

Valeo Climate Control

Sector:	Automotive
Technology:	SLA® system

Automobiles of the '90's - a Very "Hot" Commodity

A wave of buying enthusiasm has hit the consumer market. Riding the crest of the excitement - automobiles. They're hot. New improved body styles, added safety features and enhanced option packages make the automobile much more than it used to be. To keep up with the heightened demand for improvement, manufacturers must update their models more quickly than ever before. Finding new ways to shorten time-to-market is crucial.

The pressure for faster turnaround weighs heavily on the shoulders of every vendor who must meet the strict requirements laid down by the auto manufacturers. Where the additional burden may be cause for concern with some, one vendor in the auto making loop has found a way to enhance product quality, shorten lead times, and better serve customers by adding a key member to its team - stereolithography (SL).

A New Advantage

A multi-national first tier vendor for a majority of auto manufacturers worldwide, Valeo Climate Control designs and manufactures vehicle heating and A/C systems. Whether you're switching on the A/C as you travel down a hot and muggy Taipei roadway or warming up to the heater on a cold and windy Chicago morning, you are face to face with products like those built by Valeo. Located behind the instrument panel, these assemblies can contain as many as 100 individual components and though not always seen, their performance contributes significantly to the comfort of today's driver.

Automobile manufacturers continue to turn up the heat on suppliers like Valeo, increasingly relying upon their ability to help cut costs and lead times. With an ever-growing number of components and subsystems being outsourced, Valeo can't afford to let manufacturers see them sweat. The testing and verification processes for these complex assemblies are intense. Multiple design iterations and tooling modifications can make for costly, time-consuming results. Yet Valeo remains cool under pressure. Aware of the fact that SL could produce prototypes for verification and testing raised the big question --would bringing an SLA system in-house help optimize their delivery cycle?

Valeo knew the potential savings in tool reworking costs alone could prove enormous. With an estimated cost savings of 30-50% over conventional methods and a realizable timesavings of up to 50%, purchasing an SLA system became the clear choice.



Rapid Prototyping

What is a Prototype Worth?

With this new team member up and running, visual verification at Valeo took on a whole new meaning. Using SL prototypes, designers could have physical confirmation of what the CAD data could only display in two-dimensional space. "People often talk with their hands," says Karl Den Valeo's Rapid Prototyping Specialist. "Having a physical part available is crucial when checking visual defects or inaccuracies." Without a prototype in hand, small mistakes may slip by unnoticed. SL enables Valeo designers to discover inaccuracies early on, long before tooling is fabricated and change becomes cost-prohibitive.

Karl Denton knows the value of an SL part. Before joining Valeo, he was one of the specialists who helped bring SL into a major US auto manufacturer. "Some people have trouble seeing three-dimensional CAD on a two-dimensional screen. I'm one of them," explains Denton. "Even solid CAD models are still just a two-dimensional representation on a flat screen." Using SL, Valeo isn't limited only to design verification. From prototypes to production tooling and straight through to testing, SL is an integral part of each major phase of the design and manufacturing process. With the CAD design now verified, Valeo calls in the next team players tooling professionals.

The SL Master and Tooling

Holding the physical SL prototype, the tooling experts analyze and criticize the design. "We ask them what they think. They tell us if it can be done and how we can make it better," explains Denton "In one instance, 110 issues were identified and corrected before tooling." This definitely takes some of the heat off. When mistakes like this are caught early on, Valeo avoids the costly scrapping or reworking of tooling. From the knowledgeable hands of the tooling professionals to the rigorous environment of the test shell, the SL prototype continues to provide critical engineering data. Mounted inside a vehicle frame known as a shell, the prototype endures a variety of test situations designed to determine part durability. Testing everything from hot and cold extremes to low-level vibration, engineers observe how the parts will fare under actual driving conditions.

In the Home Stretch

With the initial testing completed and valuable input from the tooling professionals integrated into the design, the Valeo engineers enter the final phase. It's here that the SL pattern moves from working prototype to a manufacturing essential. Used to build a spray metal or solid epoxy mold, the SL pattern allows engineers to rapidly produce a short run of injection molded parts in the final production material. These limited quantities are tested for vibration evaluation on a shaker table and for overall performance in the most rigorous of environments - the vehicles themselves. At the end of this phase, the Valeo team has a finished part. More importantly they know that their assembly is not only going to work, but that it will fit together precisely, and won't fail under stress or extreme conditions.

A Lap Ahead

The era when auto manufacturers require their suppliers to utilize rapid prototyping technologies like SL has already begun. But at Valeo that's one requirement that doesn't even make them blink. The atmosphere remains charged with the electricity of creative ideas and innovative solutions. Projects and prototypes move through the design and manufacturing cycle with lightning speed. Designers and engineers remain calm, cool and collected, knowing that with SL at their fingertips, they're ahead of the competition.



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