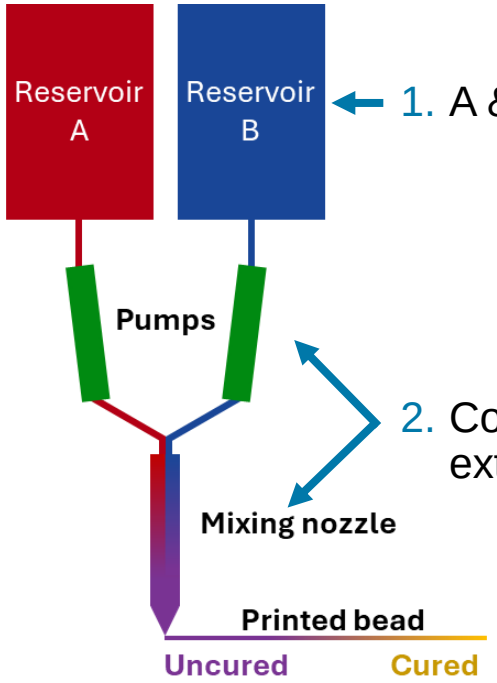
PPG ARE™ 3D Printed Sealants

How PPG ARE™ 3D Printed Sealants Work

Ambient Reactive Extrusion (ARE)



1. A & B Pack are loaded into the 3D printer
2. Components are pumped to mixer and extruded
3. 3D printer moves position to create the desired part geometry
4. Material reacts and begins to cure on the print bed

PPG ARE™ automates part production using qualified PPG Aerospace Sealants

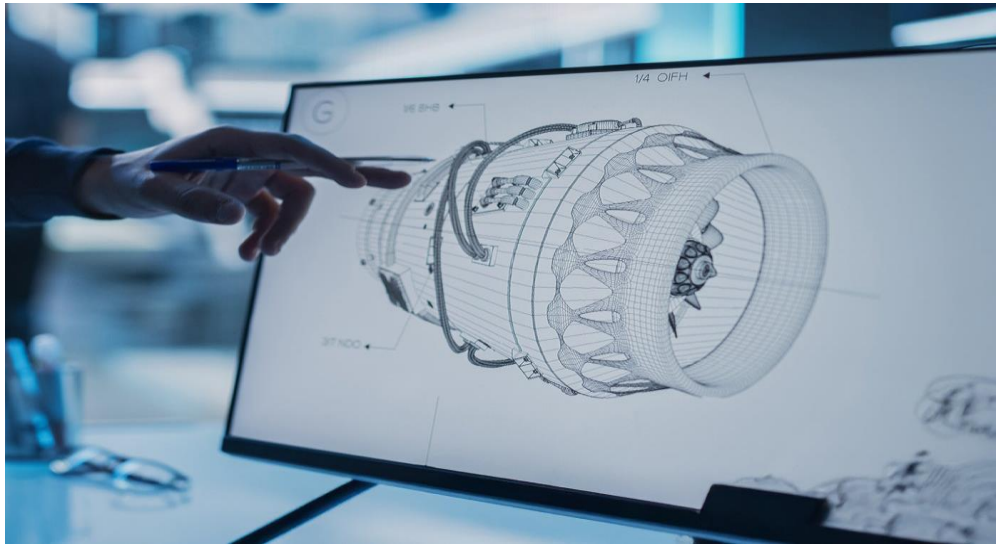
PPG ARE™ 3D Printed Sealants - *Precise*

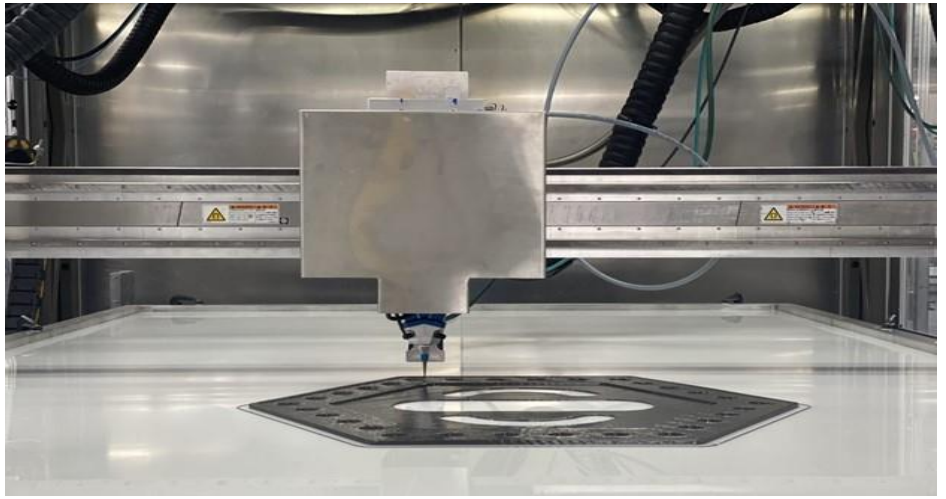
The Problem

Traditional hand-applied gaskets can be inconsistent due to changing labor, mixing issues or even lack of skill and may require rework.

The Solution

PPG ARE™ 3D Printed Sealants produce repeatable, precise, fully cured gaskets using our approved PPG sealants, producing consistent parts every time.





PPG ARE™ 3D Printed Sealants - *Fast*

The Problem

Slow traditional application methods, coupled with extended cure times mean long waiting periods or bottlenecks and can force delays for other work (running hydraulic or electrical lines, etc.)

The Solution

PPG ARE™ 3D Printed Sealants produce fully cured gaskets and can be used with fast setting adhesives to greatly shorten downtime.

PPG ARE™ 3D Printed Sealants – *Clean and Sustainable*

The Problem

Traditional hand-applied gaskets and seals require the mixing of multiple kits, can be messy and requires the disposal of chemical waste.

The Solution

PPG ARE™ 3D Printed Sealants require fewer cartridge kits and come to the customer fully cured, greatly reducing the mess and cartridge disposal associated with traditional application methods.

PPG ARE™ 3D Printed Sealants – *Shelf Life*

The Problem

Traditionally packaged sealants have a limited shelf life that includes transit and storage time, sometimes leading to expiring product.

Storage life

The storage life of PR-2001 Class B is at least 6 months when stored at temperatures between 60 °F (15 °C) and 80 °F (27 °C) in original, unopened containers.

The Solution

PPG ARE™ 3D Printed Sealants have an extremely long shelf life as they are received fully mixed and cured.

How PPG ARE™ 3D Printed Sealants Get into Production

Discovery

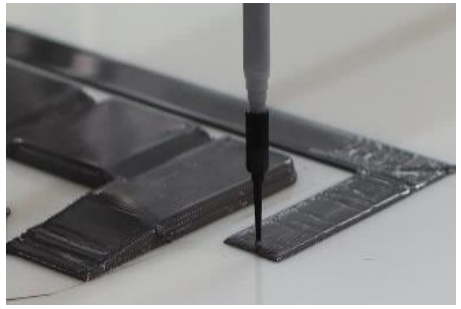
Identify Opportunities that Benefit from PPG ARE™ 3D Printing

CAD Design or Laser Scan

Part designs can be created from your CAD file or laser-scan of part

Part is Digitized & Optimized

Prototype Trial



✓ *Based on Fit Checks, CAD designs are altered and re-printed*

File is 3D Printed, Fit Check is Performed

Production Delivery

Once 3D printed parts are approved, part production becomes on-demand

Production is Automated, On-Demand Printing!

PPG ARE Team will be part of the entire process

The Value of PPG ARE™ 3D Printed Sealants

Pain Points		The PPG ARE Solution	
Time Consuming	• Hand-applied sealant applications over large areas • Multiple parts hand crafted, vary in design	**Reduced Production Time**	• Parts are supplied, ready for application • On-demand part production via ARE
Difficult Locations	• Tight crawl spaces • Areas of EH&S concerns • Difficult applications	**Reduced Handling**	• Faster application • Reduction in sealant handling • Limited waste
High Scrap / Rework	• Dimensionally critical • Often require rework / additional sealant	**Improved Parts + Less Rework**	• Improved part quality • Consistent part shape • Reduced rework by >80%

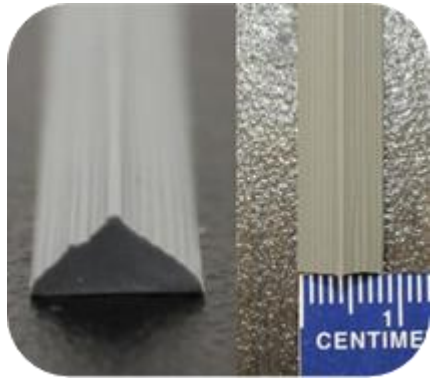
Joint Understanding of Your Process is Critical to ARE Product-Fit

Please feel free to contact our ARE™3D Printed Sealants team or your local PPG representative to explore potential innovative solutions for your specific application.

We protect and beautify the world®

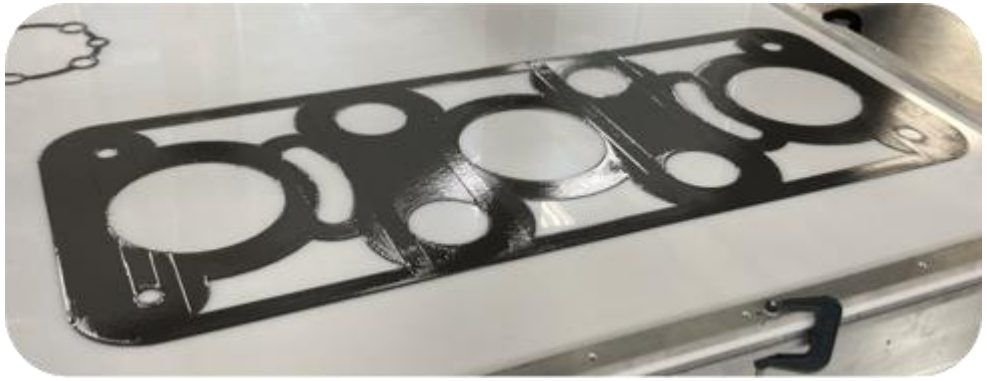
Typical Aerospace Applications

Gap Fillets



Smoothing Patches

Large Scale Fit-In-Place Gaskets



Fuel Panels

Flat Seals

Custom Seals

The Value of ARE for the Industry

Users can achieve reduced costs, improved productivity, and access to new innovations.

High-Quality Parts and Materials

3D printed parts are uniform, consistent, and durable– all produced with high-quality PPG Materials.

Improved Productivity

3D printed parts are fully cured and ready for quick installation – helping improve output and cost savings.

Improved-Time-to-Market

With access to fast and efficient part production, users can get to market faster and stay ahead of the competition.

Customized Solutions

With additive manufacturing, customers receive parts catered to their specific needs.

Increased Innovation

By working with PPG, you have access to the latest advancements in material science and technology solutions.

Sustainability

Reducing product waste and improving efficiency helps end users meet their own environmental goals.

Another great application innovation by PPG!