General purpose AP for metals, painted surfaces, and composite. Recommended when using PR-1826 sealant.
PR-1861	PR-1425CF, PR-1829	Non-crazing AP for use with aircraft transparencies surfaces. Recommended when using PR-1425CF and PR-1829 sealants.

The above recommendations are based on PPG's internal testing, and customers should always refer to their own specifications or process and validate new materials before implementing any design changes. Substrate composition and bonding characteristics can vary greatly, and if there are any questions regarding proper surface preparation or use of adhesion promoter, please contact your local PPG sales representative or aerospace engineering services department.

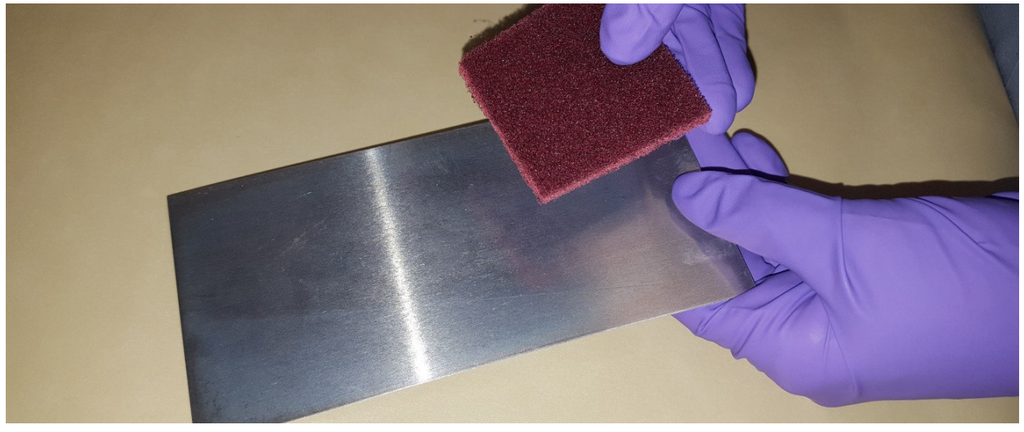
Application process

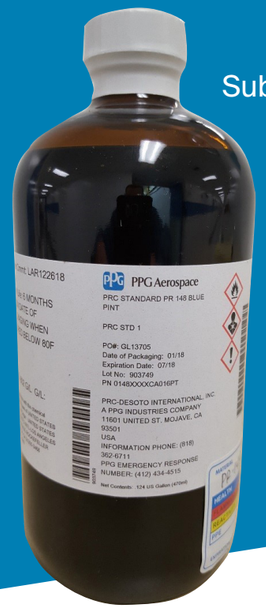
Note: It is important to read and understand the SDS, process specification, and technical data sheet before working with any chemicals. Always wear appropriate PPE as determined by your site health and safety specialist.

Surface preparation

Existing or aged sealant that is being repaired should be scuffed with sandpaper or an abrasive mat to create a fresh, rough surface and to remove any loose particles. Depending on the surface conditions and process requirements, certain metals may need mechanical cleaning by grit-blasting, abrasive mat or sandpaper scuffing. For bonding to painted and coated surfaces, please refer to the coating manufacturer for recommended surface activation procedures. Aged paints, primers and urethane topcoats may require a light scuffing to reactivate the surface. Prepare composite surfaces as required by the relevant process, either by removing the protective surface ply, or by scuffing with an abrasive mat.

Contaminants such as dirt, grease, processing lubricants, and dust from sanding or grit-blasting must be removed to ensure good adhesion prior to application of adhesion promoter and sealant. Immediately before applying adhesion promoter to substrates, the surfaces should be cleaned with a solvent such as Desoclean® or another approved aerospace cleaning solvent. A progressive cleaning procedure should be employed using the appropriate solvents and new, lint-free cloth conforming to AMS3819 or as specified in the relevant process.





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Application of adhesion promoter

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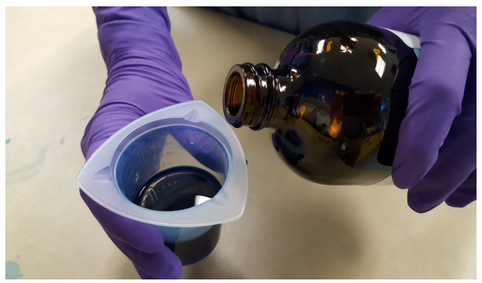
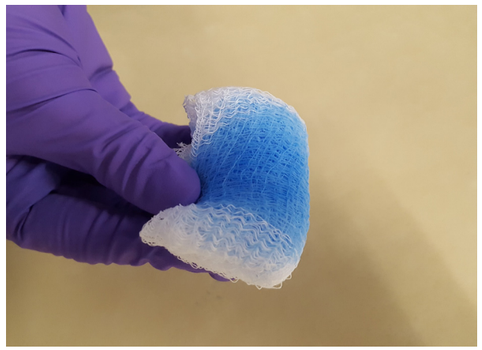
Open the container and ensure there is no crust or debris around the lid, and no FOD or particles in the container. The adhesion promoter should be a uniform liquid. If there are any particles and crystallization in the liquid, or any other signs of contamination, the container should be discarded.

Into a separate clean cup or suitable container, pour out as much adhesion promoter as will be required for the job, up to a maximum of what can be used within 2 hours. Open time of the adhesion promoter is affected by humidity, so discard any unused adhesion promoter if it becomes cloudy or forms particles, or has been open for greater than 2 hours. If there is leftover adhesion promoter at the end of the shift, discard it. Do not pour leftover adhesion promoter back into the original container.



Carefully clean around the lid and mouth of the container to remove any residue, and re-seal the container. Place the bottle back into the appropriate storage environment as listed on the label. As long as the original container remains clean and free of debris, and the liquid does not have any contaminants, the adhesion promoter may be used repeatedly up to the listed shelf life. Discard the container once any crystallization or contamination occurs, or the shelf life expires. Small bottles, such as the 4 dram (12 mL) vial that come packaged with a Semkit® are one-time-use only and should be discarded after use

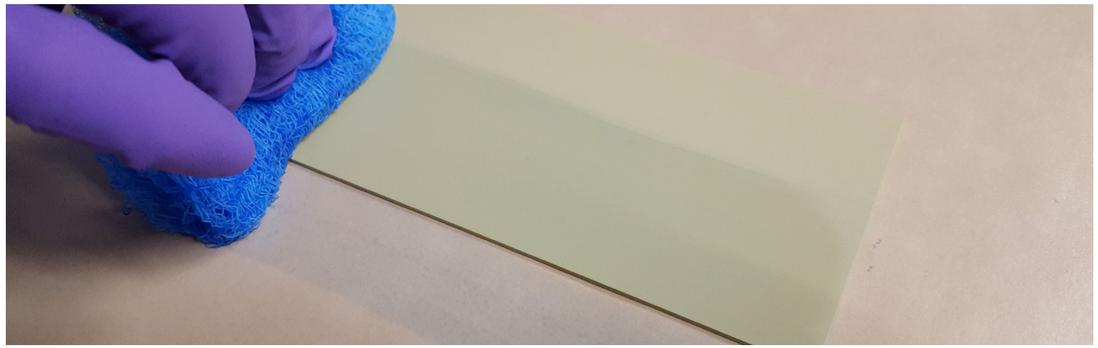
Good



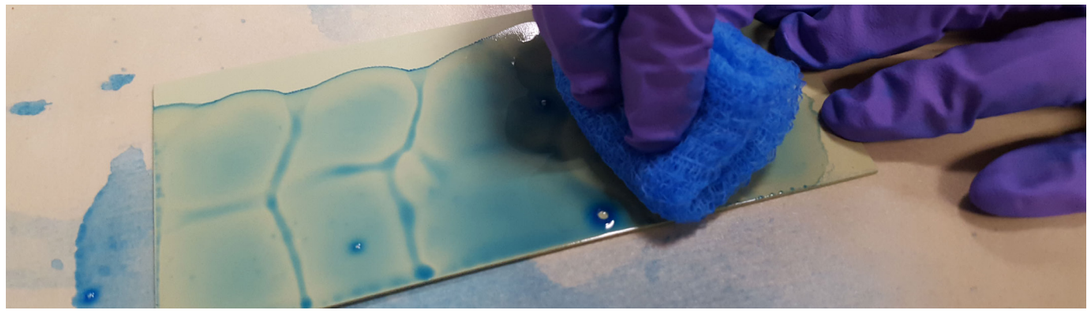
Bad

Lightly wet a clean gauze pad or AMS3819 wipe with the adhesion promoter. The gauze or pad should be moist, but not soaked or dripping wet.

Good



Bad



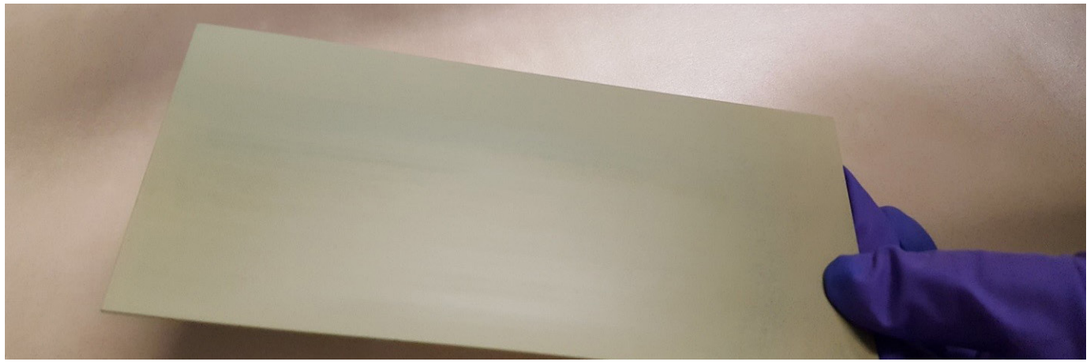
Apply a thin, uniform film to the surface of the substrate by wiping the substrate with the wetted gauze or pad. Adhesion promoter is not a paint or coating, it is not necessary to build up a certain thickness. A very thin layer, just enough to wet the surface, is all that is needed for the chemicals in the adhesion promoter to activate the surface for bonding.

Be careful not to contaminate the gauze or pad when applying the adhesion promoter. If the pad becomes contaminated or comes in contact with a dirty surface, discard the pad, and get a new, clean pad wet with adhesion promoter. It is recommended to use a fresh pad after 2-3 application wipes.

There should be no pools or puddles of adhesion promoter on the substrate. If the adhesion promoter has been over-applied, wipe it away with a clean pad, re-clean the surface, and start again.

Ideally, the adhesion promoter should dry in a few seconds if it has been applied correctly, however it may take longer to dry at low temperatures or at high humidity levels. Recommended application conditions are 50-90 °F (10-32 °C) and 20-80% Relative Humidity.

Water-based adhesion promoter, such as PR-182, may dry very slowly and have difficulty wetting certain surfaces. It may require several applications or wipes of PR-182 to completely coat a surface with a thin film.



After application of the adhesion promoter, place the parts in a clean environment and allow them to dwell for at least 30 minutes, or as recommend on the relevant adhesion promoter technical data sheet or process specification. After the dwell time, sealant can be applied directly over the areas treated with adhesion promoter.

If sealant is not applied within 8 hours of the adhesion promoter application, the surface should be re-cleaned and Adhesion promoter re-applied.

Health and safety

This product is safe to use and apply when recommended precautions are followed. For information on the application of coatings, read and understand PPG's aerospace, PRC-DeSoto "Safe Handling Guide". For information on the health, physical and environmental hazards, handling precautions and first aid recommendations, refer to the Safety Data Sheet (SDS) before using this product. An SDS is available on request. Avoid overexposure. All mixing and spraying must be conducted with adequate ventilation and proper personal protective equipment as recommended. Obtain medical care in case of symptoms of overexposure as outlined in the Safety Data Sheet (SDS).

For industrial use only. Keep away from children.

For emergency medical information call
1-800-228-5635.

Additional information can be found at:
www.ppgaerospace.com

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

For help with sealant application, please refer to our aerospace sealants application guide.

For any remaining questions, please contact your local PPG representative, PPG's aerospace engineering services, or call 1-800-AEROMIX.