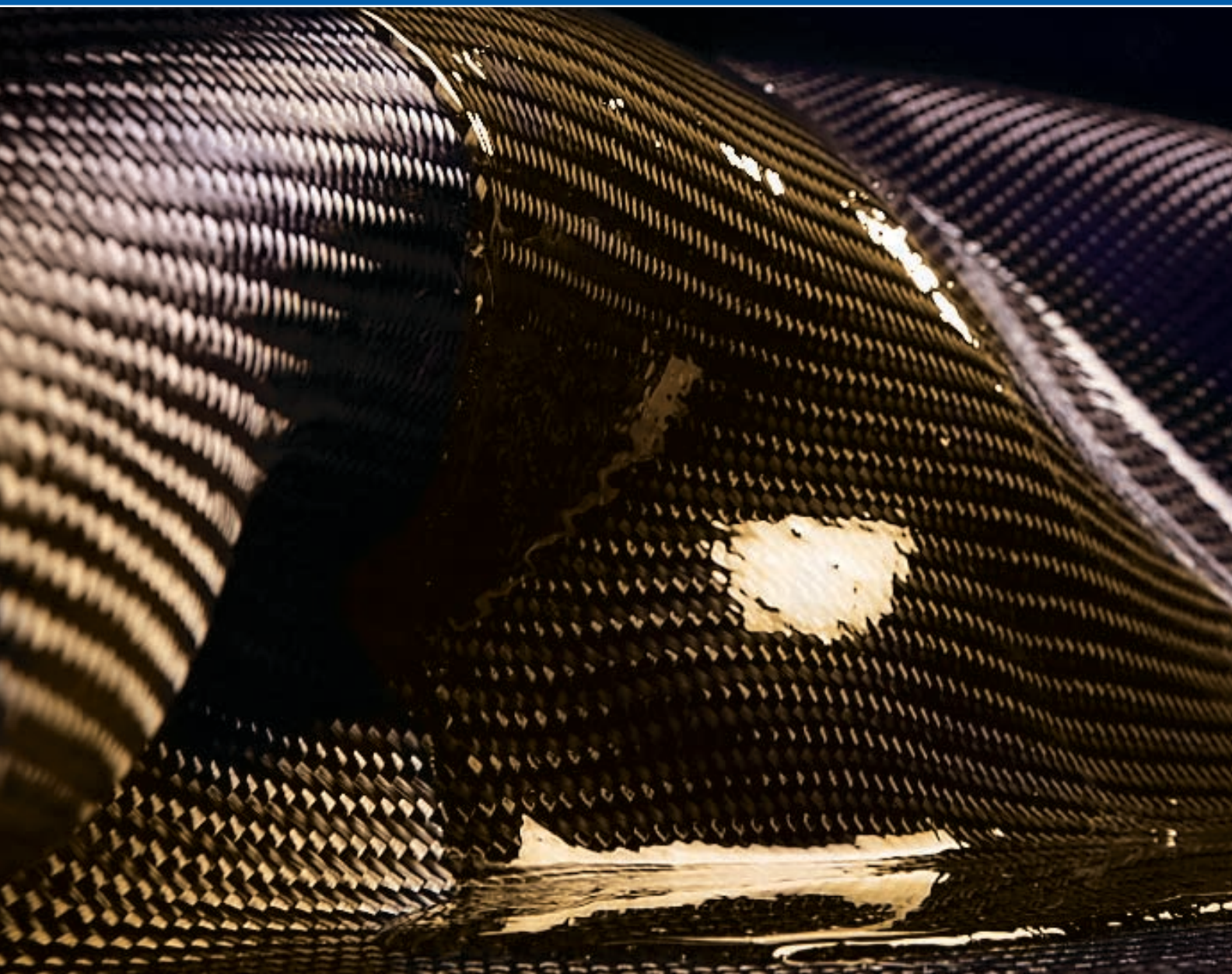




# Advanced Composites

Resin Pumping and Metering Solutions



PROVEN QUALITY. LEADING TECHNOLOGY.

## Precision Fluid Handling Technology for Advanced Composites



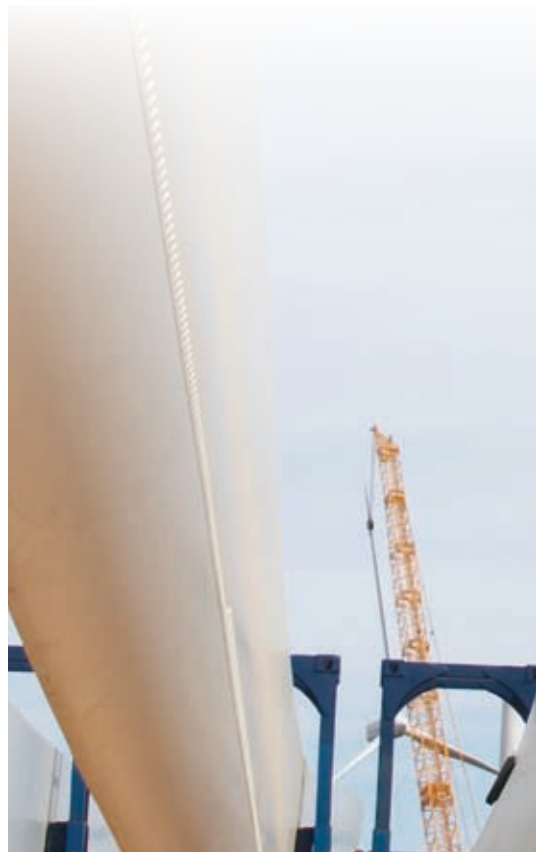
### Innovative fluid handling solutions that build your bottom line

Demand for advanced composites is growing on a global scale as these innovative materials are designed into an ever-increasing array of structures. Fuel conservation and performance drive the need for lighter weight aircraft and transportation vehicles. Alternative energy is pushing the limits on composite scale by requiring “super-sized” turbines. Corrosion resistance and cost reduction are primary considerations in storage tanks, pressure vessels and bridge construction.

These are only a few examples of where expensive, manual, slow resin dispensing processes of the past can limit today's new capacity needs and performance specifications. By integrating Graco® resin dispensing technologies into your manufacturing process, you will meet the demand for more composites, fabricated at higher speeds and at a lower cost.

Graco understands automated resin processes and provides the products, engineering and global support you need to manufacture advanced composites. Graco's heavy investment in research and engineering provides you with the innovations and technologies to:

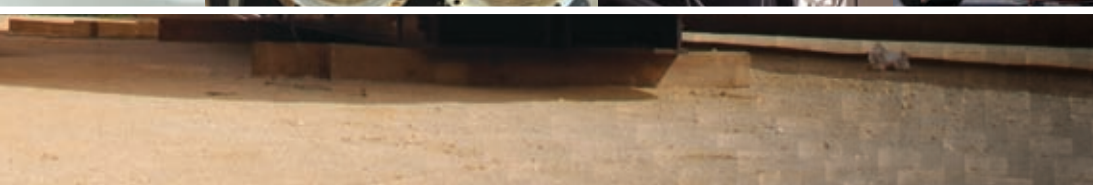
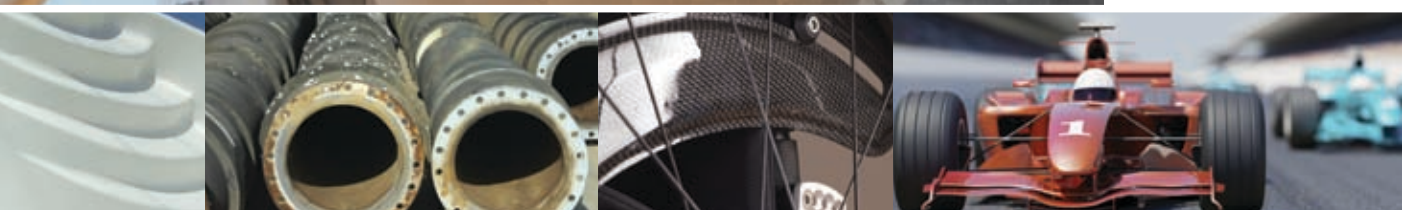
- Reduce cycle time
- Improve yield
- Limit hand touch labor
- Reduce scrap
- Reduce cleaning time

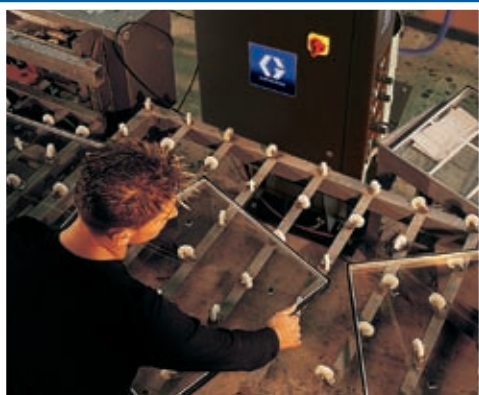




## With Graco, you can expect:

- Expanded capacity with large-scale, high-volume dispensing capabilities
- Faster cycle times - materials are dispensed faster and more consistently, saving time and material, and maximizing productivity
- Higher yield and less material waste with advanced, accurate control systems
- Out-of-autoclave close mold processing using resin injection technology
- Durability for reduced cost of ownership and faster return on investment
- Global support to ensure manufacturing readiness
- Reliability that maximizes uptime





# Dispensing Equipment for Advanced Composites Applications

## Complete solutions

From precursors to prepreg to final assembly, Graco offers complete solutions for moving, dispensing, and applying fluids in all phases of composites manufacturing.



### Precision Flow Control & Resin Pumping for Blending Processes

Prepreg Premixes  
Sheet Molding Compounding  
Auto Weight Control for Preblends

### Continuous Meter-Mix Supply

Pultrusion  
Filament Wind  
Prepregs

### Molding Processes

Infusion  
RTM Hand Lay Up  
Injection Molding

### Tooling Fabrication

Direct Paste Apply  
Hand Lay Up

### Assembly Processes

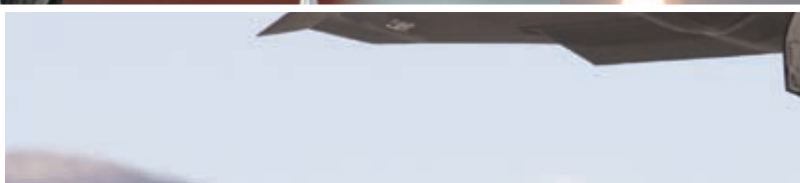
Adhesive Dispensing  
Structural Foam Injection

### Prepreg Manufacturing

Ambient Resin Feed  
Hot Melt Resin Feed

## Graco DC12 and PosiRatio® High-Volume Metering Systems

- Dispenses tooling paste, adhesives and resin
- Delivers up to 12 kg (26 lb) per minute – for faster processing
- Repeatable on-ratio dispensing – reduces material waste and re-work
- Optional ratio and flow rate monitoring with data collection for quality assurance



## Graco Supply System

- Delivers one-component resins, adhesives and other materials from drums or pails to metering and dispense systems
- Integrated air controls offer easy-to-see, easy-to-use controls
- NXT™ Air Motor, Check-Mate® and Dura-Flo™ technologies set the industry standard for durability
- Shared and common parts provide low carrying costs, even when multiple configurations are used

## Graco DL High-Volume Meter, Mix & Dispense System

- Independently driven rotary metering pumps or piston pumps
- Delivers accurate continuous material flow and shot dispensing as well
- Delivers up to 100 cc's per second at 1:1
- Variable ratios from 1:1 to 30:1 let you handle more materials
- Available with static, disposable dynamic or standard dynamic mixers
- Operator actuated or integrated with machine automation



## Graco Therm-O-Flow® and Warm Melt Systems

- Delivers hot or warm melt materials to metering and dispensing systems
- Therm-O-Flow's Mega-Flo™ platen offers industry leading melt rates for greater production capacity
- Temperature setback conserves energy during production breaks and prevents material charring

## Graco PR70 Meter, Mix & Dispense System

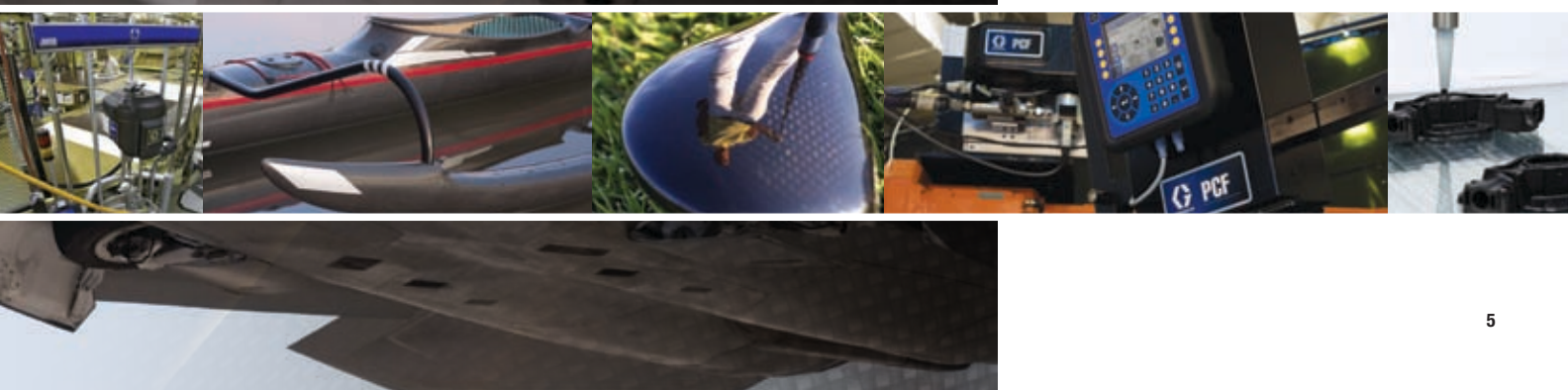
- Benchtop unit provides precise mix ratio and shot repeatability
- Exceptional performance with material ratios from 1:1 to 24:1
- Dispenses water thin to paste consistency materials from 2.0 to 70 cc's
- Available in fixed or variable ratio configurations
- Operator actuated or integrated with machine automation

## Graco PCF Metering System

- Dispenses a precise, continuous flow of single component resins or adhesives
- Closed-loop technology provides real-time flow and batch control
- Superior flow control reduces material waste
- Low cost of ownership, fewer wear parts for easy maintenance

## Graco HFR Metering System

- Hydraulic fixed ratio metering system
- Processes multiple materials from rigid and flexible polyurethanes to elastomers and epoxies
- Delivers accurate ratio and volume
- Automatically adjusts to achieve consistent material flow or pressure
- Modular design lets you configure components essential for your application





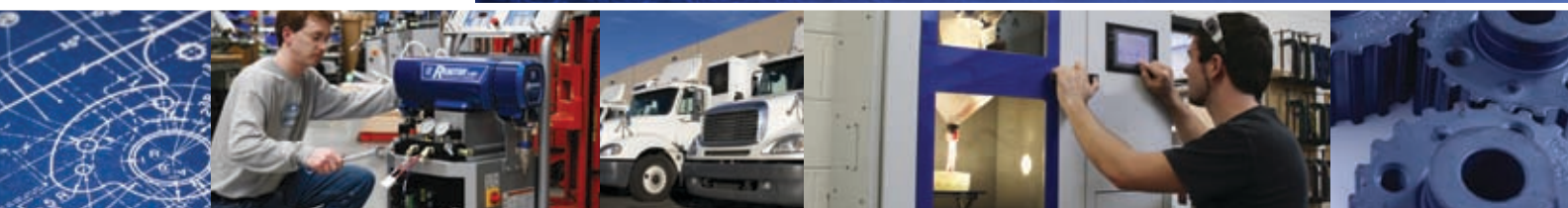
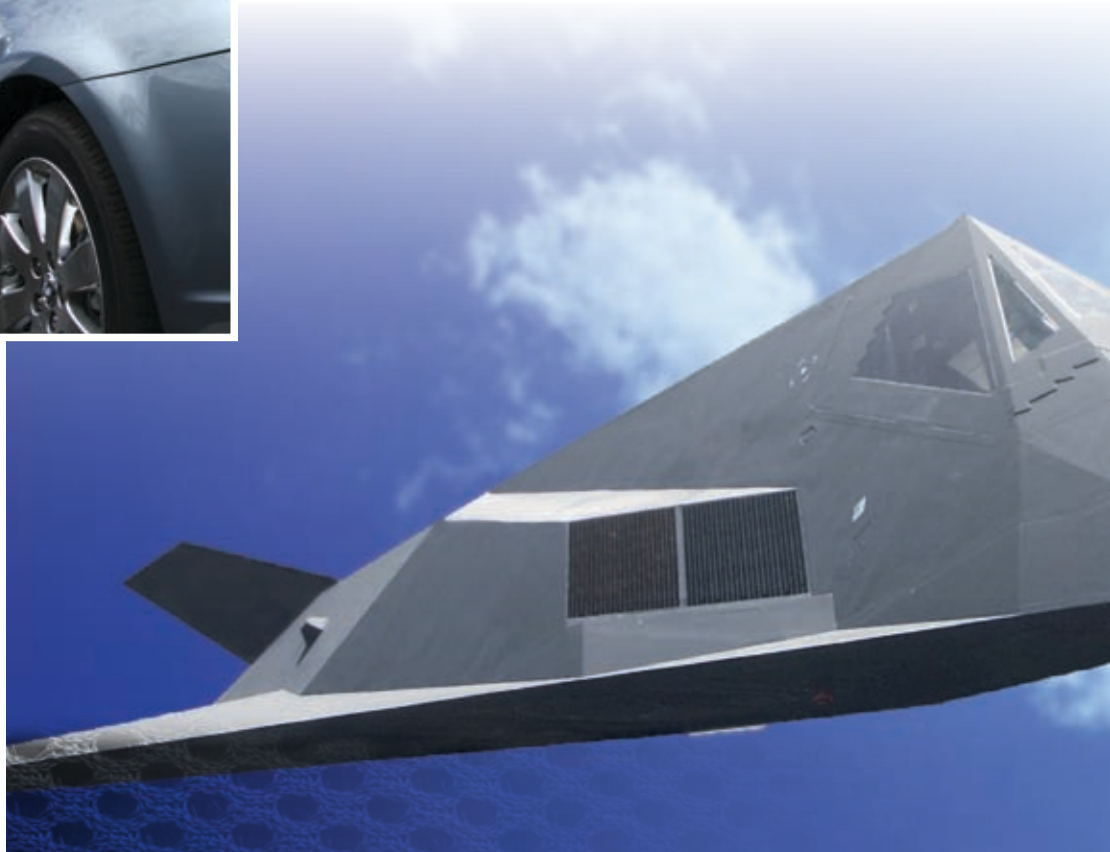
# A Global Network of Support

## Engineering expertise

Graco's engineering teams support your operation with everything from simple equipment modifications to complete custom configurations. Graco works closely with you to analyze your operation, materials and unique challenges.

## Proven track record

Graco has close working relationships with many of the world's leading manufacturers and material suppliers serving the composites market. With Graco, you can expect responsive service and support, as well as the accuracy and reliability you demand from your manufacturing equipment.



## Global distribution for local support

With more than 30,000 distributors worldwide, you can count on quick turnaround times for replacement parts and service.

With Graco's authorized distributors, you have access to experts who understand the unique needs of your business.



## Global manufacturing

- Minneapolis, Minnesota USA
- Rogers, Minnesota USA
- Anoka, Minnesota USA
- Sioux Falls, South Dakota USA
- North Canton, Ohio USA
- Suzhou, China
- Maasmechelen, Belgium

## Global support

With infrastructure throughout the world, your company will benefit from Graco's knowledgeable, global network of professionals.

## Find out more

In addition to dispensing equipment for advanced composites applications, Graco also offers a full line of FRP equipment.

Visit [www.graco.com/composites](http://www.graco.com/composites) for details.





## ABOUT GRACO

### PROVEN QUALITY. LEADING TECHNOLOGY.

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. Graco provides equipment for 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.

## GRACO LOCATIONS

### MAILING ADDRESS

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

### AMERICAS

#### MINNESOTA

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

### EUROPE

#### BELGIUM

European Headquarters  
Graco N.V.  
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 94688500  
Fax: 61 3 94688599

#### CHINA

Graco Hong Kong Ltd.  
Shanghai Representative Office  
Room 118 1st Floor  
No.2 Xin Yuan Building  
No.509 Cao Bao Road  
Shanghai, 200233  
The People's Republic of China  
Tel: 86 21 649 50088  
Fax: 86 21 649 50077

#### INDIA

Graco Hong Kong Ltd.  
India Liaison Office  
Room 432, Augusta Point  
Regus Business Centre 53  
Golf Course Road  
Gurgaon, Haryana  
India 122001  
Tel: 91 124 435 4208  
Fax: 91 124 435 4001

#### 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.  
Shinhan Bank Building  
4th Floor #1599  
Gwanyang-Dong, Dongan-Ku,  
Anyang-si, Korea 431-060  
Tel: 82 31 476 9400  
Fax: 82 31 476 9801

## SALES/ DISTRIBUTION/ SERVICE

Call today for product information or to request a demonstration.

**877-84GRACO** (1-877-844-7226) or visit us at [www.graco.com](http://www.graco.com).

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

North America  
Customer Service  
800-328-0211  
Fax 877-340-6427