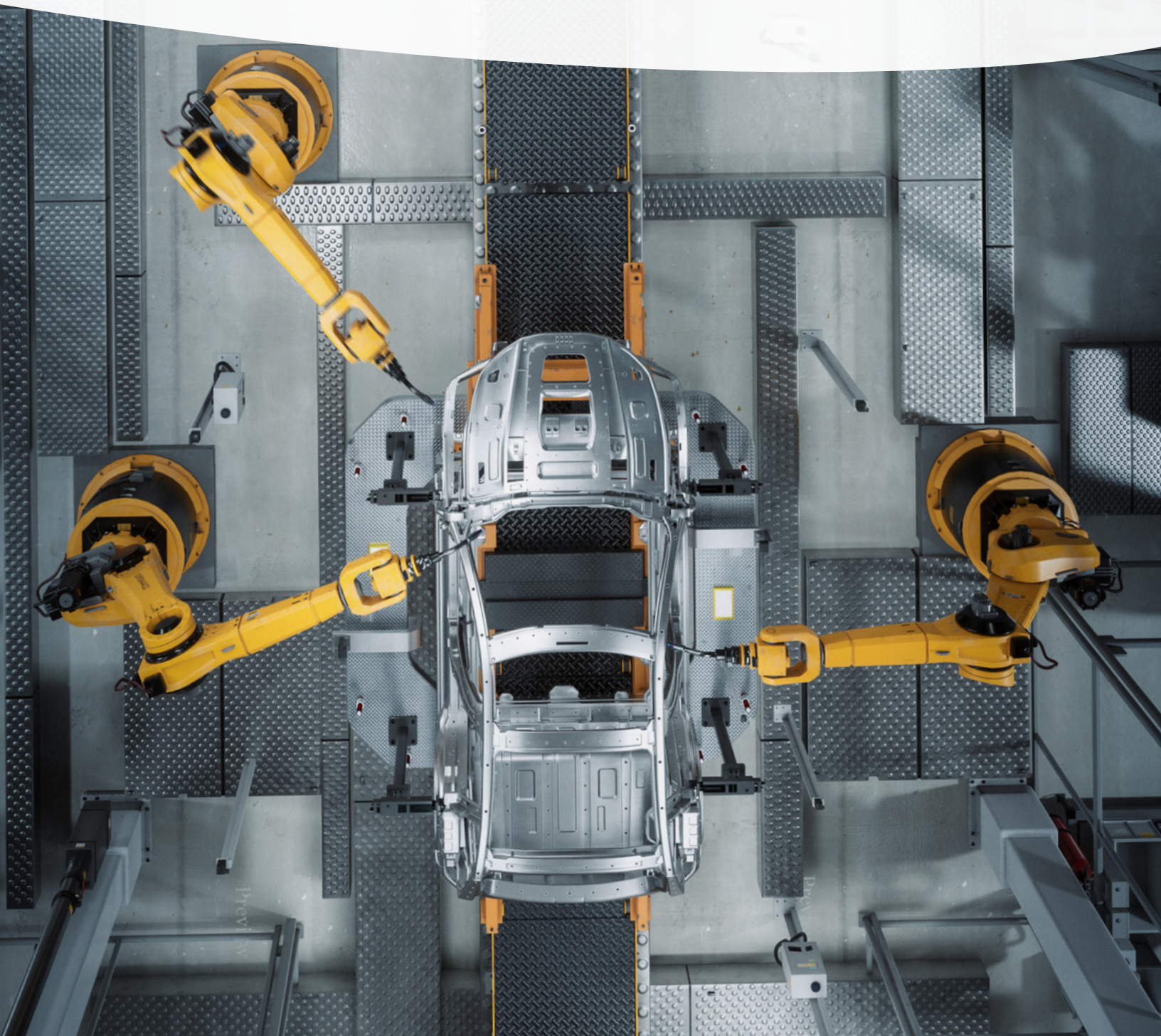
SEALING SPECIALTIES

Overcoming Chemical Incompatibility:

A Case Study in Custom-Designed Elastomer Gasket Development for Automotive Applications



Overview

Our long-standing relationship with a leading transportation supplier began many years ago when the company approached us to engineer and develop reliable elastomeric sealing solutions for various challenges. Since then, we have earned their trust by consistently delivering high-performing seal solutions designed to meet specific application requirements, such as temperature limits and fluid conditions. Today, we are the company's primary supplier of custom elastomeric seals. So when they encountered a challenge with a premature elastomer gasket failure, we called upon our top-tier engineers and material science experts to develop a more reliable solution.

Challenges

Our customer reported that their current elastomer gasket was failing prematurely due to a chemical incompatibility failure, compromising the mobile units' cooling system and prompting costly warranty claims. After an in-depth engineering review, we determined that the gasket material was compatible with the coolant, indicating that coolant compatibility wasn't causing the failure. Further testing revealed that the leak path was caused when oil contacted the gasket during routine oil changes, pointing to a chemical incompatibility with oil, not coolant. Our task was to find an elastomer gasket material that would withstand exposure to both coolant and oil while being chemically compatible with both.

Solutions

Having determined the failure mode during the engineering review phase, we hit the ground running by tapping into our network of industry-leading seal suppliers to select a more technically advanced elastomer material. We leveraged our decades-long relationship with our supplier, a global seal solutions leader, to develop a custom-designed elastomer gasket to satisfy the coolant and oil compatibility requirements and other application data, such as temperature and pressures.

We initiated the following seal capabilities to devise a high-performance elastomer gasket solution:

Material Selection

Knowing we needed to choose an elastomer gasket material with better chemical compatibility, we began with an in-depth material selection review. Thanks to our vast material science expertise, we worked to select the best chemically compatible material to meet all our customer's application requirements. We chose a superior material based on the fluids and application demands. Through rigorous material testing, we proved the concept and verified that our proposed material solution was correct.

Reverse Engineering

Reverse engineering – We reverse engineered because we didn't have a part-specific drawing. During this phase, we sent an engineered drawing to our customer for approval. After they verified the dimensions and approved the concept, we moved on to the next phase: tooling.

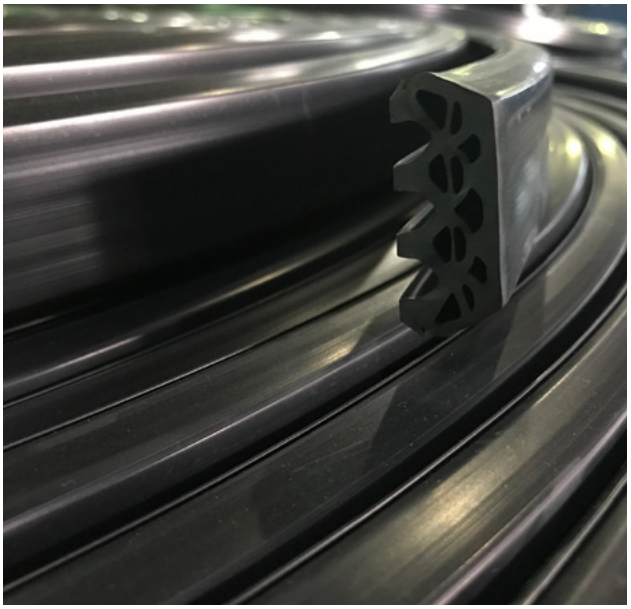
Tooling

As a custom-designed and specially-molded part, the new elastomer gasket required new tooling to mold the gasket to the specific size and geometry. As a result, our engineering team worked with the tooling department to begin designing the tool.

Finally, we were ready to produce first article samples, a handful of samples from the initial production run that our customer could use to verify the performance and quality. As a result, our engineering team worked with the tooling department to begin designing the tool.

Results

Our thorough engineering review and analysis to provide a more dependable part yielded impressive results for our customer. Implementing the new elastomer gaskets has significantly reduced warranty claims, demonstrating their enhanced reliability, performance, and cost-effectiveness. These gaskets have been in circulation for a year without any warranty claims, indicating their superior quality. We are thrilled to continue collaborating with our customers to tackle new seal challenges and provide them with innovative solutions.



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