

Challenge Accepted.



NEW MATERIAL FOR PRECISELY ENGINEERED VEHICLE



» CASE STUDY: MAXXAM™ POLYOLEFIN FORMULATIONS





LIGHTER WEIGHT, GREATER DURABILITY FOR LUXURY VEHICLES

THE CHALLENGE

DENSO, a leading supplier of advanced automotive technologies, systems and components for the world's major automakers, approached Avient looking for material science expertise and development. The goal? Create a new olefinic material for an HVAC door flap that would remove weight and withstand copper deposits in a luxury vehicle for an exclusive German automaker.

HVAC doors are typically produced by injection molding two parts that provide structural strength and air sealing performance. However, in this case, designers had reduced the thickness of the part wall significantly to achieve a relative weight saving of 90 percent. This meant the raw materials and processing method needed to be reconsidered.

In addition to the lighter weight requirement, the material and process would need to deliver an ultra-low cycle time with improved processability and tailored crystallization dynamics, while also resisting warpage after molding, a common issue for thin walled plastic parts.

An added challenge was to ensure the material was stabilized against potential degradation. As a core part of the HVAC system, the door flap is situated close to a set of brush motors, which are packed with copper wires. Over time, minute copper particles can deposit onto the part, promoting a catalytic degradation process.

Finally, with headquarters, manufacturing sites, and engineers spanning the globe, it was important that the collaborator DENSO selected could operate internationally as well as on a local scale.

THE SOLUTION

With its global footprint, Avient was able to work with DENSO both in initial trials in Japan as well as locally at a manufacturing facility in Europe. This global reach also allowed Avient to respond quickly to mold trials, and eliminate import and shipping challenges.

The technical services team at Avient worked closely with the European material engineering team at DENSO under the lead of Mr. Christoph Wallner (Unit Head, DENSO Europe), throughout the challenging development and fine tuning of the formulation.

Avient engineered a new customized formulation for the part, which provided both the processability required for extremely short cycle injection-compression molding, as well as including an additive to stabilize the material when in contact with copper. This additive protects the door from cracking as it comes into contact with copper particles over time.

In addition, the new material also provides anti-static properties and low VOC levels, which helps the system adhere to regulations such as the Vehicle Interior Air Quality (VIAQ) standard.

THE IMPACT

Through a combination of its global footprint, expert technical services, and local production, Avient accepted DENSO's challenge and responded with a new customized formulation that exceeded performance requirements, eliminated overmolding, and reduced cycle times.

To learn more, please contact Avient at +1.844.4AVIENT (1.844.428.4368) or visit www.avient.com.