Industrial Hoses Couple Up With RFID

A company embeds RFID tags in the hose couplings its makes so that couplings and hoses can be easily tracked and maintained.

By Jonathan Collins

May 5, 2005—For PT Coupling, a manufacturer of industrial hose couplings, embedding RFID tags into its products meant finally being able to provide a way for its distributors and their customers to easily and reliably track and maintain their couplings and the hoses they are attached to.

"We'd been looking for years to develop a way to identify couplings, but we kept coming back to metal tags, which can be scratched or even ripped off when hoses are being used," says Matt Parrish, director of marketing at PT Coupling, which is based in Enid, Okla. Because of their small size (about 1 inch wide and 2 inches long), the metal tags could be inscribed with only a limited amount of information. In addition, the metal tags' information could not be updated in the field. "Then we came across RFID, and it was a great solution," Parrish says.

The company's couplings are attached to hoses used in a range of applications such as chemical and fuel transfer. Although each hose is fitted with two couplings, only one coupling needs to carry an RFID tag in order to track the use and maintenance of that hose.

The 125 kHz passive RFID tags, which are circular in shape and about a half an inch in diameter, are placed into a cavity machined into the coupling at PT Coupling's factory in Enid. A specially designed backing is placed in the hole to minimize radio interference from the metal on the operation of the tag. Once placed on the backing, the tag is then surrounded by high-strength epoxy used to fill the cavity. After the epoxy has cured, the coupling is tested for tag readability and is then shipped to the distributor.

Each tag has 2 kilobits of memory, which enables it to store information about the coupling such as age, maintenance and certification history, when it was last inspected and when it should be inspected again.

"We selected 125 kHz tags because we need to be able to get a reading when the tags are embedded in metal couplings and in very heavily metallic areas," says Chris Gelowitz, VP development at InfoChip. The company says it gets about a half-inch read range from the tags.

Since October, PT Coupling has been offering couplings with RFID tags embedded within them to its distributors, who attach those couplings to hoses and sell the finished assemblies to end users. The distributors also sell the Comprehensive Hose Information Program (C.H.I.P.) system developed byInfoChip Systems, a Canadian company based in Wetaskiwin, Alberta. The system features software developed by InfoChip and also includes readers and other hardware. The software includes Tracking Manager, an online database managed by InfoChip, which tracks and updates details of every tagged coupling sold.

For end user companies, the C.H.I.P. system comprises InfoChip's Tracking Manager application as well as PDAs equipped with RFID readers. The application on the PDA manages the reading and encoding of the

coupling's RFID tag as well as maintains the PDA's database of information on the tag's coupling and hose. The C.H.I.P. system's RFID-enabled PDAs can read and update data on the RFID tags. The PDA then stores that new data and synchronizes it over an Internet connection with the InfoChip database, which is accessible to PT Coupling's customers and distributors. The system also ensures that all the key data related to a hose is stored on the coupling's RFID tag so it can be read and acted on in the field.

InfoChip's Assembly Desktop—also part of the C.H.I.P. system —is a PC-based system that allows hose distributors to use the RFID reader to quickly register and record detailed information about the hoses they sell. In addition, when hoses come back for maintenance or repair, distributors can quickly identify the hose and the coupling and see their service history.

According to PT Coupling, its RFID-enabled couplings cost no more than its traditional metal-tagged couplings. The company sells the entire package to its distributors, which then sell the end user software and services to their customers. However, InfoChip works with the distributors to help price each sale. InfoChip says that it can customize its software to support a range of installations and that pricing for its software varies accordingly. The company estimates that a standard system tracking 200 to 400 hoses fitted with RFID-enabled couplings would cost an end-user around $5,000, plus a 15 percent annual software maintenance fee. The PDAs with RFID readers are priced at $1,000.

InfoChip and PT Coupling aren't the only companies using RFID in couplings and hoses. Colder Products offers its 13.56 MHz smart coupler system, which comprises a reader in one coupling and a tag in another, so that mismatched couplings can communicate to help keep unauthorized liquids from being introduced into storage containers or dispensing systems (see RFID Protects Liquid Assets).

InfoChip says it plans to expand its offering to include the management of other equipment such as valves and pumps for the oil and gas industry.