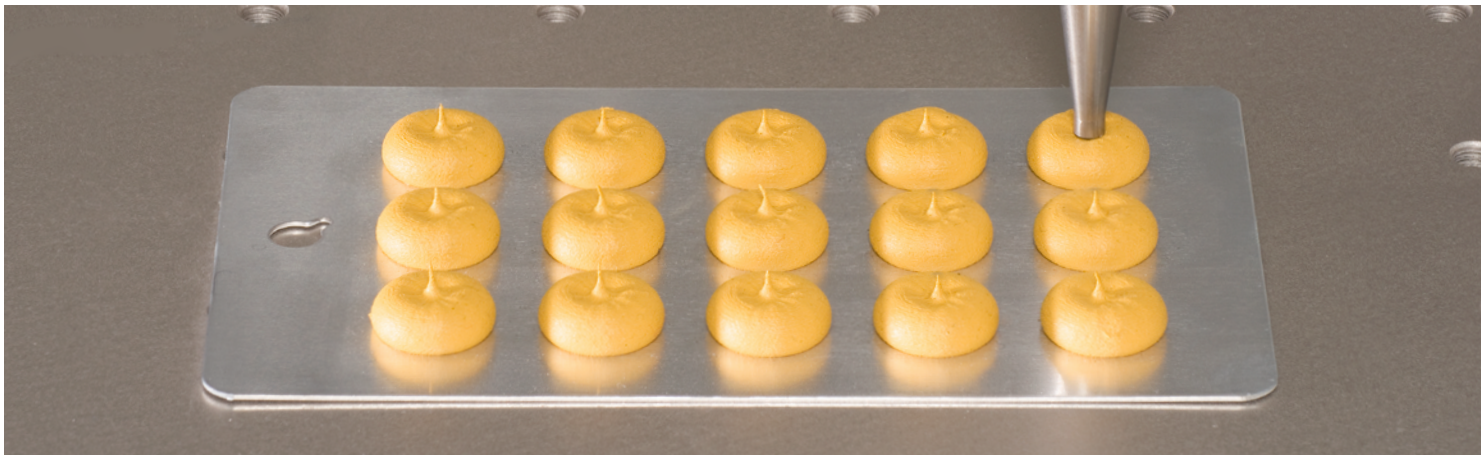
INNOVATION. PRECISION. EXCELLENCE.

PRECISION PACKAGE: THERMAL INTERFACE MATERIALS



REV - 10/2024

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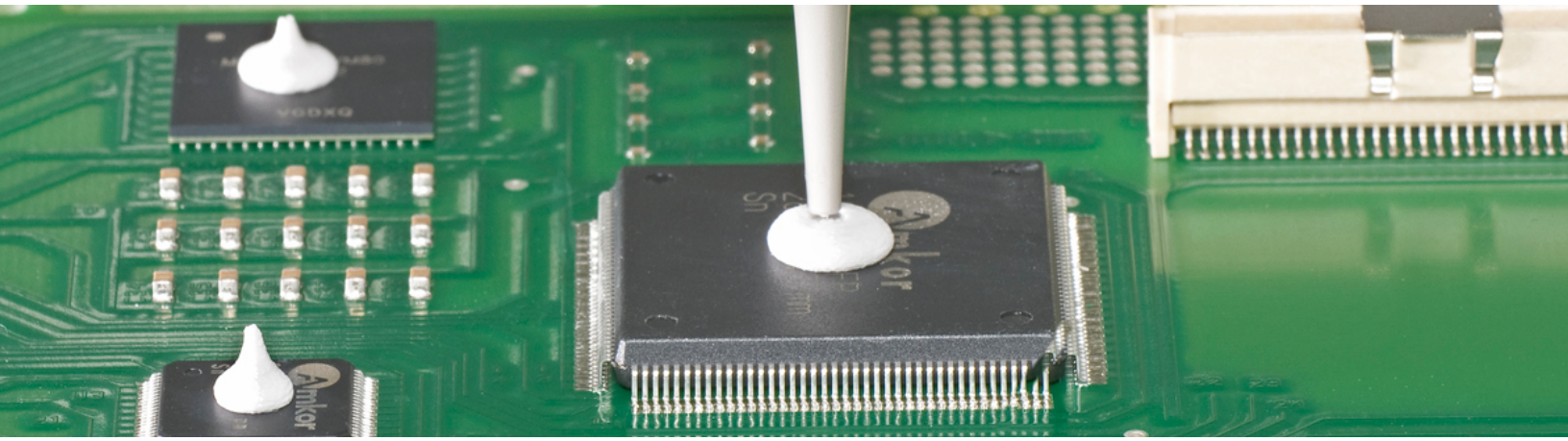
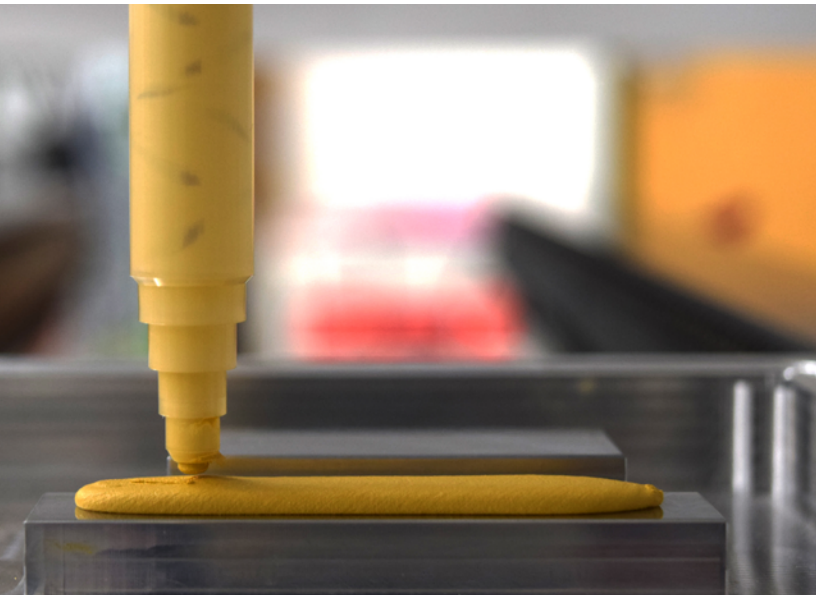


TIM APPLICATIONS



Thermal Interface Material (TIM) can be used to fill nano-sized imperfections caused by machining processes. Left untreated, these gaps can decrease thermal conductivity between two surfaces when only air is present.

A variety of dispensable liquid TIMs exist for aiding with heat transfer and relieving stress caused by coefficient of thermal expansion (CTE) mismatch. Thermal grease, gap fillers, dispensable "gels," and conductive potting are the most common forms of this technology. Thermal grease and semi-adhesive TIMs improve the reliability of integrated components and heat sinks.

The primary considerations when selecting a TIM are thermal conductivity and dielectric strength, but other features must be considered to establish a proper dispensing process such as viscosity, filler density, filler particle size, curing mechanism, and chemistry.

PVA offers a wide variety of solutions for dispensing TIM. Contact us for more information on equipment selection and options.

KEY INDUSTRIES

- Automotive
- Aerospace
- Aviation
- Consumer Electronics
- Military
- Telecommunications

View our white papers on Thermal Interface Materials:

The Benefits of Progressive Cavity Pumps in your Dispensing Process

Considerations for Dispensing Thermal Interface Materials

Advantages and Considerations for Dispensing Thermal Interface Materials

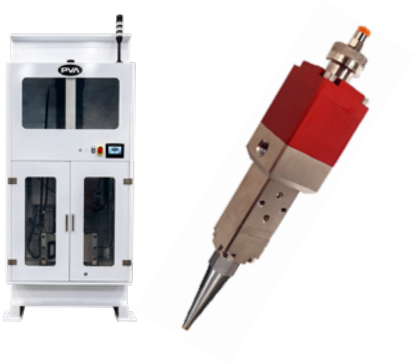
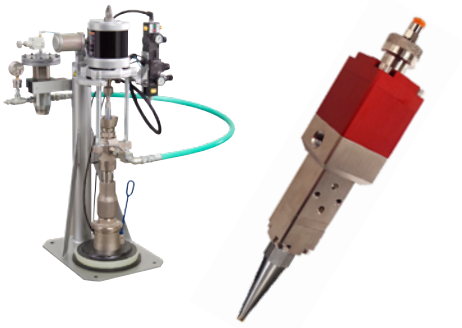
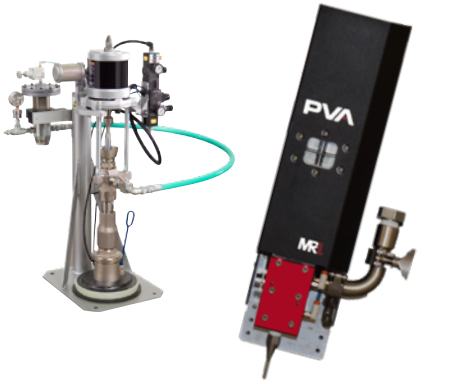
1-PART COMMON CONFIGURATIONS

Some of the most common 1-part product configurations included in our **Precision Package: Thermal Interface Materials** are shown below. For more information or to inquire about a custom solution, please contact PVA at info@pva.net or 518-371-2684.

Reservoir Size	Shot Size	Shot Accuracy*	PVA Dispenser
• 10, 30, or 55 cc syringe • 6 oz Semco™ cartridge • 310 cc cartridge	Small or Medium	10%	**SD100** *Syringe Dispense with Stopcock* 
• 10, 30, or 55 cc syringe • 6 oz Semco™ cartridge • 310 cc cartridge	Small or Medium	±1%	**PCP-C Series, syringe, or cartridge direct mount** 
• 1 gallon steel pail	Small to Large	5-10%	**1GPU + SB300-C/SB400-C** 

**Material Dependent*

1-PART COMMON CONFIGURATIONS (CONT'D)

Reservoir Size	Shot Size	Shot Accuracy*	PVA Dispenser
• 5 gallon steel pail	Small to Large	10%	**5GPU + SB300-C/SB400-C** 
• 5 gallon plastic or steel pail	Small or Large	10%	**5GPP Series Pail Pump + SB300-C/SB400-C** 
• 5 gallon plastic or steel pail	Medium to Large	3-5%	**5GPP Series Pail Pump + MR1** 

**Material Dependent*

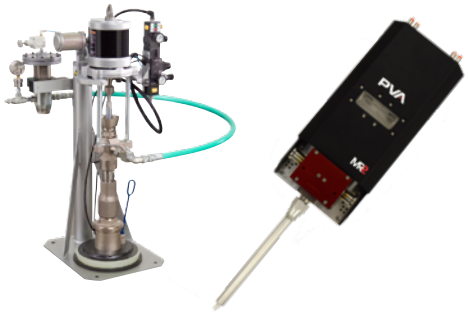
2-PART COMMON CONFIGURATIONS

Some of the most common 2-part product configurations included in our **Precision Package: Thermal Interface Materials** are shown below. For more information or to inquire about a custom solution, please contact PVA at info@pva.net or 518-371-2684.

Reservoir Size	Shot Size	Shot Accuracy*	PVA Dispenser
• 50 ml bi-pack	Small	10%	**BP50** *50ml Bi-Pack Dispenser with Stopcock* 
• 30 or 55 cc syringe • 6 oz Semco™ cartridge • 20 oz Semco™ cartridge	Small or Medium	±1%	**PDP-C Series, Syringe, or Cartridge Direct Mount**  
• 20 oz Semco™ cartridge	Small or Medium	3-5%	**Endurance, SCTP Pumps, or PC200-TCM** 

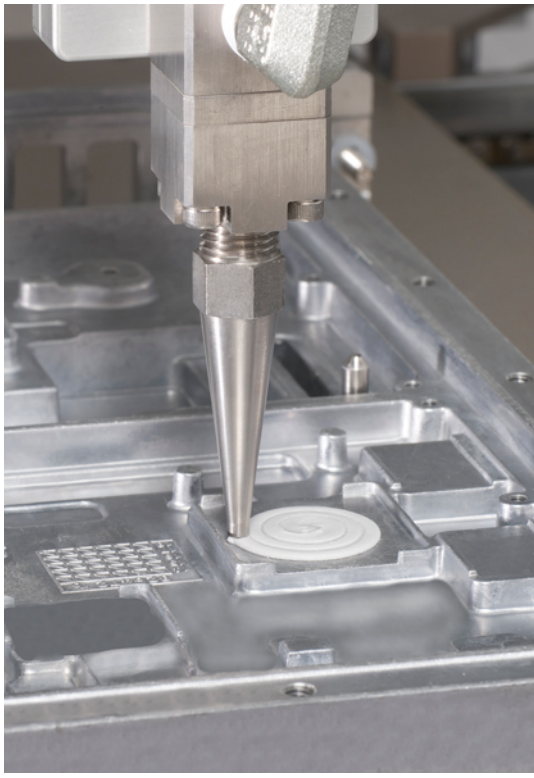
**Material Dependent*

2-PART COMMON CONFIGURATIONS (CONT'D)

Reservoir Size	Shot Size	Shot Accuracy*	PVA Dispenser
• 5 gallon pail	Small to Large	3-5%	**PVA-CPD20 to PDP-C Series** 
• 5 gallon pail	Medium to Large	3-5%	**5GPP Series Pail Pump to MR2** 

**Material Dependent*

FREQUENTLY ASKED QUESTIONS



What dispensing system should I use to process thermal interface materials?
Due to the viscous, heavily filled, highly abrasive nature of thermal interface materials, specialized equipment is required for transferring and dosing. Common dispensing solutions will often not withstand abrasive filler content and wear quickly bringing unreliable results to your dispensing process.

Piston, rod, and progressive cavity pumps work particularly well when processing thermal interface materials. Piston and rod pumps process materials by filling and displacing a cavity, providing true positive displacement. These options provide minimal contact with the chemistry and limits friction and shear during dispensing. This assures your process remains reliable while minimizing wear and tear on your equipment.

Progressive cavity pumps displace material with every rotation of a screw. This process produces limited shear and hardened materials can be utilized to help reduce equipment wear.

Depending on your budget and desired dosing accuracy, time and pressure solutions can be employed but regular maintenance of the system should be expected. PVA's application engineering team can walk you through all available options and recommend a solution that best fits your dispensing goals.

What is the appropriate dispensing pattern for my application?
There are numerous factors to consider when determining the ideal dispense pattern for your application. No one pattern is universally employed as each application is unique. PVA's application engineering team can work with you to suggest the least complex dispense pattern that will achieve your desired performance within your required cycle time.

How does bond line thickness affect thermal performance?
Typically, the lower the bond line, the shorter the length heat must travel to be removed from a heat generating source. A thin bond line is often preferred to reduce thermal resistance.

How do I choose the appropriate dispensing needle?
Your TIM material, required dispensing volume, and filler particle diameter are just a few of the factors that will go into determining the current needle in your application. At PVA we would generally recommend a needle inside diameter that is at least seven to ten times larger than the maximum particle size in the material. Anything smaller in ratio can run the risk of clogging as particulate attempts to flow through restricted openings.

PVA recommends tapered tip needles for the vast majority of TIM materials. Tapered tips reduce backpressure, promote flow, and produces precise, consistent deposits. Tapered tips also require less pressure on the TIM material, which is beneficial for filled chemistries as high pressure can cause filled materials to separate. PVA has both disposable and reusable steel high flow tapered tip needles to best match your application.

FEATURED PRODUCTS

To learn more about any product featured in this brochure, scan the corresponding QR code.

SB300-C

PC200-TCM

PCP-C SERIES

PDP-C SERIES

MR1

MR2

SCTP

1GPU

ENDURANCE

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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