

Making the Case:

Custom Molding Case Studies from The Rodon Group



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Case Study #1:

Residential Window Hardware

As a leading authority on plastic injection molding, at The Rodon Group we are accomplished problem-solvers. A major manufacturer of doors and windows approached us about supplying some residential window hardware that they were currently producing in-house. Nearing its end of life, their tooling was producing parts of diminished quality, and they were seeking a value-based solution for future production.

We took the time up front to analyze the prints and samples in terms of each part's functionality and manufacturability. Using injection molding-specific design software, we re-engineered the parts to improve performance and reliability while also focusing on optimizing the molding process. We took into consideration aspects such as cycle times, material usage, and other process requirements to ensure products conformed to ISO and AAMA standards.

Our re-design involved building new, multi-cavity molds to yield a high rate of conforming product at a lower overall cost. Production involved the use of four different materials – nylon, vinyl, polypropylene, and polycarbonate – specified based on the individual performance requirements of each part. Using shot sizes as small as 0.03 grams and as much as 20 grams, injection molding took place on one of several energy-efficient presses in the 46 to 233-ton range. Finished parts measured in size from 3/8-inches in diameter to 4-inches square and featured both glossy and textured finishes.

Quality control involved first piece inspection as well as in-process and final inspections to ensure we upheld ± 0.005 " tolerances and satisfied all other quality criteria. The ability of our experienced professionals to work with this customer provided them with a better hardware at reduced cost and added overall value to their residential window product line. Our experienced professionals work with customers to create or refine their production process for maximized productivity, performance, and value.

For more information about this plastic injection molded window hardware project, or the other high volume plastic injection molding capabilities available, please see the table below or [contact us](#) directly.

Highlights of this Project:

Product Description: Plastic injection molded hardware for residential windows

Capabilities Applied/Processes: Tooling Design, Mold Making, Plastic Injection Molding

Equipment Used to Manufacture Part: 46 to 233 ton Nissei Presses

Overall Part Dimensions: 3/8" diameter to 4" square

Tightest Tolerances: ± 0.005 "

Material Used : Nylon, Vinyl, Polypropylene, Polycarbonate

Material Finish: Glossy/Textured

In process testing/inspection performed: First piece inspection and routine in-production inspections

Estimated Part Weight: 0.03 grams to 20 grams

Industry for Use: Residential Windows

Delivery Location: Nationwide

Standards Met: We modified samples, prints and models to optimize part function and processing parameters per ISO and AAMA standards

Product Name: Plastic Window Hardware

Case Study #2:

Point of
Purchase
Display
Components

Point-of-purchase display components require rugged construction in combination with an attractive appearance. At The Rodon Group, we injection molded a range of products, including items such as pegboard hooks, shelf dividers, and product stops for one of the leading companies in the point-of-purchase display industry. This project highlights our ability to provide value-added services in conjunction with close tolerance injection molding that equates to cost savings over the entire product lifecycle.

Working with the customer supplied prints, we first focused our attention on mold design. Our goal, as always, was to construct molds that would lead to volume high quality while minimizing production costs. By paying detailed attention to aspects such as cavity dimensions, gate location, venting, cooling systems, and more, we achieved optimal cycle times while upholding tolerances as close as ± 0.005 " across varying complexities in part geometry. One critical feature of these parts was a fine quality surface, so we leveraged the capability of our EDM equipment. This allowed us to create a very fine finish on the mold cavities to add clarity and quality to the surface of the finished part with no extra processing required.

Production involved the use of various commodity and engineering grade resins in shot sizes from less than one gram all the way up to 35 grams. With part sizes measuring from from 5/8" square up to 3.5" in length x 19" in width, we used a variety of injection molding presses in the 46 to 233-ton range. Machine vision inspection right at the press, combined with a robust set of test and measurement processes, ensured we satisfied all of the quality requirements.

The Rodon Group was able to demonstrate that done right, a high-quality mold and plastic injection experience can result in better quality at a better price. To learn more about this project, or the processes used to manufacture it, see the table below or [contact](#) The Rodon Group directly.

Highlights of this Project:

Product Description: Plastic injection molded point-of-purchase display components

Capabilities Applied/Processes: Tooling Design, Mold Making, High Volume Plastic Injection Molding

Equipment Used to Manufacture Part: 46 to 233 ton Nissei Presses

Overall Part Dimensions: 5/8" square to 3 ½" x 19"

Tightest Tolerances: ± 0.005"

Material Used: Various commodity and engineering grade resins

Material Finish : Fine EDM Finish (Electrical Discharge Machining)

In process testing/inspection performed: First piece inspection and routine in-production inspections

Estimated Part Weight: Less than 1 gram to 35 grams

Industry for Use: Retail point-of-purchase displays

Delivery Location: Pennsylvania

Standards Met : Using a pre-designed part, we designed for manufacturability by maximizing the molds to produce higher quality and quantity parts

Product Name : POP display products including pegboard hooks, shelf dividers and product stops

Case Study #3:

Polystyrene
Diagnostic
Kit for the
Medical
Industry

With our insight into the specialized requirements of the medical industry, a manufacturer of diagnostic equipment approached The Rodon Group to injection mold a lateral flow in-vitro diagnostic test cartridge. As a valuable product in their diagnostic portfolio, this company manufactured the kits in large quantities for use around the globe.

We built quality and cost effectiveness into the injection molding of this product in a number of ways. Material of construction was an FDA compliant, medium impact polystyrene. By accurately predicting the flow properties, shrinkage rate, and other material behaviors, we were able to optimize the mold design to achieve fast cycle times. We EDM finished the mold cavities to provide a fine quality surface on the finished part, and the smooth cavity interiors also facilitated easy releasing of parts from the mold.

By taking advantage of the operational features of our 177-ton hybrid press, which combines the high-load injection capability of a hydraulic press with the high repeatability and energy efficiency of an electric press, we saved production costs while producing a high rate of conforming product. In addition, our automation capabilities enabled us to further reduce production costs by minimizing expensive manual labor.

The cartridge featured overall dimensions of 5/16" x 7/8" x 3 3/4". Our precision-built mold, combined with microprocessor controlled processes, enabled us to consistently uphold ± 0.002 " tolerances over a very long production run. Since our hybrid press is equipped with machine vision capabilities, we provided 100% parts inspection.

As an ISO 9001:2008 certified provider of high volume injection molding services, our turnkey approach to plastic injection molding serves to improve the quality of plastic parts while reducing their overall cost profile. To learn more about this project, see the table below or [contact](#) The Rodon Group directly.

Highlights of this Project:

Product Description: Plastic injection molded diagnostic kit

Capabilities Applied/Processes: Tooling Design, Mold Making, High Volume Plastic Injection Molding

Equipment Used to Manufacture Part: 177 ton Nissei Hydraulic Presses

Overall Part Dimensions: 5/16" x 7/8" x 3 3/4"

Tightest Tolerances: ± 0.002 "

Material Used: Medium Impact Polystyrene

Material Finish: Fine EDM Finish (Electrical Discharge Machining)

In process testing/inspection performed: Vision Inspection System (for accurate measurement)

Estimated Part Weight: 8 grams

Industry for Use: Medical/Diagnostic

Delivery Location: Worldwide

Standards Met: ISO 9001:2008, FDA Compliant (raw material used)

Product Name: Lateral Flow In-Vitro Diagnostic Test Cartridge

Conclusion

The Rodon Group has been providing innovative, turnkey manufacturing solutions since 1956.

To learn more about how we can help with your next high volume, custom molding project, contact us at info.rodongroup.com/contact-us