New dispense equipment technology provides real-time ratio assurance for the glass industry

WHITE PAPER

Abstract

Proper bonding and sealing applications within insulating glass and curtainwall production require plural component materials that are accurately mixed and dispensed on-ratio. While a variety of mixing technologies currently exist, many have serious drawbacks that can impact final product quality, material costs and production time.

Recent additions to the proportioner market, including the Graco® ExactaBlend™ AGP Advanced Glazing Proportioner, possess new technology that addresses many of these drawbacks. This new technology offers improved real-time ratio assurance, reduced material usage and enhanced tracking of key information.

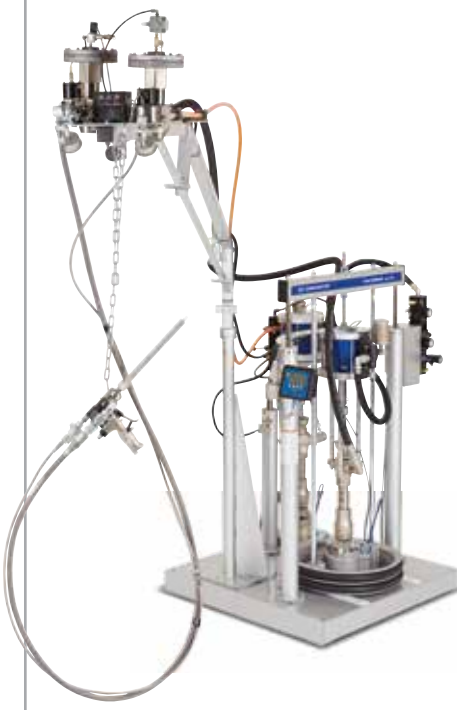
The glass industry faces unique adhesive challenges

The glass industry relies upon accurate mixing and dispensing of plural component materials. In the case of insulating glass and curtain wall, accurate mixing and on-ratio dispensing is critical to the quality of the final product.

Current glass adhesive and sealing proportioners, whether hydraulic or pneumatic, use mechanicially linked pumps, rocker arms and gear pumps. Continuous flow or shot metered material despensing can be obtained with optional features for fixed and variable ratio outputs.

Unfortunately, these existing proportioner systems have many drawbacks when used in insulating glass and curtainwall applications.

Accuracy: Adhesive and sealant manufacturers formulate their materials to be mixed at specific ratios for maximum performance. Deviations from manufacturer recommended mixing ratios can result in compromised product, resulting in lack of adhesion or non-cured material. Current proportioner technology relies on mechanically linked pumps or gear pumps to mix materials—without the benefit of real-time ratio monitoring. This is a problem when mechanical malfunction occurs.



New proportioner technology offers improved ratio accuracy, less material waste and the ability to track key data.

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Operational difficulty: Existing proportioner technology offers many challenges for operators. With current proportioning systems, operators must manually adjust ratio settings. The smallest error can lead to inaccurately mixed materials and compromised material curing and quality. Complex base purge processes, sensitive dispensing adjustments and difficult material changeover procedures present additional challenges.

Material waste and maintenance challenges: Existing proportioner technology can often be difficult to clean after a shift or during material changes. The cleaning process, often referred to as a base purge, can be complex, and may waste a significant amount of material.

Lengthy repair processes: Routine maintenance is required with regular use of any proportioner system, and it is important to limit the expense of maintenance in terms of part costs and man-hours.

Large capital investment: Upfront investment costs vary widely from system to system. The initial investment associated with many of these systems can range from $30,000 to more than $70,000, depending upon the type of system purchased and the options added to base units. Repair parts, maintenance and repair times may add significant expense to the operation of the system as well.

Lengthy wait times: Lengthy lead times on equipment orders can present challenges to users who must add or replace a system quickly. Advanced planning is necessary to ensure that the required systems are available on the end user's timeline.

Operator ease of use is engineered into new proportioner systems.

Advanced technology addresses drawbacks

Proportioner technology has changed significantly in recent years, with advancements designed to address the weaknesses and drawbacks of previous generations. New proportioner systems are feature rich and designed to provide more accurate mixing and streamlined user experiences.

Easy setup and simple ratio changes: With an intuitive user interface, an operator can set up the system and make ratio changes with a touch of a button. Operators can make ratio changes on the fly, allowing production to continue even when material requirements vary. In addition, new proportioners can be programmed so that ratio changes are only done by those with proper authorization.

Positive ratio assurance: When using two-part sealants or adhesives, maintaining the proper mix ratio is vital to the final quality of the product. With the Graco ExactaBlend AGP, if off-ratio conditions exist, the system automatically shuts down to prevent off-ratio material from being dispensed onto the curtainwall or insulating glass product, providing a higher-quality product.

Improved mixing technology: The Graco MD2 Valve and Tri-Core mixer technology offers high-pressure, high flow mixing and dispensing of plural component silicone materials. The applicators provide variable ratio weights between 6:1 and 14:1, and can perform at flow rates up to 4000 grams per minute.

Data tracking: Material usage, error reporting and other key data can be downloaded via USB, and or viewed easily on the system's data screen. This information is vital to keeping material costs low, tracking production and ensuring product quality.

Low material notifications: To avoid system downtime after adhesive materials are used up, new proportioners offer advance notification – prompting operators to replace the adhesive supply. The system offers up to ten minutes of advance notification, giving operators enough advance notice to change material supply and keep production moving smoothly.

Standard wear parts: The ExactaBlend AGP system relies upon proven Graco technology and standard global components including fluid regulators, flow meters, air motors and pumps. Standard wear components are less expensive than custom parts and can be shipped immediately, saving time for the plant.

System setup and ratio changes are accomplished with a touch of a button.

Benefits to glass manufacturers

The advancements in proportioner technology offer enhanced benefits to end users that may offer improved ROI, reduced material costs and superior operator experiences.

Accurate, on-ratio mixing

Plural component silicone materials commonly used in insulating glass and curtainwall applications are formulated to be mixed at specific ratios for proper curing and performance. Advancements in material tracking and improved fluid regulator pressure balancing have resulted in more accurate ratio mixing and dispensing. When material is correctly mixed and dispensed on-ratio as intended by the material manufacturers, then end results are not compromised, and glass manufacturers are more confident in the end quality of their products.

Material savings

Existing proportioners require base purges, a practice that removes the mixed material from the hoses and system. In many operations, base purges are conducted as often as twice a day, or at least once a shift. The material lost in these base purges can add up to more than 3,500 pounds (1600 kg) annually. Today's new proportioning systems significantly reduce the amount of material lost during base purges. The reduction in wasted material can offer savings of up to $6,000 a year.

Reduced scrap and deglazing

The quality of end products within the curtainwall and insulating glass industries is often related to the final mix and cure of the adhesive material involved in the production process. Proper mixing of plural component adhesives and sealants is key to obtaining a quality product; off-ratio mixing can result in inferior products that must be deglazed or scrapped. The accuracy and reliability of new proportioners limits scrapped products by providing positive ratio assurance and on-ratio mixing.

Ease of operation

Ratio assurance is a challenge on traditional proportioners, especially with delicate manual ratio adjustments on a system's rocker arms. Today's new digital systems change the way operators interact with the proportioner, and vastly improve control over the system. With a few touches of a button, the operator can change the system's mixing ratio, verify the proper calibration and review material consumption information.

The green light on the ExactaBlend AGP system indicates that materials are being applied properly and on-ratio.

Enhanced reliability
Proven pump technology, specialized hoses and other improvements have increased the reliability of today's proportioner systems to reduce downtime. In addition, standardized components offer shorter repair times and reduced expenses.

Global delivery and support
Graco's global distribution network allows the company to produce and ship the ExactaBlend AGP to any location. Rather than waiting weeks or months for delivery of a new system, end users may be able to purchase and install a new proportioner system in as little as two weeks. Local distributors can quickly ship standard wear parts and technical support is only a phone call away.

Summary

New proportioner technology for the glass industry addresses many drawbacks of existing systems. From ratio assurance and accurate mixing to material waste, systems like the Graco ExactaBlend AGP offer many benefits to end users in the insulating glass and curtainwall production industry.

BIOGRAPHY

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