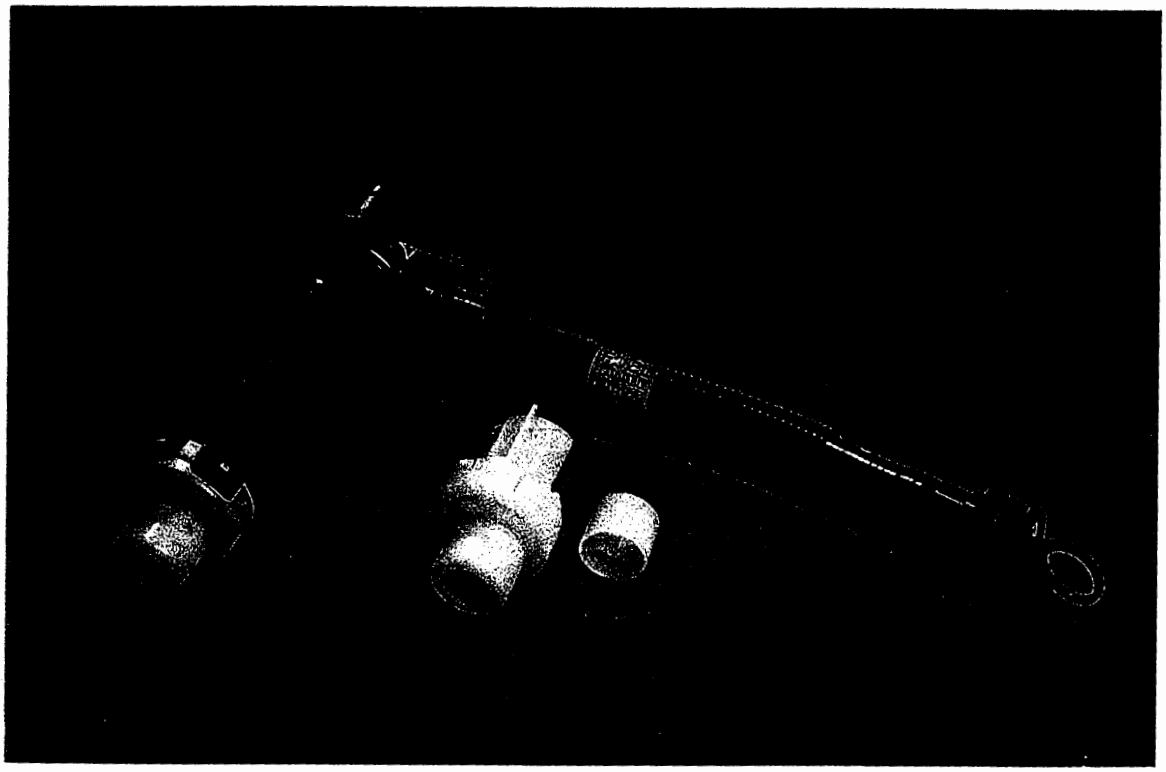
Shell Chemicals

Part of Ealon

2.5M lbs in 2002

CARILON POLYMERS CASE HISTORY

GT Products



CARILON™ Polymers and a patented design for onboard refueling vapor recovery (ORVR) valves by GT Products are helping auto makers meet the EPA's mandate to reduce hydrocarbon emissions at the fuel pump. CARILON Polymers' combination of chemical resistance to fuels, strength and toughness are vital for this challenging application. For more information about CARILON Polymers, call 1-888-CARILON (888-227-4566).

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www.shellchemical.com

Shell Chemicals

PRESS INFORMATION

CARILON Polymers' Strength and Toughness Help Automotive Industry Leap Regulatory Hurdle

GT Products Case History

A mandate from the U.S. Environmental Protection Agency (EPA) to reduce hydrocarbon emissions at the pump presented a tough challenge for the automotive industry. Shell Chemicals[1] CARILON[2] Polymers and a patented design for onboard refueling vapor recovery (ORVR) valves by GT Products (Ann Arbor, Mich.) are helping auto makers leap this hurdle.

The EPA has ruled that beginning with 1998 models, 40% of the cars manufactured for U.S. highways must be equipped with ORVRs. By the year 2000, every new automobile must roll off the assembly line sporting an ORVR. By 2003, all new light trucks and sport utility vehicles must have these emission-reducing devices installed.

ORVRs, mounted on the automobile fuel tank, significantly reduce hydrocarbon emissions during refueling. Fuel travels from the pump nozzle through the car's filler neck to the fuel tank. Hydrocarbon vapor escaping from the tank is led through the ORVR valve and into a charcoal canister. The hydrocarbons are then burned off by the vehicle's engine. Currently, without ORVRs, five to six grams of hydrocarbons per gallon of gasoline are released to the atmosphere during refueling. With ORVR technology, that amount drops to less than the EPA's mandated level of 0.2 grams per gallon. The GT Products part, molded with CARILON Polymers, lowers the amount to approximately 0.06 to 0.08 grams per gallon. The device also acts as an automatic shut-off for the fueling nozzle once the fuel tank is 95% full.

Strength and durability are vital properties for this injection-molded application. "The ORVR component is an integral part of the automobile fuel system," says Ken Zander, GT Products sales manager. "The part needs to be made from a material that resists degradation in a harsh fuel environment."

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1 The expression 'Shell Chemicals' refers to the companies of the Royal Dutch/Shell Group which are engaged in the chemicals business. Each of the companies which make up the Royal Dutch/Shell Group of companies is an independent entity and has its own separate identity.
2 CARILON is a Shell trademark.

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"In 1995, we originally specified polyester for our ORVR design," recalls Bob Benjay, GT Products chief engineer. "But polyester, although commonly used in fuel systems, is being phased out as new, more robust fuel-resistant materials become available. Then we tried acetal and a host of other materials."

"We received excellent assistance from Shell Chemicals during our molding trials," says Paul Wrona, GT Products project engineer. "They provided us with CARILON Polymers' performance data as well as quick delivery of the sample material."

To ensure that the material was appropriate for the job, GT Products put CARILON Polymers through vigorous drop, shock, durability, and fuel soak testing.

"Of all the materials we tested for this application, CARILON Polymers gave us all the properties we needed, notably strength and fuel resistance, at the right value," adds Wrona. GT Products is very optimistic about CARILON Polymers' potential in this application, and Wrona estimates a volume of 3 million units per year.

CARILON Polymers are engineering thermoplastics with a unique combination of physical properties compared to traditional materials such as polyamides and polyacetals. These properties include strength, stiffness, performance over a broad temperature range, toughness, superior wear and friction characteristics, low hydrocarbon permeability and resistance to a variety of aggressive chemicals.

CARILON Polymers are available in extrusion grades and a variety of injection molding grades, including glass reinforced, flame retardant, mineral filled and lubricated compounds. The polymers can be easily processed on conventional molding and extrusion equipment, and their fast -up can lead to significantly reduced cycle times in injection molding applications.

For more information on CARILON Polymers, visit the Shell Chemicals Web site at *www.shellchemicals.com*. In the United States, customers can write to Shell Chemical Company, P.O. Box 2463, Houston, Texas 77252-2463 or call toll free at 1-888-CARILON (1-888-227-4566). In Europe, customers can write to Shell Chemicals Ltd., Shell Centre, SEI 7NA or call +44 171 934 3300.

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