About Graco

Founded in 1926, Graco is a world leader in fluid handling systems and components. Graco products move, measure, control, dispense and apply a wide range of fluids and viscous materials used in vehicle lubrication, commercial and industrial settings.

The company's success is based on its unwavering commitment to technical excellence, world-class manufacturing and unparalleled customer service. Working closely with qualified distributors, Graco offers systems, products and technology that set the quality standard in a wide range of fluid handling solutions, namely spray finishing, protective coating, paint circulation, lubrication, and dispensing sealants and adhesives, along with power application equipment for the contractor industry. Graco's ongoing investment in fluid management and control will continue to provide innovative solutions to a diverse global market.

Contact Graco

Mailing Address
P.O. Box 1441
Minneapolis, MN 55440-1441
Tel: 612-623-6000
Fax: 612-623-6777

United States

Minnesota
Worldwide Headquarters
Graco Inc.
88-11th Avenue N.E.
Minneapolis, MN 55413

Europe

Belgium
European Distribution
Center Graco Distribution BV
Industrieterrein-Oude Bunders
Slakweidestraat 31
3630 Maasmechelen, Belgium
Tel: 32 89 770 700
Fax: 32 89 770 777

Asia Pacific

Australia
Graco Australia Pty Ltd.
Suite 17, 2 Enterprise Drive
Bundoora, Victoria 3083
Australia
Tel: 61 3 9468 8500
Fax: 61 3 9468 8599

China (AP Headquarters)
Graco Fluid Equipment
(Shanghai) Co., Ltd.
Building 7, No.1-2,
Lane 299, Wenshui Road
Jing'an District, Shanghai
Postal code: 200436
Tel: 86 512 6260 5711
Fax: 86 21 649 50077

India
Graco India Pvt Ltd.
Plot No 295, Udyog Vihar Phase-IV
Gurugram - 122015 (Haryana)
India
Tel: 91 124 661 0200
Fax: 91 124 661 0201

Japan
Graco K.K.
1-27-12 Hayabuchi
Tsuzuki-ku
Yokohama City, Japan 2240025
Tel: 81 45 593 7300
Fax: 81 45 593 7301

Korea
Graco Korea Inc.
38, Samsung 1-ro 1-gil, Hwaseong-si, Gyeonggi-do. 18449 Republic of Korea
Tel: 82 31 8015 0961
Fax: 82 31 613 9801

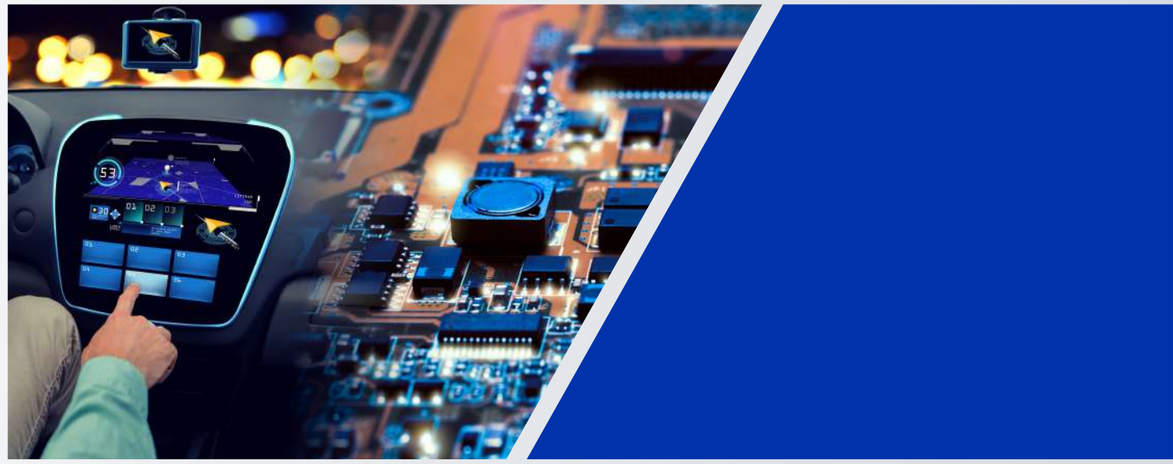
Sales/Distribution/Service

To learn more about our products or request a demonstration, please call

877-844-7226 or visit www.graco.com/electronics.

Graco inc. is registered to I.S.EN ISO 9001

Dispensing Solutions for **Automotive Electronics Assembly**



PROVEN QUALITY. LEADING TECHNOLOGY.

Electronics Drive the Future

Safe and Comfortable

Environmentally Friendly

Smart and Connected

The automotive industry is undergoing a revolution of innovation, in which electronics play a crucial part.

The automotive industry's electronic age started in the early 1950s, when the first electronic device (a valve receiver) became available in vehicles. More than half a century later, the amount and value of automotive electronics continues to increase significantly.

Driven by advancing technology and rising environmental concerns like carbon emissions, emerging electronic applications like these are making vehicles more intelligent and user-friendly, bringing greater comfort and safety:

- autonomous driving
- 5G cloud technology
- electric vehicle (EV) batteries
- smart car interconnectivity

Automotive functions rely on highly integrated and powerful electronics that must operate reliably and efficiently over longer times of use.

In the automotive revolution, electronics actively

drive innovation

Strong Bond With Automotive Electronics

Thermal Management

Bonding

Sealing

Potting

These manufacturing processes are key to ensuring the high performance and safety of automotive electronics.

- **Thermal management** allows electronic components to maintain an appropriate temperature to avoid malfunctions caused by overheating.
- **Bonding** reliably bonds electronic components to the printed circuit board (PCB) and improves overall structural strength.
- **Sealing and potting** protect electronic components from constant vibration, moisture, dust, extreme temperatures, and aggressive substances.

As you scale from prototype to production, you can count on Graco to get it right the first time. Our automotive and battery manufacturing experts have vast experience in some of the most challenging applications.

Advanced Dispensing Solutions Enable Automotive Electronics Assembly

Pg 6 Thermal Management
Pg 10 Bonding
Pg 14 Sealing
Pg 18 Potting

Highly integrated, high-performance electronics are an indispensable part of modern vehicles.

Graco brings extensive industry experience to automotive electronics assembly. Our customized dispensing solutions accurately and reliably deliver single-component and two-component materials - even highly abrasive thermal interface material (TIM) fillers.

Electronic Control Unit (ECU)

Thermal Management · Bonding · Sealing · Potting

One of the most important components in modern automotive electronics, the electronic control unit (ECU) acts as the brain of a vehicle. It monitors and processes the driving data transmitted by sensors and the operation status of the vehicle in real-time.

Displays & Intelligent Cockpit

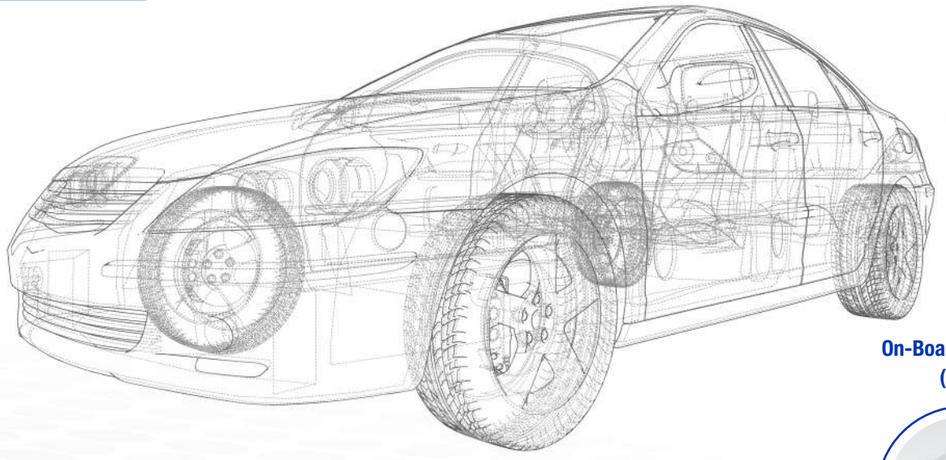
Thermal Management · Bonding · Sealing · Potting

Automotive displays vary greatly in design and application. This means manufacturers must keep the thermal conductivity of the circuit board, overall structural strength, and the integrity of the dashboard display in mind in the overall design and production.

Automotive Lights

Thermal Management · Bonding · Potting

Adaptive driving beam (ADB) headlights, adaptive front lighting systems (AFS), matrix LEDs (light-emitting diodes), and pixel-level image understanding for smart and autonomous vehicles are taking the electronization and intelligence of vehicle lights to the next level. In the process, high-strength sealing, bonding and potting applications have become indispensable



Electric Vehicle (EV) Motor

Bonding · Sealing · Potting

Electric drive systems are a fast-developing frontier for EV powertrains. E-drive systems require special sealing and bonding to resist dust, liquid, and other environmental factors that may affect the safe and efficient operation of the vehicle.

On-Board Charger (OBC)

Thermal Management · Sealing · Potting

The on-board charger (OBC) allows the battery to be charged anywhere AC power is available through the charging port of a private or public charging pile. The OBC must have ultra-high efficiency and reliability to ensure high-speed charging.

Automotive Radars & Sensors

Thermal Management · Bonding · Sealing · Potting

On-board sensors transmit the operating status of the engine, chassis and body to the electronic control unit (ECU). Together with on-board radars and vision systems, they collect environmental collect environmental data to inform driving behavior. Harsh operating conditions make structural strength, sealing, and potting protection extremely important.

Electric Vehicle Power Conversion System

Thermal Management · Sealing · Potting

To keep up with the increasing range of electric vehicles, power components are put under intense strain. The challenge is to reduce the size of inverters and AC/DC converters without affecting reliability and safety. To do this, efficient thermal management, sealing, and potting are key.

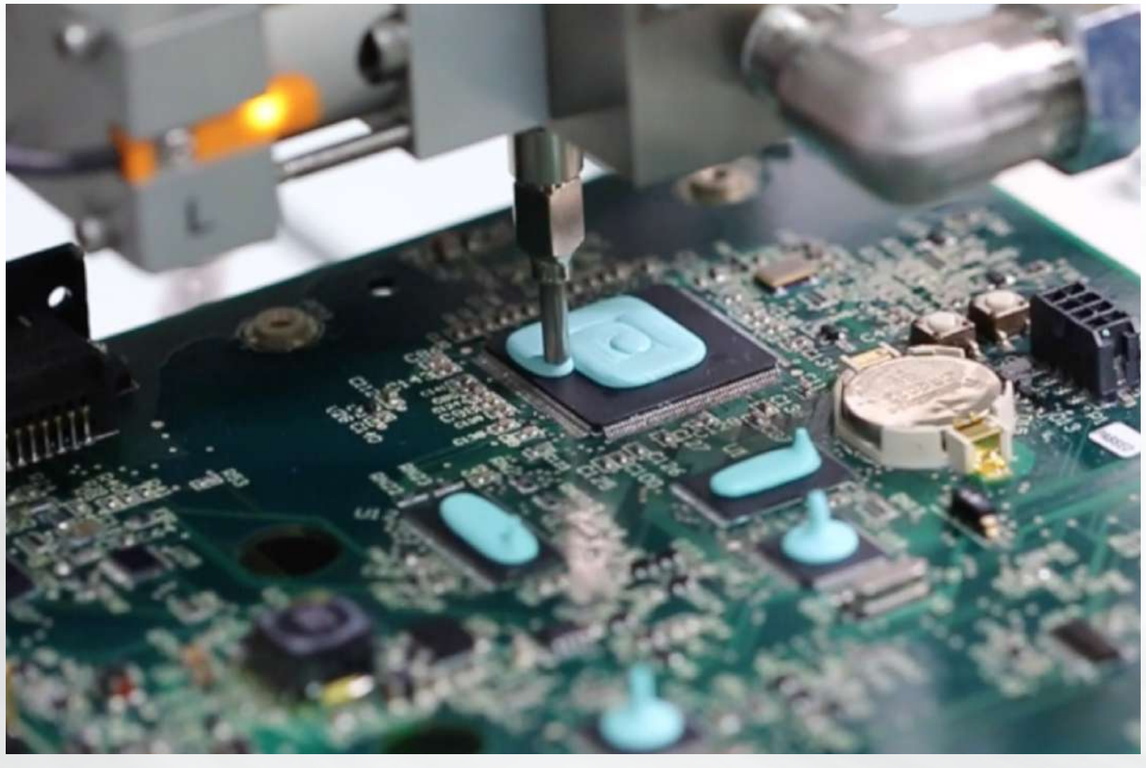
Dispense Solutions for Thermal Management

Application Introduction

Automotive electronics are increasingly characterized by high levels of integration and power density. which allows for a significant increase in electrical performance and meanwhile causes density. Thermal conductive adhesives for chips and thermal interface materials can efficiently dissipate the heat generated in electronic vehicles. This includes the battery management system (BMS), on-board charger (OBC), inverter, the electronic control unit (ECU), automotive display, and radar. Structural thermal paste also provides heat conduction and structural bonding in automotive lights.

Application Materials

Single-component and two-component liquid thermal interface materials (TIMs) are widely used in thermal management applications.



Dispensing Challenges

Thermal interface materials (TIMs) contain abrasive fillers and polyurethane or silicone-based substrates. Their high viscosity and abrasiveness challenge the longevity of any dispensing system.

High Maintenance Costs

The friction of hard fillers often causes equipment and systems to wear out. This can lead to material leakage, reduced dispensing accuracy, and high maintenance and replacement costs.

Frequent Maintenance Downtime

Downtime occurs frequently, due to maintenance and material clogging.

Unstable Supply

The high viscosity of TIMs easily causes fluctuations in the dispense volume.

Metering Accuracy Challenges

It is extremely difficult to control the accuracy of metering, mixing, and dispensing of high-viscosity TIMs, especially two-component materials.

Graco Innovation

Improved Durability

First-in-first-out fluid paths and wear-resistant coatings and construction greatly increase service life. Effectively sealed structural components also minimize maintenance and downtime.

Stable Supply

A high-pressure supply equipment design ensures long-term efficiency and stability when delivering high-viscosity TIMs.

High-Precision Metering

Advanced meters and progressive cavity pumps not only allow for accurate micro dispensing and high-flow dispensing, they also provide high-precision metering and proportioning of TIM joint fillers.

Overall System

The fluid path is optimized with more durable materials and coatings.

Pumps

High-pressure design increases capacity

Hoses

Components seal effectively

Metering Systems

Optimized fluid paths minimize dead spots

Dispense Valves

Wear-resistant construction increases accuracy and service life

Dispense Solution for Thermal Management

Single Component Dispensing

Meter and Dispense Systems

0.01-100 cc

Precision Shot Meter (PSM)
Lightweight Metering Dispense Valve

- Servo-driven motor and high-precision meter for accuracy and consistency in micro dispensing
- Compact, lightweight and easy to integrate
- Ultra wear-resistant materials and structure for dispensing abrasive thermal interface materials with minimum maintenance

0.03 cc - Continuous Flow

Progressive Cavity (PC) Pump

- Ideal for medium to high viscosity fluids
- Handles abrasive materials with ease
- Long service life
- Easy to maintain

Two Component Dispensing

Meter and Dispense System

0.03-100 cc

Posi-Ratio® Fixed & Variable (PR-X & PR-Xv)
Meter, Mix and Dispense Systems

- High precision and repeatability
- Wear resistant fluid path designed for dispensing highly viscous and abrasive materials
- Compact, lightweight, and easy to integrate into automated production lines

0.1 cc - Continuous Flow

EVR™ (Electric Variable Ratio)
Metering System

- Highly accurate, even with low flow rates
- Superior repeatability
- Capable of handling a wide range of materials
- Easy to configure, operate and maintain

up to 75 cc/s

Twin Control (TC) Valve

- Independent control of A/B fluid path for precise, repeatable dispense of two component epoxies, silicones, urethanes and thermal interface materials (TIMs)
- Modular design for different installation needs
- Material conservation through base purge function

Automated Dispense

Vertical Automation

Graco Smart Dispense (GSD)
Automation Platform

- Automated platform for inline or stand-alone adhesive dispense
- Comprehensive system with user-friendly interface and software
- Flexible workbench specifications, automatic and manual modes for changing production needs

Supply System

Cartridge to 1 Gallon Tank

DynaMite™
Supply Pump

- Compact design with a small footprint
- High wear resistance for extended service life
- Precise fluid delivery
- Built for harsh environments

> 5 Gallon Tank

E-Flo® SP
Electric Pump and Supply System

- Advanced material control
- Significant energy savings
- Quiet electric motor with no compressed air required
- Minimal downtime for maintenance

Check-Mate®
Pneumatic Pump and Supply System

- Ideal for medium to high viscosity materials
- Pressure ratio range of 5:1 to 85:1
- High quality, durable parts
- Trackable material usage and flow

This equipment is available with Elite construction. With wear-resistant seals and surfaces, Elite pumps and valves can withstand at least 10 times more abrasive material – thermal interface materials (TIMs), silicones, urethanes, and epoxies – than standard equipment.

Dispense Solutions for Bonding

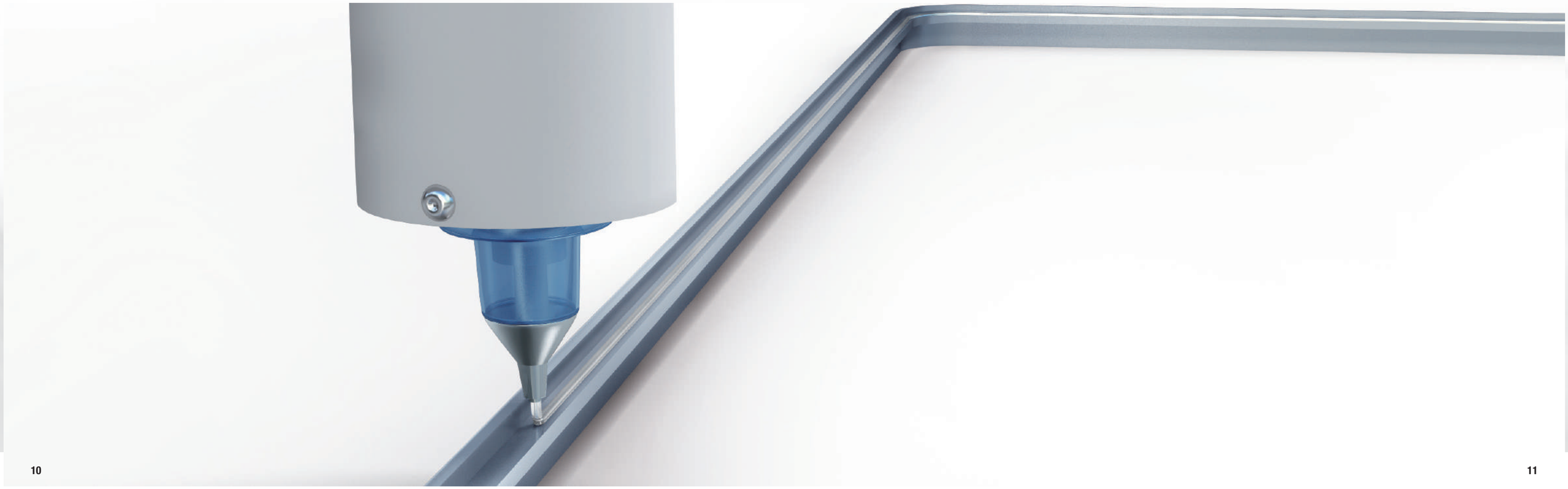
Application Introduction

In automotive manufacturing, bonding is replacing more conventional mechanical fastening methods involving riveting, welding and screwing. With the increasing demand for miniaturization and versatility in automotive electronics, automated dispensing systems must adapt to provide the desired sealing and conductivity to applications like these: magnetic steel bonding of motors, sealing bonding of lights, structural bonding of smart cabin displays, chip bonding of electronic control units and radars.

Application Materials

Single component or two component adhesives with different chemical compositions and functions include conductive adhesives, underfill adhesives, and structural adhesives (polyurethanes, silicones and epoxies).

Dispensing Challenges	Graco Innovation
High Precision Micro Bonding From the magnetic steel bonding of electric vehicle motors to structural bonding and chip bonding, dispense volumes are getting smaller and smaller. This requires automated dispensing systems to ensure precise metering and control of each component before mixing, as well as precise metering and dispensing after mixing.	**High Precision** A complete line of metering solutions provides industry-leading, high-precision metering and proportioning of single-component and two-component materials. **Flow Rate Adaptability** Whether it's micro-chip bonding or high-flow vehicle light sealing, electronic fixed ratio (EFR) system continuously meters and dispenses without priming, making reliable and fast dispensing possible.
High Viscosity Material Adhesives used for applications, such as structural bonding for automotive displays, are often high in viscosity. To meet assembly requirements, equipment must reliably mix, pump and metering this challenging material.	**Designed for Materials of Various Viscosities** Supply pumps designed for high pressure application ensure reliable supply and accurate metering for the delivery of low to high viscosity materials.



Dispense Solutions for Bonding

Single Component Dispensing

Meter and Dispense System

10 nL

Advanjet Jet Valve

- Ideal for handling low to medium viscosity materials
- Precise dispense, even over uneven and irregularly shaped surfaces
- Superior pattern capability to create micro-drops, lines or complex shapes
- Up to 300 drops/second with outstanding repeatability

0.002-3.6 cc

Dispensit® Dispense Valve

- Lightweight, compact and easy to integrate into automated equipment
- Simple valve design for easy maintenance
- Precise, repeatable shot-to-shot or bead dispensing

0.03-100 cc

Precision Shot Meter (PSM) Lightweight Metering Dispense Valve

- Servo-driven motor and high precision meter ensure high accuracy and consistency in micro dispensing
- Dispense volume adjustable for different applications
- Compact, lightweight and easy to integrate

Continuous Flow

iQ Dispense Valve

- Compact and lightweight body for high production applications
- Available in tip seal, snuff-back, or ball-seat models
- Easily customizable
- Durable design and components for extended service life

0.03 cc - Continuous Flow

Progressive Cavity (PC) Pump

- Ideal for medium to high viscosity fluids and abrasive materials
- Longer service life
- Easy to maintain

Two Component Dispensing

Meter and Dispense Systems

0.03-100 cc

Posi-Ratio® Fixed & Variable (PR-X & PR-Xv) Meter, Mix and Dispense Systems

- Ideal for two component sealant and adhesive applications
- High precision and repeatability
- Wear resistant fluid path designed for highly viscous and abrasive materials
- Compact, lightweight, and easy to integrate into automated production lines

0.1 cc - Continuous Flow

EVR™ (Electric Variable Ratio) Metering System

- Highly accurate, even with low flow rates
- Capable of shots, beads and continuous flow dispense
- Superior repeatability
- Easy to configure, operate and maintain

Mix and Dispense System

Static Mixing

MD2 Two-Component Mixing Dispense Valve

- Modular design adaptable to different installation needs
- Simple design with few parts for easy cleaning and service

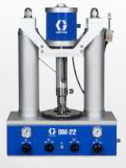
up to 75 cc/s

Twin Control (TC) Valve

- Independent control of A/B fluid path for precise, repeatable dispense of two component epoxies, silicones, urethanes and thermal interface materials (TIMs)
- Modular design for different installation needs
- Material conservation through base purge function

Supply System

Cartridge to 1 Gallon Tank



DynaMite Supply Pump

- Compact design with a small footprint
- High wear resistance for extended service life
- Highly precise fluid delivery
- Built for harsh environments

> 5 Gallon Tank

E-Flo SP Electric Pump and Supply System

- Advanced material control
- Significant energy savings
- Quiet electric motor with no compressed air required
- Minimal downtime for maintenance

Check-Mate Pneumatic Pump and Supply System

- Ideal for medium to high viscosity materials
- Available as a stand-alone unit or with elevator or ram
- Pressure ratio range of 5:1 to 85:1
- Trackable material usage and flow

This equipment is available with Elite construction. With wear-resistant seals and surfaces, Elite pumps and valves can withstand at least 10 times more abrasive material – thermal interface materials (TIMs), silicones, urethanes, and epoxies – than standard equipment.

Dispense Solutions for Sealing or Gasketing

Application Introduction

Sealing is the process of continuous bonding. In industrial manufacturing, sealants are commonly applied around a perimeter using cure-in-place gasketing (CIPG) or form-in-place gasketing (FIPG). Either method provides a continuous liquid sealing surface between the housing and the cover to prevent dust and moisture from entering the interior of the unit and damaging sensitive components or electronics. Sealants can often be found in electric vehicle motor end caps, battery management systems, on-board chargers, displays and other electronics covers.

Application Materials

Common electronic sealants include single component or two component silicones and polyurethanes, single component physical foaming materials, and two component mixed foaming materials.

Dispensing Challenges

The challenge in the material application is to maintain proper control over the dispense parameters to ensure consistent bead size and placement throughout the dispensing process. The spacing or size of the beads affect the sealing performance.

CIPG

Cure-In-Place Gasketing

The materials will be made into compression gaskets. Therefore, applying uniform beads with a suitable dispensing path is the key.

FIPG

Form-In-Place Gasketing

High precision dispensing while avoiding over-applying is crucial for high quality seals.

Two Component Foam Seal

High quality foam sealing relies on the thorough mixing of high viscosity paste and thixotropic glue.

Graco Innovation

Bead Control

Dispensing path technology controls bead size, placement and repeatability.

Stable Supply

Supply equipment designed for high pressure application ensures long-term efficiency and stability, even with high-viscosity thermal interface materials.

Efficient Mixing

Dynamic mix valve efficiently and thoroughly combines difficult material.

Dispense Solutions for Sealing/Gasketing

Single Component Dispensing

Meter and Dispense System

0.002-3.6 cc

Dispensit
Dispense Valve

- Lightweight, compact and easy to integrate into automated equipment
- Simple valve design for easy maintenance
- For precise, repeatable shot-to-shot or bead dispensing

0.03-100 cc

Precision Shot Meter (PSM)
Lightweight Metering Dispense Valve

- Servo-driven motor and high precision meter for accuracy and consistency in micro dispensing
- Dispense volume adjustable for different applications
- Compact, lightweight and easy to integrate

Continuous Flow

iQ Dispense Valve ELITE CONSTRUCTION

- Compact and lightweight body for high production applications
- Available in tip seal, snuff-back, or ball-seat models
- Easily customizable to your application with a variety of options

0.03 cc - Continuous Flow

Progressive Cavity (PC) Pump

- Ideal for medium to high viscosity fluids abrasive materials
- Long service life
- Easy to maintain

Automated Meter and Dispense System

High Flow/Continuous Flow

E-Flo iQ ELITE CONSTRUCTION

- Tank-to-tip solution that delivers consistent control
- Servo-driven motor for metering directly from the tank without external metering device
- Quiet electric motor with low energy consumption
- Scalable for polyurethane applications

Two Component Dispensing

Meter and Dispense System

0.005-5 cc

PD44
Meter, Mix and Dispense Valve

- For accurate dispense of two-component epoxies, polyurethanes, silicones and reactive resins
- Materials remain isolated before being injected into the static mixer
- Rod positive displacement metering
- Precise mix ratio and shot repeatability

0.03-100 cc

Posi-Ratio® Fixed & Variable (PR-X & PR-Xv) Meter, Mix and Dispense Systems

- High precision and repeatability
- Ideal for two-component sealants, adhesives, and highly viscous materials
- Compact, lightweight, and easy to integrate into automated production lines

0.1 cc - Continuous Flow

EVR™ (Electric Variable Ratio) Metering System ELITE CONSTRUCTION

- Highly accurate, even with low flow rates
- Capable of shots, beads and continuous flow dispense of a wide range of material
- Superior repeatability
- Easy to configure, operate and maintain

Mix and Dispense System

Static Mixing

MD2
Mixing Dispense Valve ELITE CONSTRUCTION

- For accurate dispense and mixing of sealants and adhesives
- Easy to maintain and service
- Modular design adaptable to different installation needs

Dynamic Mixing

Voltex™
Dynamic Mix Valve

- Ideal for mixing and dispensing two-component polyurethanes and silicones
- Rugged components engineered to reduce foaming material challenges and maintenance downtime
- RPM controlled by servo electric motor for consistent material mixing and dispensing

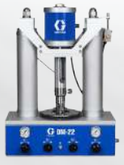
up to 75 cc/s

Twin Control (TC) Valve

- Independent control of A/B fluid path for precise, repeatable dispense of two component epoxies, silicones, urethanes and thermal interface materials (TIMs)
- Modular design for different installation needs
- Material conservation through base purge function

Supply System

Cartridge to 1 Gallon Tank



DynaMite
Supply Pump

- Compact design with a small footprint
- High wear resistance for extended service life
- Highly precise fluid delivery
- Built for harsh environments

> 5 Gallon Tank

E-Flo SP
Electric Pump and Supply System ELITE CONSTRUCTION

- Advanced material control
- Significant energy savings
- Quiet electric motor with no compressed air required
- Minimized downtime for maintenance

Check-Mate
Pneumatic Pump and Supply System ELITE CONSTRUCTION

- Ideal for medium to high viscosity materials
- Available as a stand-alone unit or with elevator or ram
- Pressure ratio range of 5:1 to 85:1
- Minimizes left-over materials and reduces waste
- High-quality, durable parts
- Tracks material usage and flow

ELITE CONSTRUCTION

This equipment is available with Elite construction. With wear-resistant seals and surfaces, Elite pumps and valves can withstand at least 10 times more abrasive material – thermal interface materials (TIMs), silicones, urethanes, and epoxies – than standard equipment.

Dispense Solutions for Potting

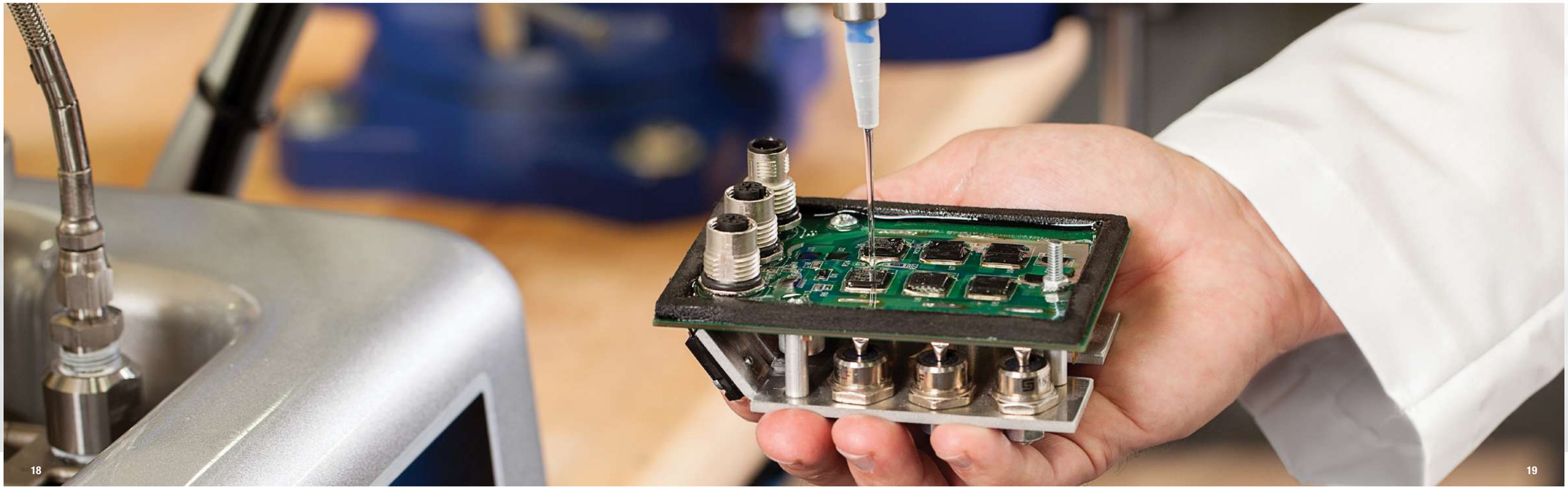
Application Introduction

Potting is the process of filling a complete electronic assembly with compounds for full protection of the assembly. It allows for better resistance to vibration and shock, improves the overall reliability, and avoids direct exposure of components and lines to water and moisture. Micro potting and thermal potting are often used to assemble automotive electronics, such as the on-board charger (OBC), the electronic control unit (ECU), and charging gun. Potting technology enables efficient production with automated dispensing equipment.

Application Materials

Single component or two component silicones and polyurethanes are commonly used in potting processes for automotive electronics.

Dispensing Challenges	Graco Innovation
Bubbles Materials often develop bubbles while being dispensed, resulting in compromised potting quality and reliability.	**Vacuuming and Agitation** Developed during years of experience, unique potting and filling processes effectively remove bubbles from materials as they are dispensed.
Micro Potting Accuracy Micro potting requires exact mixing and dispense. However, gear pumps and meters that supply potting material often have accuracy and leakage problems.	**High Precision** Piston pumps and meters provide precise proportioning and dispensing for typical and micro potting applications, ensuring great quality and yield.
Thermal Potting Service Live As they flow through supply, metering and dispense systems, abrasive thermal fillers can easily wear out equipment, drastically reducing service life.	**Wear Resistance** Smooth fluid path design and wear-resistant coating in supply pumps, meters and dispense valves increase equipment service life.



Dispense Solutions for Potting

Single Component Dispensing

Meter and Dispense System

0.002-3.6 cc

Dispensit
Dispense Valve

- Lightweight, compact and easy to integrate into automated equipment
- Simple valve design for easy maintenance
- For precise, repeatable shot-to-shot or bead dispensing

0.01-100 cc

Precision Shot Meter (PSM)
Lightweight Metering Dispense Valve

- Servo-driven motor and high precision meter for accuracy and consistency in micro dispensing
- Dispense volume adjustable for different applications
- Compact, lightweight and easy to integrate

Continuous Flow

iQ Dispense Valve

- Compact and lightweight body for high production applications
- Available in tip seal, snuff-back, or ball-seat models
- Easily customizable to your application with a variety of options

0.03 cc - Continuous Flow

Progressive Cavity (PC) Pump

- Ideal for medium to high viscosity fluids
- Longer service life
- Easy to maintain

Supply System

Cartridge to 1 Gallon Tank

DynaMite
Supply Pump

- Compact design with a small footprint
- High wear resistance for extended service life
- Highly precise fluid delivery
- Built for harsh environments

> 5 Gallon Tank

E-Flo SP
Electric Pump and Supply System

- Improved process and system performance
- Advanced material control
- Significant energy savings
- Extremely quiet motor with no compressed air required
- Minimized downtime
- Lower maintenance costs

Check-Mate
Pneumatic Pump and Supply System

- Ideal for medium to high viscosity materials
- Available as a stand-alone unit or with elevator or ram
- Pressure ratio range of 5:1 to 85:1
- Minimizes left-over materials and reduces waste
- High-quality, durable parts
- Tracks material usage and flow

This equipment is available with Elite construction. With wear-resistant seals and surfaces, Elite pumps and valves can withstand at least 10 times more abrasive material – thermal interface materials (TIMs), silicones, urethanes, and epoxies – than standard equipment.

Two Component Dispensing

Meter and Dispense Systems

0.005-5 cc

PD44
Meter, Mix and Dispense Valve

- For accurate dispense of two-component epoxies, polyurethanes, silicones and reactive resins
- Materials remain isolated before being injected into the static mixer
- Rod positive displacement metering
- Precise mix ratio and shot repeatability

0.03-100 cc

Posi-Ratio® Fixed & Variable
(PR-X & PR-Xv) Meter, Mix and Dispense Systems

- High precision and repeatability
- Ideal for two-component sealants, adhesives, and highly viscous materials
- Compact, lightweight, and easy to integrate into automated production lines

0.1 cc - Continuous Flow

EVR™ (Electric Variable Ratio) Metering System

- Highly accurate, even with low flow rates
- Capable of shots, beads and continuous flow dispense of a wide range of material
- Superior repeatability
- Easy to configure, operate and maintain

Mix and Dispense System

Static Mixing

MD2
Mixing Dispense Valve

- For accurate dispense and mixing of sealants and adhesives
- Easy to maintain and service
- Modular design adaptable to different installation needs

Dynamic Mixing

Voltex
Dynamic Mix Valve

- Ideal for mixing and dispensing two-component polyurethanes and silicones
- Rugged components engineered to reduce foaming material challenges and maintenance downtime
- RPM controlled by servo electric motor for consistent material mixing and dispensing

up to 75 cc/s

Twin Control (TC) Valve

- Independent control of A/B fluid path for precise, repeatable dispense of two component epoxies, silicones, urethanes and thermal interface materials (TIMs)
- Modular design for different installation needs
- Material conservation through base purge function

Graco Innovation

We are committed to providing end-to-end services in local markets.
With a global presence, we offer customers industry-leading products and localized research and development (R&D), production and services.

- R&D centers
- Labs
- Manufacturing sites
- Sales and engineering service teams
- Warehouses

NAIC

North American Innovation Center — **North Canton, Ohio, USA**

APIC

Asia Pacific Headquarters Asia Pacific Innovation Center — **Shanghai, China**

EUIC

EMEA Headquarters — **Massmechlen, Belgium**
European Innovation Center — **Aachen, Germany**

SCIC

Southern China Innovation Center — **Dongguan, China**

What We Offer

Customization

We have rich experience in evaluating materials and adapting equipment to find the most suitable solution. If our standard systems and equipment fail to meet your needs, we can design and build a solution just for you.

Online & Offline Training

From theory to practice, from basic operations to advanced topics, all our training courses can be customized to your specific needs.

Development & Test

We understand that the test equipment and materials matter a lot in the product development process. Our high-performance testing and development facilities are here for you.

Technical Support

Innovation requires teamwork and Graco is the partner you can rely on. We work closely with innovators to address the challenges in various industries. Our products and expertise are ready to help you navigate the upcoming challenges.