



INNOVATION. **PRECISION.** EXCELLENCE.

PRECISION PACKAGE: POTTING



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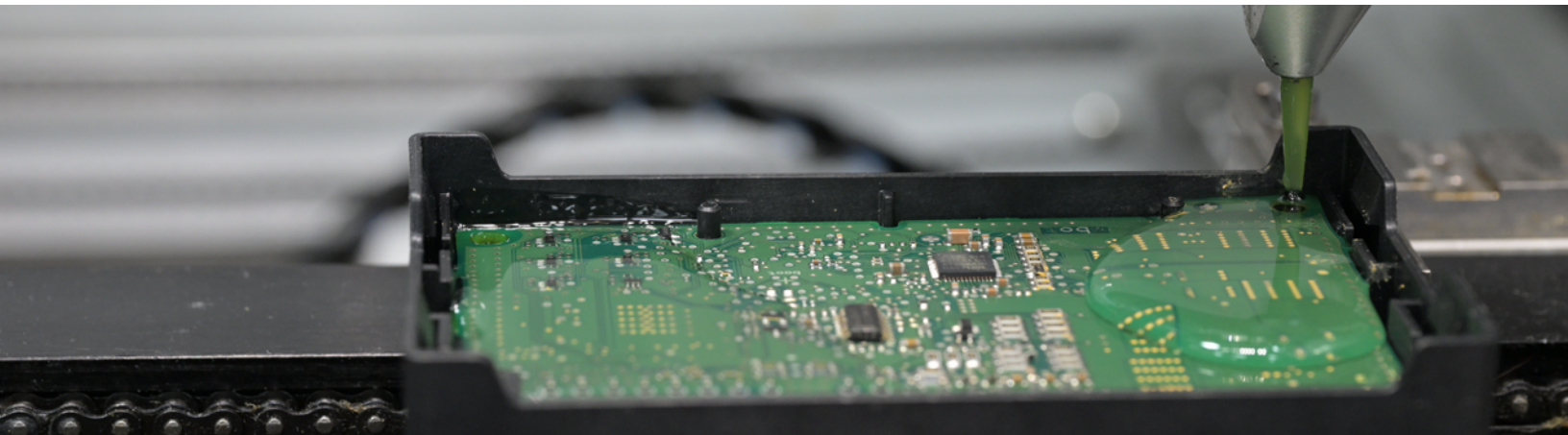
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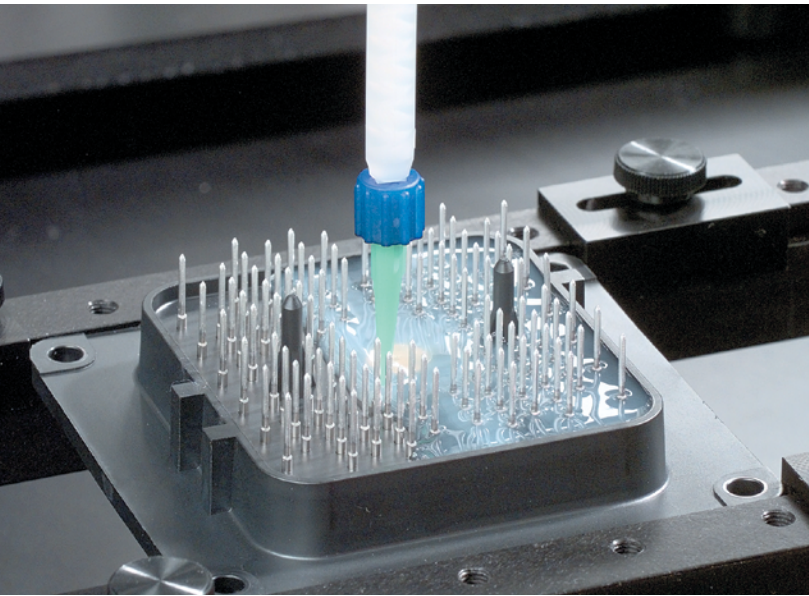
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POTTING APPLICATIONS



Potting is the process of filling an enclosure that holds electronic circuitry with a liquid which, when cured, completely encases a unit. Additional uses include sealing pins in through connectors.

Potting provides mechanical stability during shock and vibration as well as environmental protection from moisture and foreign objects.

Various potting materials are available to address conductivity, electrical and thermal isolation needs. Different potting compounds require different processing techniques and

may require mixing, specific temperatures, ways to eliminate bubbles, or even an additional curing step. For applications where there is very high voltage, a vacuum chamber may be required to ensure zero entrapped air.

Contact us for more information on equipment selection and options.

KEY INDUSTRIES

- Aerospace
- Automotive
- Defense
- Energy
- Industrial
- Telecommunications

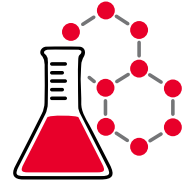
DEFINING YOUR SOLUTION

With the wide range of potting 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: Understand the Potting Material Chemistry

There are many types of potting chemistries and formulations that provide different properties and processing characteristics. Work with your material manufacturer to select a material that is right for your application. Some key properties are listed below:

- Base chemistry
- Single or two component formulation
- Thermal conductivity
- Viscosity
- Required cure schedule
- Pot or work life
- Required chemical resistance
- Fire resistance requirements
- How it will be supplied (cartridge, can, pail, bladder bag, etc.)
- Glass transition temperature
- Strength or abrasion resistance
- Repairability



STEP 2: Defining Potting Requirements

Clearly define the requirements of the potting application. For example:

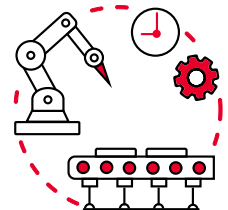
- Minimum and maximum fill areas
- Cycle time requirements
- Degassing requirements
- Material or part heating
- Keep out areas
- Areas that must be void free
- Pre-potting damming or sealing requirements



STEP 3: Define the Automation Required

Defining automation is driven by answers for Steps 1-3. For example:

- Can the part be filled in one location or does the application tip require potting to be applied or injected in several areas?
- Will the process be manual or automated?
- What is the required work area?
- What type of handling is needed?
 - » Manual load/unload or conveyorized?
- Are carrier pallets required?
- Are there any additional process control options needed (scales, data logging, etc.)?



ADDITIONAL CONSIDERATIONS

1. Carefully review material requirements and choose materials that meet the application requirements without over-specifying.
2. Pay attention to component design to eliminate filling issues and help reduce cycle time.
3. Work with both your material manufacturer and equipment supplier early on in the process
4. Do a cost analysis that includes the potting material, equipment, processing and maintenance requirements.
5. Utilize resources from your material and equipment suppliers to eliminate manufacturing issues.

CHOOSING YOUR APPLICATION METHOD

Once your potting material and process requirements have been successfully defined, you will be able to choose your application method. Some of our most common valves for potting 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



DX150

Servo driven dynamix mix valve for difficult to mix two part materials.



Viscosity
1 - 100,000 cps



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



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



SCTP

Servo cartridge pump for one or two component applications with configurations for 20 and 32 oz cartridges.



Ratio
1:1 to 10:1



SGP

Servo precision gear pump for single or two component chemistries.



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



SPP

Servo piston pump for dispensing of heavily filled and abrasive materials.



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



Sigma
Powerful benchtop robot with robust gantry. The Sigma allows for many of the same options available on our larger systems, but in a smaller footprint.



Work Area (1 Valve/Tool)
330 mm x 300 mm x 100 mm
Footprint
743 mm x 643 mm x 805 mm



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

Inline/Batch Solutions



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
Recirculation
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

How does potting differ from encapsulation?

Potting involves filling an enclosure with material which becomes part of the final process. Encapsulation, components are either dipped or placed in a mold. After the potting material is cured, the mold is removed.

What are the common causes of failure in potting compounds?

Some common causes of failure in potting compounds can include improper mixing of the resin and hardener components, improper dispensing, lack of surface preparation of the substrates, inadequate degassing procedure, incorrect material storage, and even improper curing methods of the materials.

How do potting resins differ from conformal coatings?

Both potting resins and conformal coatings can be used to protect electronic components. However, potting compounds provide the most complete protection with thicker and heavier layers for electronic components which makes them ideal for applications where high mechanical stresses or exposures to chemical or environmental factors, such as moisture, are present. Compared to this, conformal coatings provide a very thin, lightweight layer of protection on top of components.

What is degassing and why would this step be necessary?

There are two types of degassing. Degassing the material due to air entrapment or air introduced during container filling and/or agitation. This degassing is done prior to being applied to the part. The second type is where the part is either dispensed under a vacuum, or the part with potting material is placed in a vacuum after potting material is applied. Degassing is done to prevent unwanted voids or air bubbles present in the potting material. Very high voltage applications may require dispensing under a vacuum.



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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