

## Applying RFID to chemical tracking: managing freezer items

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### The challenge

Hazardous materials that require refrigeration pose management challenges in tracking shelf life and maintaining proper storage temperature. Such chemicals (e.g., certain sealants and adhesives) are typically stored in multiple freezers or refrigerators, but often these products get lost underneath other stacked or bagged chemical containers and expire before they are ever used. This leads to large amounts of hazardous waste, which then becomes extremely expensive to dispose, not to mention the cost of the product itself.

To combat this problem, a team at RFID Global Solution developed a patented solution to help manage such inventories, which operate at extremely low temperatures, called the *SmartFreezer*.

### The *SmartFreezer* solution

The *SmartFreezer* allows chemical managers to access real-time inventory information, without ever opening the freezer. Suppliers are able to increase their own efficiency by gaining visibility into their customer's inventory, without traveling to customer premises. By gaining access to real-time information about such inventory, procurement officers are able to anticipate purchasing needs with greater accuracy and efficiency. An optional temperature sensing unit is also available to provide real-time monitoring of freezer temperatures and can send alerts to maintenance and operations staff.

### How does it work?

First, suppliers affix a passive RFID label onto the products to be tracked. Then, they scan the RFID labels to create and send an advanced shipping notice (ASN). The product is then shipped to the customer, who can deploy an automated receiving process (matching the products to the ASN). The products are placed in freezers that have been fitted with patented RFID inserts (see below for details). The RFID system can be configured to automatically update ordering systems, as well as trigger alerts of expiring material. All information can be viewed and tracked through a web-based user interface.

### Getting started: *SmartFreezer* inserts and RFID Labeling Solutions

Getting started with the *SmartFreezer* solution is rather simple, but presents some upfront costs. The first modification is to retrofit the freezers currently used for chemical inventory storage. Each refrigerator/freezer is equipped with a special *SmartFreezer* insert that is custom made to fit the freezer. The insert comes with a unique antennae embedded into the product, as well as a reader that is external to the freezer. The system is designed to read 100% of tagged products within the freezer, whether the products are bagged or stacked. To ensure a positive read-all, product is tested to validate read effectiveness. If additional sensor technology is needed, the *SmartFreezer* can be outfitted with temperature sensors or humidity sensors. The retrofit cost for an existing freezer unit will vary by size, type and quantity, but costs will likely range from \$5,000 on up.

### Working with chemical suppliers

The customer must work with its chemical suppliers to coordinate proper labeling with the RFID technology. Suppliers generally choose to purchase a new printer that has the capability to print the RFID embedded tags and captures the information for their own systems. RFID printers cost approximately 25-35% more than standard printers.

The upfront costs of getting started with a *SmartFreezer* system should be weighed against the benefits: efficiencies created by better information and better product management that result in significant savings. One aerospace company saved millions of dollars using the *SmartFreezer* technology across an entire airframe. The table below provides a summary of the range of benefits from a *SmartFreezer* system.

Table 1: *SmartFreezer* value and benefits

Benefit	Details
Inventory Accuracy	<ul style="list-style-type: none"> <li>▪ Better inventory management</li> <li>▪ Better utilization of resources, right sizing enterprise system (freezers and product)</li> <li>▪ Reduced waste due to better shelf life management</li> <li>▪ Reduced handling of hazardous materials</li> </ul>
Order Management	<ul style="list-style-type: none"> <li>▪ Fewer transactions</li> <li>▪ Reduced order lead time</li> <li>▪ Reduced manual recording and reporting</li> <li>▪ Reduced errors</li> </ul>
Managed Cost Control	<ul style="list-style-type: none"> <li>▪ Reduced WIP inventory (just in time delivery)</li> <li>▪ Optional supplier managed inventory (VMI)</li> <li>▪ Streamlined receiving process</li> <li>▪ Reduction of unplanned demand</li> </ul>
Streamlined Communications	<ul style="list-style-type: none"> <li>▪ Automated tracking (supplier to customer)</li> </ul>
Reporting Data	Product inventory list, inventory by freezer, product inventory aging by freezer, total inventory aging, total daily usage, daily usage by freezer, total expired sealant, expired sealant by freezer, waste counts by product
Hazardous Waste Tracking	<ul style="list-style-type: none"> <li>▪ Tagged sealant and other tagged waste</li> <li>▪ Minimizes employee exposure</li> <li>▪ Accurate counts (expired product, used sealant)</li> <li>▪ EPA reporting</li> <li>▪ Disposal management</li> </ul>

In addition, the *SmartFreezer* can withstand extreme temperatures ranging from -70°F to 158°F.

### RFID Global Solution

RFID Global Solution was founded by a team of some of the most experienced RFID engineers in the industry representing more than 160 years' combined experience. RFID Global Solution focuses beyond compliance to design and implement RFID solutions that creates value for customers. RFID Global Solution's team deploys RFID solutions with the confidence and certainty that only comes from their combination of "in the trenches" experience and high-level systems understanding. These systems include both active, passive and GPS related solutions for indoor and outdoor asset tracking as well as personnel management.

For additional information on the *SmartFreezer* or any other RFID related need please contact David Eagleson, RFID Global Solution at [dave.eagleson@rfdgs.com](mailto:dave.eagleson@rfdgs.com) or 410-544-4087, or Ron Rose at [ron.rose@rfdgs.com](mailto:ron.rose@rfdgs.com) or 210-497-1403.