

Donnelly Helps Graco Build a Better Spray Gun





Donnelly Engineers Help Design for Manufacturability

Supplier Inconsistency and Aging Design Prompt Changes



Donnelly's Graco Engineering Team

Graco demands strict tolerances from suppliers of parts for its PRO Xs electrostatic spray gun family. Since the spray guns carry fluids and electricity, any void represented was unacceptable for Graco, the global leader in fluid handling systems and components.

When the company's previous plastic molder began experiencing a high fallout ratio on a thick-walled section of the spray gun, Graco leadership was concerned.

"The gun barrels had always been a difficult part to mold," said Mark Ulrich, Graco Design Engineer. "Our supplier at the time was struggling to provide parts that met the print."

In addition to the molding issues, the PRO Xs family of 15 spray guns is replacing a mature product line. So Graco decided to find a new plastics supplier and completely redesign the product group. "We wanted to find a partner that would work with us to solve design issues," said Ulrich, one of several Graco engineers who worked on the project. "We had previous experience with Donnelly Custom Manufacturing and felt they had the capacity to handle a large project and would aggressively work with us to solve our molding challenges."

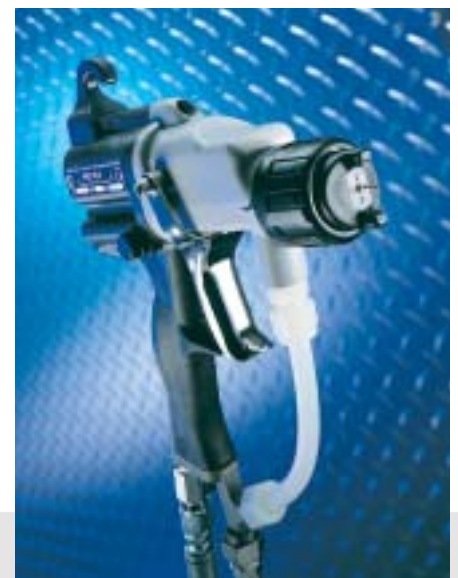
Donnelly Engineers Offer Short-run, Plastics Processing Expertise

Donnelly excels in the challenging world of short-run, close tolerance plastics processing. Many of its tools produce less than 1,000 pieces per year and are constantly changed. Donnelly's profitability requires well-designed tools to minimize production problems. So Donnelly took the unusual step of having project engineers work out of their customers' facilities. The engineers help customers avoid tooling problems by assisting in designing parts and tools for manufacturability and provide project management services.

The value-added engineering service was a factor in awarding Donnelly the PRO Xs manufacturing contract, according to Ulrich. "In addition to having a track record with us, we appreciated that a Donnelly engineer would be at our facility at least one day each week to assist in the redesign and keep the project moving."

Graco Benefits from Designing for Manufacturability

- Cavity void defects reduced
- Improved finish quality
- Sales growth across channels
- Increased product durability
- More efficient product operation





Donnelly Helps Eliminate Cavity Void Problem and Improve Quality and Durability

The Graco-Donnelly project team first turned its attention to eliminating voids in the thick-walled cavity of the spray gun. Donnelly recommended and implemented three actions:

1. In-mold sensing, utilizing transducers and a CRT screen, to make a visual inspection of each part during production.
2. Purchase of a North Star Imaging 80kV Microfocus X-ray machine to validate each part immediately after molding.
3. Conducting mold flow analysis to prevent production surprises.

The project team next set upon improving the product design. Leveraging Donnelly's deep experience in plastics manufacturing, Graco's designers were able to improve ergonomics, spray gun performance and durability. Before starting production, Donnelly recommended building a prototype tool. The prototype tool validated the new part designs and avoided expensive and time-consuming tooling changes.

Early Involvement by Donnelly a Key

The sleek, new PRO Xs electrostatic spray guns have revitalized the liquid finishing market for Graco. Existing Graco customers have upgraded and users of competitor products have converted to the Graco family. It has even led new users to try electrostatic spray guns for the first time.

According to Donnelly engineer Roger Kunkel, who assisted Graco during the design phase, early involvement on the part of Donnelly was the key. "By getting involved before the product design was started, we were able to ensure manufacturability was taken into consideration and prevent wall-cavity voids."

"Donnelly's engineering support was crucial in reducing time-to-market for the PRO Xs spray gun," said Ulrich. "The bottom line is design engineers continue to face increasing demands in these areas. A plastics partner capable of providing expert engineering assistance in addition to quality parts and great customer service is a valuable resource."

"I was pleased with Donnelly's performance during the redesign. The project included over 20 molded parts and several design changes. Donnelly was able to quickly make tooling changes and resample parts, which lowered costs and kept the project on schedule."

—Mark Ulrich
Graco Design Engineer



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