Gems™
Sensors & Controls

Solving Difficult Customer Problems

Sensors can help to answer key questions about products, systems and processes. The accurate empirical data they offer can be used to address concerns such as, “How hot is my boiler running?” “Do I have enough airflow within my oxygen delivery systems?” “Is sufficient oil reaching my engine?” “Do my hydraulic lines have sufficient pressure ?” As with any question, the first and most important step is to correctly frame it. And that’s exactly where Gems Sensors & Controls begins with its customers.

Adopting a global approach

Gems designs and manufactures a broad range of liquid level, flow and pressure switches, solenoid valves, and fluid systems for OEM requirements. For the direct benefit of its customers, the company maintains three complete manufacturing facilities in North America, Europe, and Asia, along with local sales, engineering and service offices. All R&D, design and applications engineering resources are centered around the manufacture of consistently high-quality products, rapid customer response and on-time delivery. Each facility has the necessary equipment, tooling and infrastructure for world-class manufacturing support, regardless of location. All products are manufactured and tested to the same stringent quality standards. For global OEM customers, this localized component and subassembly manufacturing significantly reduces lead times and costs.

Understanding the application

Customer experiences in sensing technology can range from long-time users who thoroughly understand their application, to new customers in need of extra help. For all customers, the common starting point is the Gems sales team. The team listens closely to the particulars of each measurement challenge, gathering data on target parameters, performance goals, volumes, and price points. Collected data are analyzed to help recommend a “best-fit” solution. The team can also evaluate legacy solutions for available technology upgrades or new application requirements. Particular emphasis is on finding products that improve lead times and performance at a lower price point. Collected feedback is also used by Gems to help continuously improve its own internal processes.

Optimizing product performance specifications

After an initial sales team assessment, Gems works with a customer's own engineering team to refine target product specifications. For OEM volume sensors, the goal is to place working prototype samples into a customer's hands as quickly as possible. These samples allow customers to accurately assess real-time sensor performance within the actual application environment, as well as to validate their own designs. Gems may also opt to conduct their own in-house simulations of product performance prior to manufacturing.

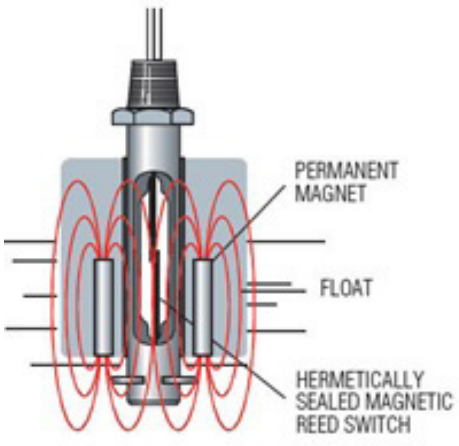
Applying value analysis/value engineering (VA/VE)

When it comes to solving difficult customer problems, there's no substitute for hands-on experience. Gems actively applies its own wealth of engineering, lean manufacturing and strategic sourcing expertise with value analysis/value engineering (VA/VE). Customers can trust the VA/VE process to help streamline their specified product designs, including significant reductions in customer time to market, lead times and costs. As part of VA/VE, each product is tested for manufacturability prior to full-scale production. This is to ensure that OEM volumes can be produced immediately upon receipt of final customer approval and a purchase order. Once approved, products are manufactured to agreed specifications, with consistently high-quality runs, in the shortest possible timeframe.

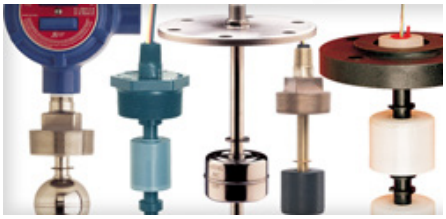
Evolving products for evolving applications

In one example, an off-highway vehicle (OHV) manufacturer asked for help in analyzing a puzzling set of recent field failures. Customer history with the product in question dated back to the 1990s, when Gems originally developed a liquid level sensor to support their construction equipment hydraulic fluid reservoir tanks. Because these vehicles are especially large, associated repairs tend to be complex and expensive.

The primary customer application goal was to maintain optimal fluid levels. They also needed a way to receive early warning of possible tank leaks and hydraulic fluid level drops. To meet these goals, Gems designed and manufactured a custom liquid level switch, now offered as a standard product. The LS-7 is a low-cost, side-mount single-point level switch, with choice of either die-cast zinc, stainless steel, or engineered plastic body. Its rugged design is compatible with a variety of oils, fuel, water and chemicals. Within the stem of the device is a hermetically sealed, encapsulated reed switch. A magnet within the hinged float (stainless steel, nylon or polypropylene) will cause the switch to activate as the float changes state, responding when fluid levels fall or rise (dropping, if the switch is normally closed; rising, if normally open). The float can also operate with various media over a range of defined minimum specific gravity. For the standard LS-7, that range is 0.55 to 0.80.



The original LS-7 offered cost-effective hydraulic fluid level sensing with high reliability. Because of this, the customer recently incorporated the LS-7 into several brand new equipment designs. Field failure data collected since their installation showed unprecedented corrosion of the LS-7 die-cast zinc sensor housing. There were also unexplained wiring harness failures. When the switches would fail, the hydraulic fluid tank reservoir could no longer receive accurate warnings. This was endangering equipment reliability and operator safety. It was also creating new risks of created unforeseen costly repairs and downtime.



Enhancing application suitability

Upon request, the customer returned the damaged parts to Gems. During failure analysis, both Gems and the customer were keenly aware of the proven twenty-year track record of the LS-7 for in-process reliability. In fact, the model was still very effective within multiple other applications. The question then became: What was unique to these new failures? A comprehensive analysis uncovered that they only occurred within abnormally high shock and vibration environments. Further complicating matters was the fact that the LS-7 was already a widely specified component within multiple customer end system designs. Because of this, it was simply not feasible to change the existing bill of materials (BOM).

To resolve, Gems created a ruggedized version of the LS-7. An electroless nickel plating was added over the original die-cast zinc body for improved corrosion and wear protection. The wiring harness was also strengthened for higher shock and vibration resistance. Design of the ruggedized LS-7 also fit the exact design footprint and price point of its original model. The new units were subjected to stringent design and performance validations, including durability and fatigue testing, to ensure their continued reliability within extreme environments. Now offered as a standard product, the ruggedized LS-7 is a prime example of how Gems can quickly evolve its products to meet ever-evolving customer requirements.

Delivering value for investment

Just as the process begins with a question, at Gems, it ends with one, too. Questions like, “How did that sensor work out for you? How was your experience with us? How can we improve? Is there anything else we can do to help?” Gems delivers each solution with a total commitment to customer value for investment. That can take various forms, whether it’s a standard catalog part backed by nearly six decades of field-proven excellence, VA/VE applied for time and cost savings, or hands-on custom engineering support of a complex solution. Value added benefits can also be passed along in the form of continuous quality improvement initiatives. When it comes to solving difficult customer problems, it is that continued investment in people, products and processes that makes Gems a uniquely qualified resource.

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