

MoldMaking

TECHNOLOGY

**Domestic Collaboration
Yields Efficient Mold
Engineering - 16**

**Understanding the
Elusive Nature of
Mold Ventilation - 20**

**Strategic Mold
Cooling - 24**

**CAM Software
Maximizes Machine
Tool Potential - 34**

Domestic Tooling Collaboration Boosts Innovation, Efficiency, Savings



Pyramid Molding Group and Lettuce Grow partner to develop optimal tooling for a compact Hydroponic Farmstand.

Pyramid Molding Group and Lettuce Grow's collaboration on the Nook showcases technical expertise, innovation and effective project management. Source (All images) | KD Shah / Pyramid Molding Group

P pyramid Molding Group (PMG), a domestic mold builder and plastic injection molder based in Rockford, Illinois, partnered with Lettuce Grow to develop tooling for the second generation of its innovative hydroponic plant stand. This project involved collaboration on the technical considerations, cost-management strategies

Lettuce Grow created The Nook, a hydroponic plant stand. For budget-friendly and efficient production, they chose U.S.-based Pyramid Molding Group to handle both moldmaking and molding processes.

and project-management approaches necessary to successfully complete the project — from designing and manufacturing the tooling to molding and adjusting the tooling for the final parts.

Lettuce Grow, best known for its Hydroponic Farmstand, set out to develop a smaller version called “The Nook” suitable for homes and apartments. Originally, the company planned to get the tooling overseas but ultimately decided to keep the project within the United States. This choice was driven by the company realizing it could stay within its budget and take advantage of a seamless, all-in-one solution provided by PMG.

“We decided to keep the project in the United States to support local sourcing and strengthen community ties, aligning with our commitment to sustainability and local economies. By staying in the United States, we also avoided sending staff to China for tool validation and adjustments,” says Jacob Pechenik, CEO of Lettuce Grow.

Tooling Considerations

PMG collaborated with Lettuce Grow to identify the most cost-effective tooling options while ensuring the product’s design and functionality remained intact. Since the design was already largely determined, PMG focused on making tweaks to reduce tooling costs while maintaining functionality.

PMG’s in-house engineering team carefully evaluated mold gate types and design options to ensure optimal part quality and functionality. “We evaluated various gate locations for the different parts to balance flow, minimize defects and enhance the overall aesthetics of the final product. The choice of gate types was critical in achieving efficient filling and maintaining the structural integrity of the components,” Raymond Gibler II, PMG Operations Manager, says.

Lettuce Grow was also concerned with fit and function and wanted to ensure optimal water flow for plant growth in the Nook. To further refine the mold design, PMG used Moldex3D to conduct fill analysis on parts that incorporated a cold sprue. These analyses provided insights into the flow patterns and potential issues, enabling PMG to make informed adjustments to the design and ensure uniform filling and minimal warpage.

Design for Manufacturability

Throughout the design phase, PMG’s engineering team provided valuable input based on moldability considerations. “We implemented Design for Manufacturability (DFM) principles to streamline the production process. By creating detailed design concepts for all tools, we established a solid road map for our designers,” says Gibler.



LETTUCE GROW

CHALLENGE: Lack of quality control, long lead times, increased transportation costs and complicated supply chain.

SOLUTION: Partnering with a domestic integrated mold builder and molder.

RESULTS: Improved communication, increased quality control, shorter lead times, reduced transportation costs and a simplified supply chain.



PMG collaborated with Lettuce Grow to optimize tooling costs while preserving the product's design and functionality. The engineering team used Moldex 3D to analyze parts and make informed design changes.

Certain parts required a more in-depth DFM approach due to their complexity, ensuring that the designs were optimized for efficient and cost-

“Lettuce Grow chose to keep the project within the United States, recognizing the advantages of working with a local partner including quality control, shorter lead times, reduced transportation costs and a simplified supply chain.”

effective manufacturing. PMG worked in partnership with Lettuce Grow to create revisions to the design to gain functionality for the overall product.

Lettuce Grow also prioritized minimizing waste, so PMG used post-consumer materials. They also assisted with

product packaging development, as PMG would ultimately assemble and ship the finished Nook directly to consumers.

“Since we were ultimately packaging and shipping the product direct-to-consumer, we collaborated with Lettuce Grow to make sure we used as little packaging as possible for sustainability while still providing safety for the product,” says Gibler.

Project Management

To manage the project, PMG held frequent design reviews. Lettuce Grow was assigned a dedicated point of contact at PMG to oversee the tool build, with bi-weekly meetings scheduled to discuss updates on DFMs and part design.

During the early stages of the project, frequent design reviews were conducted to discuss part changes and moldability concerns. These collaborative sessions ensured both teams were aligned on design objectives and enabled PMG to address potential issues proactively.



A big advantage of working with a domestic manufacturing partner who offers both mold building and molding capabilities is improved quality control.