KAYSUN

INJECTION MOLDING & ENGINEERING SOLUTIONS

Custom Injection Molding Solves Issues, Improves Part Quality for INDUSTRIAL AND CONSUMER MANUFACTURERS

Homeowners would likely agree that the kitchen is the most used space in any home. Often it is also the most taken for granted — until something goes wrong with standard small appliances and fixtures, like a garbage disposal or faucet.

From part design and engineering through production, industrial and consumer manufacturers must be diligent about quality. Supplier partnerships must be carefully considered. Several injection molders in your supply chain may be able to produce parts. However, only those with proven custom injection molding capabilities can be relied upon for consistent quality that prevents defects, and effective solutions when problems arise.

CHALLENGE 1: KITCHEN FAUCET VALVE BODY

A leading plumbing fixture manufacturer designed a kitchen faucet containing a brass valve body. Brass is a standard plumbing material, and metal was an obvious choice to maintain the valve's sophisticated geometries.

Defect-free part production wasn't the issue. Instead, the manufacturer faced unanticipated regulatory issues. The brass kitchen faucet valve body was introducing lead and other heavy metals into the water supply.

Bringing the part into compliance required several components of the valve body to undergo metal-to-plastic conversion. However, the manufacturer experienced several setbacks.

The extremely tight tolerances of the part design and the 700°F melting point of the high-temperature resin selected for the conversion presented unique and ultimately insurmountable challenges for the manufacturer's chosen injection molder.

SOLUTION

The plumbing fixture manufacturer took corrective action, calling upon Kaysun to rectify the situation.

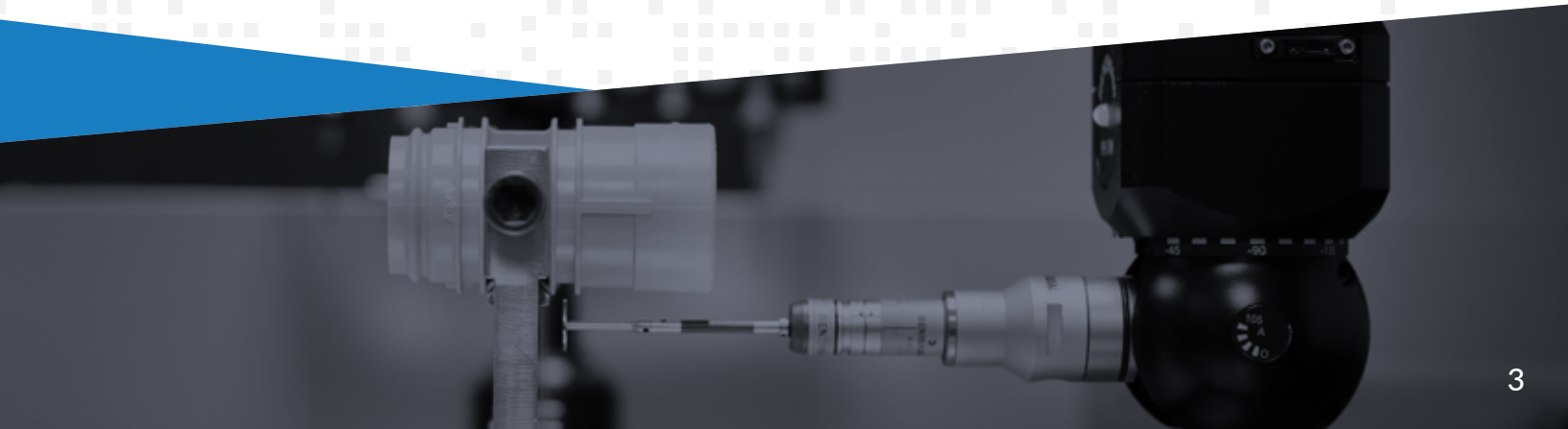
Kaysun's engineers collaborated with the manufacturer to understand the impediments and expectations of the complicated metal-to-plastic conversion project. Using this information and their considerable experience in Design for Manufacturability (DfM), the team:

- Designed the manufacturing process to meet the tight tolerances
- Utilized a four cavity mold, leading to consistent resin performance
- Accommodated the need to unthread steel to produce the valve body
- Developed precision tooling that included multiple moving parts and additional components to reduce breakdown risk
- Achieved production quality/repeatability using the high-temperature resin selected by the manufacturer

RESULTS

Kaysun's vast experience with metal-to-plastic conversion and in-depth materials knowledge was key in:

- Accurate, repeatable high-quantity production of the complex injection-molded plastic valve body
- Elimination of all concerns surrounding water supply contamination, bringing the manufacturer into regulatory compliance
- Reduction of total manufacturing costs



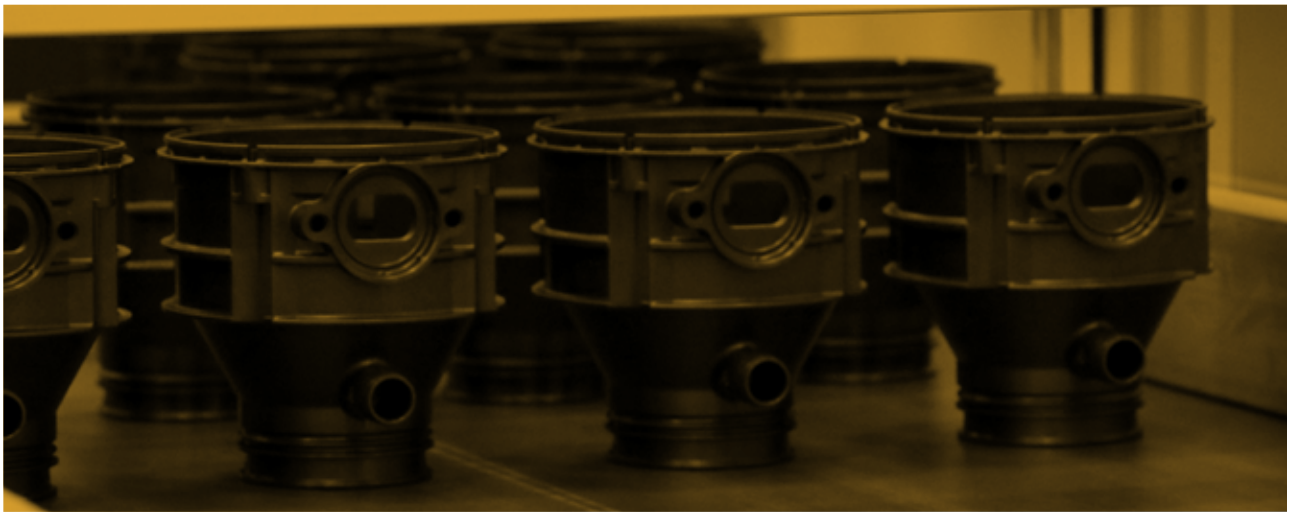
CHALLENGE 2: FOOD WASTE DISPOSAL HOUSING

A major manufacturer of food waste disposal units had a longstanding relationship with a commodity injection molder for specific part production.

The extreme operating environment of the disposals caused recurring issues with these parts.

Specifically, the machines' intense vibration during operation challenged the integrity of the rigid plastic disposal housing and its compatibility with internal seals and related plastic, metal, and rubber food waste disposal components.

Disposal leaking and loosening were common end-user complaints, jeopardizing the brand's long-standing reputation for quality.



SOLUTION

The manufacturer clearly understood that the commodity molder needed to be replaced. However, ending the relationship was not the complete answer to the multifaceted problem. The new custom injection molding partner had to bring versatile and demonstrated skill sets to the table.

With deep materials knowledge, specialized process training, and practical experience in key operations such as overmolding, insert molding, and metal-to-plastic conversion, Kaysun was chosen to take on the food waste disposal dilemma.

Kaysun's engineering and design teams didn't initially set out to fix the leaking and loosening issues. Instead, they used them as guides to a thorough dissection of the disposal and the underlying conditions contributing to the defects. Expert analysis revealed the need for:

- Metal-to-plastic conversion of disposal collars and seals that shimmied loose with disposal vibration
- Multi-material molding of existing plastic, metal, and rubber seals and components, and overmolding with TPE to prevent leaks and reinforce vibration thresholds
- Reconsideration of the rigid housing substrate to meet strength/vibration endurance standards, and to align with new internal overmolding TPEs
- Re-design of existing tooling to incorporate new gating scheme and in-depth dimensional analysis
- Automation cell that incorporated multiple components and materials

RESULTS

In-house custom injection molding design, engineering, and production capabilities augmented the expertise of Kaysun teams, resulting in solutions for the food waste disposal that:

- Offered better quality control, dimensional stability and a repeatable final product
- Provided better fitment between different components with significant contouring data and adjustments, reducing scrap
- Saved money on machine down-time and manual operators with custom automation

KAYSUN'S IMPACT

Kaysun is more than a preferred custom injection molder. We are fully committed to partnering with our customers to achieve quality outcomes, whether it's on a new project or correcting missteps of less advanced molders.

Our customer-centric approach taps into:

- Unparalleled custom injection molding design and engineering experience
- Decades of materials expertise
- Collaborative problem-solving
- Proactive customer service and communication
- Broad supplier networks

Contact Kaysun to learn more about how we can help you leverage custom injection molding for consistent, high-quality results.

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