



INNOVATION. **PRECISION.** EXCELLENCE.

PRECISION PACKAGE: GASKETING & SEALING



TABLE OF CONTENTS

Gasketing and Sealing Applications 3

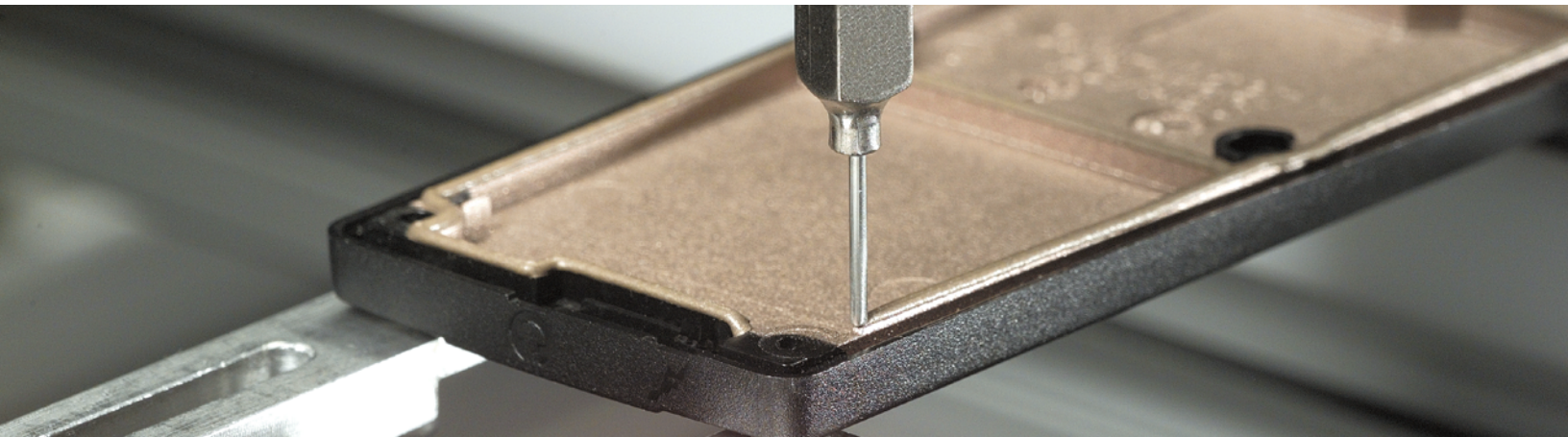
Defining Your Solution 4

Choosing Your Application Method 5-6

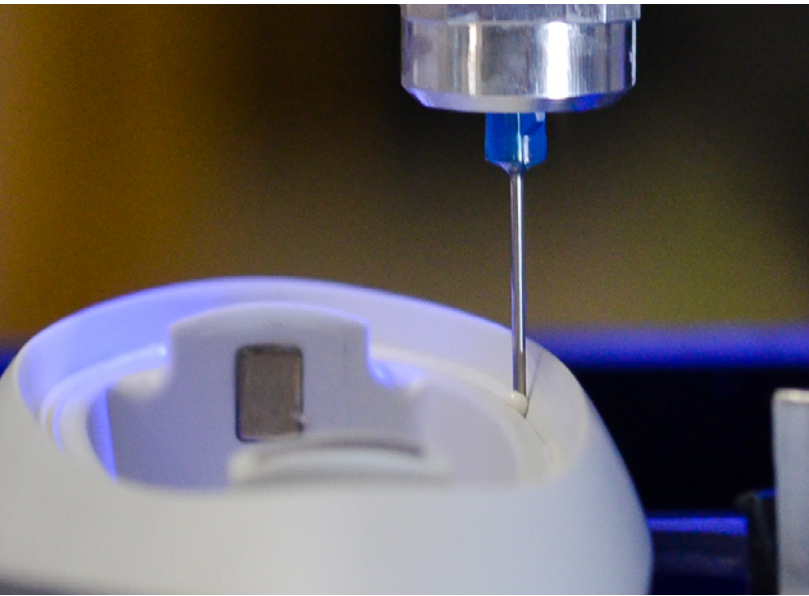
Defining Your Automation 7-8

Curing and Handling 9-10

Frequently Asked Questions 11



GASKETING & SEALING APPLICATIONS



Gasketing and sealing applications are used to prevent liquid and gases from leaking between mating parts.

While similar, for the purposes of applying a liquid or paste material to achieve the gasket or seal, we will refer to a gasket as a CIPG (cured in place gasket) and a seal as a FIPG (formed in place gasket).

With CIPG applications, the material is applied to one of the mating parts and cured. This allows the parts to be assembled at any stage of the process after the gasket has been

applied and cured. Additionally, it permits the parts to be disassembled and reassembled as needed. CIPG requires accurate material dispense so bead dimensions are held within tolerance including tolerances for the knit line (where the gasket starts/stops and overlaps).

With FIPG applications, the material is applied to one or both mating parts and the parts are assembled before the material cures. The accuracy of bead dimensions is not as critical, however, the amount of material does need to be controlled. Depending upon the materials selected, this method can allow for the seal to double as an adhesive thus reducing or eliminating the need for fasteners while also providing a tamper-proof feature. Due to this, the assembly cannot be disassembled in the future.

KEY MARKETS

- Aerospace and New Space
- Automotive, E-Mobility, and Transportation
- Military and Defense
- Renewable Energy
- Telecommunications and Connectivity

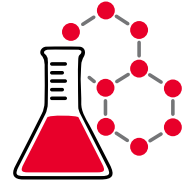
DEFINING YOUR SOLUTION

With the wide range of gasketing and sealing materials and equipment options available, your application may seem hard to define. Having answers to the key points listed below will help start the process of creating a solution in a reasonable time frame.

STEP 1: Understanding Material Properties and Chemistry

There are many types of chemistries and formulations that provide different properties and processing characteristics. Work with your material manufacturer along with equipment supplier to select a material that is right for your application and that provides a robust process to apply the material. Clearly define the requirements of the application. For example:

- Base chemistry
- Single or two component formulation
- Compression set (for CIPG applications)
- Viscosity
- Required cure schedule
- Pot or work life
- How the material is packaged/container size (cartridge, canpail, bladder bag, etc.)



STEP 2: Defining Gasket/Seal Requirements

Key requirements that an application must specify include:

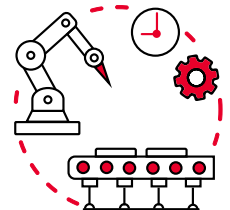
- Bead dimensions and allowable tolerance
- Bead location and tolerance
- Allowable knit line tolerance (CPIG)
- Knit line location - typically best near corners and/or where there is a fastener



STEP 3: Define the Automation Required

Will the process be manual, semi-automated, or fully automated? In addition to requirements identified in steps 1 and 2, the following questions need to be answered in order to define the required equipment:

- What is the production rate required (e.g. number of parts annually)?
- What is the duty cycle for the process (e.g., hours per day, days per week, weeks per year)?
- Takt time (determined by production rate and duty cycle)?
- Part dimensions?
- Part handling - will the process be manual load/unload or conveyorized?



ADDITIONAL CONSIDERATIONS

1. Carefully review material requirements and choose materials that meet the application requirements and provide a robust process that can be realistically employed.
2. Most manufacturing challenges can be eliminated by utilizing DFM (design for manufacturing) by working with your material supplier and equipment manufacturer early on in the process.

CHOOSING YOUR APPLICATION METHOD

Once your gasketing and sealing material and process requirements have been successfully defined, you will be able to choose your application method. Some of our most common valves for gasketing and sealing are shown below with optional features and additions where applicable. To learn more about each valve, scan the corresponding QR code. To inquire about a custom solution, please contact PVA at info@pva.net or 518-371-2684.



BP50

Controlled dispensing for 50 ml bi-pack cartridges for low to high viscosity fluids.

Viscosity
1 cps - paste



FC100-MC

Needle dispense valve that uses standard Luer Lock needles for detail or hard to reach areas. Capable to use with high pressure for dispensing gels and encapsulants.

Viscosity
1 cps - paste



SB300

High flow rate dispense valve with snuff back operation used with high viscosity adhesives for large dot or bead applications. Available with luer lock outlet or 1/4" NPT connection for custom nozzles.

Viscosity
50,000 cps - paste



PC100

Plural component mixing valve with a divorced valve design to prevent material contamination of the air body.

Viscosity
1 - 100,000 cps



PC150

Compact two part dispense valve for a wide viscosity of unfilled fluids with short pot life chemistries.

Viscosity
1 - 500,000 cps (unfilled)



PC200

Ideal for most two component bead or dot project and compatible with standard bell inlet disposable mixers.

Viscosity
1 - 500,000 cps



PCP

Featuring a machined rotor coupled with a rubberized seal to assure drip-free operation with a wide range of viscous chemistries.

Viscosity
1 - 500,000+ cps



PDP

Superior volumetric accuracy for your most demanding two-component dispensing applications.

Viscosity
1 - 500,000+ cps



SD100

Provides clean on/off control for dispensing directly from syringes.

Viscosity
1 cps - paste



Compatible Pump & Metering Options



Endurance

Bundles multiple dispensing and pumping technologies into one solution as a standalone or integrated option.

Ratio
1:1 to 15:1



SMR

Servo metering rod system for two component systems with abrasive fillers.

Ratio
Variable,
1:1 to 10:1



SGP

Servo precision gear pump for single or two component chemistries.

Ratio
1:1 to 15:1



DEFINING YOUR AUTOMATION

With an application method chosen, a benchtop or inline/batch automation method can be selected to complete your process. Scan the corresponding QR code to learn more about each system.

Benchtop Solutions



PVA350

A compact 3 axis robot ideal for entry level automation of a variety of coating and dispensing applications.

Work Area (1 Valve/Tool)

365 mm x 378 mm x 101 mm

Footprint

944.3 mm x 831.8 mm x 793.7 mm



Delta 8

Conceptualized for maximum flexibility, the Delta 8 features a robust overhead three-axis motion platform suitable for inline or batch operations.

Work Area (1 Valve/Tool)

621 mm x 595 mm x 100 mm

Footprint

1270 mm x 973 mm x 2222.6 mm



Delta 6

Designed with improved structural and gantry rigidity for higher acceleration, robustness, and easier access.

Work Area (1 Valve/Tool)

521 mm x 485 mm x 100 mm

Footprint

854 mm x 1170 mm x 2105 mm



Flex Cell

Designed to meet your specific application requirements. Available in standard to very large work areas and can be highly customized.

Work Area

Various, from 500 mm² - 1200 mm²

Footprint

Varies upon workcell



Inline/Batch Configuration Options

Number of Axes

3, 4, or 5

Head Tooling

Single or dual tool

Fluid Delivery

- Syringe
- Cartridge
- Pail
- Drum
- Bladder bag

Substrate Handling

- Edge chain conveyor
- Pin chain conveyor
- Flex fixture
- Tooling plate
- Single drawer
- Dual drawer

Vision

- Fiducial camera
- Programming camera

Software

- Barcode
- MES
- Hermes
- CFX

Additional Options

- Agitation
- Auto refill
- Black light
- Blower
- Flow monitor
- Needle calibration block
- Temperature control
- Vacuum degas

CURING AND HANDLING

Curing and handling options can easily be added to streamline your process. Scan the corresponding QR code to learn more about each system.

Curing Solutions



Spectra

With Fusion® UV lamps by Heraeus, the Spectra can initiate fast ultraviolet light polymerization of adhesives and coatings in an efficient inline process. Various beam widths are available to accommodate a wide range of substrate dimensions.

Working Width
50 mm to 500 mm

Footprint
1651 mm x 1066.8 mm x 1661.2 mm



DeltaTherm

Utilizing infrared panels, the DeltaTherm can efficiently cure adhesives and coatings in a controlled, heated environment. With its double-sided configuration, the DeltaTherm offers custom top and bottom heat profiling in each two-foot section. Optional humidity control feature is available for further control of moisture cure applications.

Working Width
50 mm to 500 mm

Footprint
Varies upon oven
4ft, 8ft, 12ft, and 16ft options available



Handling Solutions



Queue-S Transfer & Inspection Conveyor

Ideal for a wide range of part handling applications, the Queue-S transfer and inspection conveyor can optimize material flow between processes for either bare board assemblies or pallet fixtures.

Working Width
50 mm to 500 mm

Footprint
1046 mm x 1003 mm x 2022.9 mm



Curing and Handling Configuration Options

Conveyor Height

890 mm to 965 mm from floor (SMEMA)

Component Clearance

100 mm (4 in) maximum top and bottom
4.75 mm (0.187 in) in edge carrying (SMEMA)*

*Applicable for Queue Series

FREQUENTLY ASKED QUESTIONS

What are some common curing options for CIPG and FIPG?

Room temperature/ambient, heat, and UV are the most common cure methods which transform the liquid sealant into a gasket. Each curing method has affects on both production timelines and the gasket's final performance characteristics.

How do CIPG and FIPG compare to die-cut or extruded gaskets?

CIPG and FIPG gaskets excel in applications requiring complex geometries, miniaturization, and high precision. CIPG and FIPG eliminates material waste and reduces the amount of overall assembly steps since they are dispensed directly onto the housing compared to die-cut gaskets that require separate assembly. Additionally, CIPG and FIPG can be applied to extremely narrow surfaces that would otherwise be impossible.



What are some design considerations that should be incorporated in my application?

In order to maintain bead dimensions, maintain flat dispensing surfaces whenever possible, especially with CIPG applications. Minimize starts, stops, and T-spots in your dispensing path not only to improve quality but also to reduce costs. To ensure repeatability, try to maintain an width to height aspect ratio of 3:2. If a bead needs to have same height or be taller than the width, multiple passes will be required.

Leader in World Class Dispensing, Coating, and Custom Automation

PVA is a world class innovator of high quality, repeatable dispensing and conformal coating systems. We manufacture turnkey solutions that help our customers improve their competitiveness. We do that through engineering robust processes that introduce repeatable results that reduce waste, increase throughput, and lower manufacturing costs. Our flexibility is unmatched as each solution is customized to optimize your manufacturing goals.

Headquartered in Upstate New York, with regional sites stationed throughout North America, Europe, and Asia, all PVA Systems are backed by a 24-hour global service network.

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