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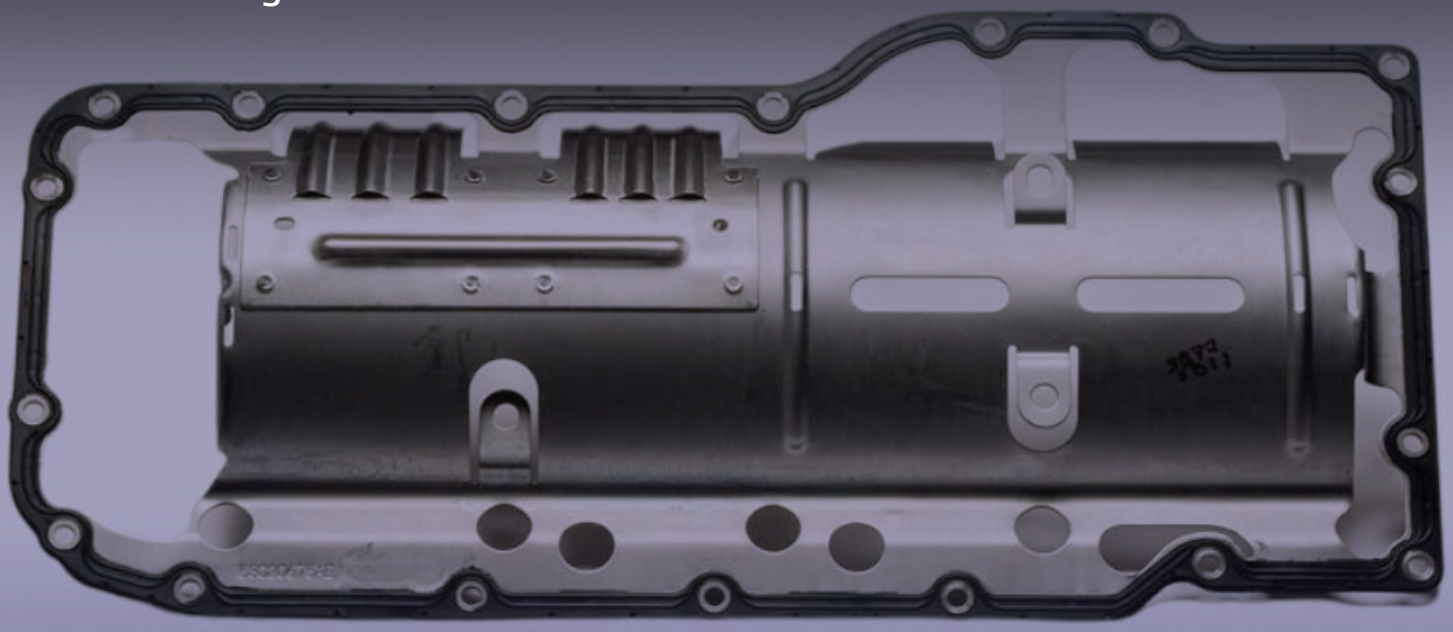
POLYMER SEALS

SOLIDWORKS

MORGAN POLYMER SEALS AUTOMOTIVE GASKET LEADER ACCELERATES SEAL DEVELOPMENT TO MEET ELECTRIC VEHICLE BOOM WITH 3DEXPERIENCE WORKS SIMULATION

Case Study



With the increased volume of simulation studies required in response to the emerging electric vehicle (EV) boom, Morgan Polymer Seals chose to bring simulation work on its gasket products in-house by acquiring **3D**EXPERIENCE SIMULIA Structural Mechanics Engineer (SME) capabilities and running the greater number of simulations required in the cloud.

goengineer
www.goengineer.com

3DEXPERIENCE SALES
info@goengineer.com
888.688.3234

TECHNICAL SUPPORT
support@goengineer.com
888.559.6167

Challenge:

Meet automotive original equipment manufacturer (OEM) and tier 1 supplier requirements to run simulations on every seal more efficiently and cost-effectively, while advancing materials R&D and new product development related to the electric vehicle (EV) boom and new markets.

Solution:

Add **3D**EXPERIENCE Works solutions to the existing SOLIDWORKS implementation. Use Structural Mechanics Engineer for simulation along with Collaborative Industry Innovator and Collaborative Business Innovator for PLM (product lifecycle management) cloud-based **3D**EXPERIENCE/SIMULIA Structural Mechanics Engineer (SME) and **3D**EXPERIENCE/ENOVIA Industry Innovator to existing SOLIDWORKS implementation.

Results:

- Acquired new business from new customers
- Cut simulation turnaround time from two weeks to one day
- Advanced materials R&D
- Realized capacity for increased simulation volume due to EV boom

Morgan Polymer Seals (MPS) is a privately owned automotive supplier that designs and manufactures custom gaskets and seals for power train, fuel, and electrical applications. Founded by CEO Kevin Morgan in 1997, the company today delivers 100 million parts each year to automotive original equipment manufacturer (OEM) and tier 1 supplier customers in North America, Europe, and China. MPS has established a reputation as the most trusted name in automotive gaskets by consistently selecting the best materials to fit each specific seal application environment and fluid exposure.

The company's growth and success stem largely from its commitment to leveraging engineering, manufacturing, and automation technologies to improve productivity and product performance. MPS has continually invested in rubber and silicone injection-molding and compression-forming machines, and has utilized the SOLIDWORKS® 3D design system for many years to develop seal concepts, designs, and tooling; and exchange design data with customers and partners. Until recently, the seal manufacturer outsourced finite element analysis (FEA) studies, which are often a requirement for doing business with automotive OEM and tier 1 supplier customers.

However, increasing development demand related to the emergence and growth of the electric vehicle (EV) and hybrid vehicle markets prompted the seal manufacturer to bring FEA studies in-house to improve efficiency and reduce costs, according to Design Engineer Thomas Morgan. "The EV surge creates new opportunities and challenges for us," Morgan explains. "With a combustion engine, seals primarily maintain pressurized systems, stop leaks, and prevent intrusion from the outside environment, such as an oil pan gasket or a dust seal on an intake manifold. On an EV, every wiring connection requires a seal to provide strain relief—holding the wire in place—as well as to keep water and moisture out to prevent electrical short circuits.

"With the increased volume of simulation work required by the automotive transition to EVs, we decided to acquire our own simulation capabilities to keep up with the growing demand and work more efficiently and cost-effectively," Morgan adds. "After conducting research into FEA solutions, we chose the cloud-based **3D**EXPERIENCE® Works portfolio. We use Structural Mechanics Engineer from SIMULIA® for simulation along with Collaborative Industry Innovator from ENOVIA® and Collaborative Business Innovator for PLM (product lifecycle management).

"We chose a 3DEXPERIENCE Works Simulation solution because it's cloud-based, which supports our remotely located engineering organization, works seamlessly with SOLIDWORKS design data, and incorporates the Abaqus Explicit solver, which is best suited for the types of simulation studies that we need to conduct on our parts, which can involve hyperelasticity, creep, fatigue, and contact."

— Thomas Morgan, Design Engineer

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MAKING SIMULATION MORE EFFICIENT, COST-EFFECTIVE

Since adopting Structural Mechanics Engineer, MPS has realized faster simulation turnaround times and reduced simulation costs, despite conducting a substantially larger volume of FEA studies. Simulation studies that used to take two weeks to complete are now done in a day, which not only benefits everyday production work, but is also driving research into new materials calibration and analysis.

"We are using Structural Mechanics Engineer in two ways," Thomas Morgan explains. "We are using it to verify that a seal will work in a specific application as a quick turnaround service to our customers, and we are also using it to iterate on new product development because it's easy to hammer out and speed up iterations on new design concepts without overburdening computing resources because we can run simulations in the cloud."

SHARING ENGINEERING RESOURCES AND EXPERIENCE WITH CUSTOMERS

MPS has realized the additional benefit of working more closely with its customers since adopting Structural Mechanics Engineer by sharing its engineering resources and experience in helping customers develop and improve designs requiring seals. "When it comes to rubber and silicone, we have the manufacturing know-how about the best way to make a seal and understand important aspects of molding, such as the curing process," Morgan stresses.

"When you combine our experience with the information provided by Structural Mechanics Engineer simulations, we can help our customers even more by engaging with them during initial design," Morgan continues. "For example, a customer can come up with a design, and we can run a simulation on it to evaluate insertion forces as an additional service. With Structural Mechanics Engineer, we can produce the high-quality seals for which we're known while also helping our customers improve their designs."

EMBRACING CLOUD COMPUTING TO SUPPORT GROWTH

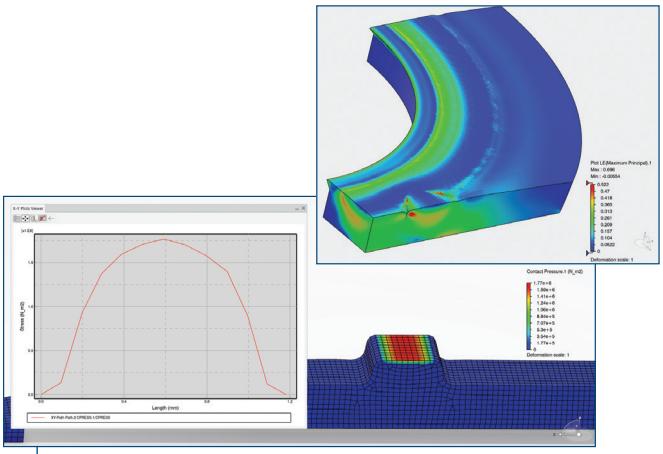
Even though MPS could have acquired comparable simulation desktop capabilities, it would have had to incur additional costs to do so by acquiring expensive hardware to increase computing power. The company's decision to utilize Structural Mechanics Engineer aligns with the seal manufacturer's strategy of embracing cloud computing to more cost-effectively maintain growth.

"We acquired Structural Mechanics Engineer because we needed advanced FEA capabilities, but also because we see cloud computing as an important growth strategy," Morgan explains. "Our production is in Mexico, but all of our engineering resources are scattered across the United States. We're just starting to leverage the **3D**EXPERIENCE Works PLM capabilities and plan to eventually consolidate all our design and engineering tools onto the cloud-based **3D**EXPERIENCE platform."

Focus on Morgan Polymer Seals
VAR: GoEngineer, San Diego, CA, USA

Headquarters: 2475-A Paseo de las Americas #3303
San Diego, CA 91254
Phone: +1 619 498 9221

For more information
www.morganpolymerseals.com



Using **3D**EXPERIENCE SIMULIA SME solutions, Morgan Polymer Seals has realized faster simulation turnaround times and reduced simulation costs, despite conducting a substantially larger volume of complex simulation studies, such as contact and hyperelasticity.

Our **3D**EXPERIENCE® platform powers our brand applications, serving 11 industries, and provides a rich portfolio of industry solution experiences.

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