

RFID Snuffs Out Inefficiencies at Tobacco Plant

At its cigarette factory in Calcutta, ITC passive RFID tags help monitor tobacco moisture content at each stage of production.

By Claire Swedberg

Oct. 19, 2007—Indian cigarette manufacturer ITC markets several cigarette brands. To ensure the quality of its products, the company must monitor the tobacco's moisture content at each stage of production, from raw material to the finished product. Traditionally, workers at ITC's Calcutta plant had to weigh tobacco samples and manually mark paper docketts (tickets) accompanying the samples during processing. Eight months ago, the company deployed an RFID system to streamline the moisture-monitoring operation. As a result, says Durga M. Dash, ITC's quality control manager, the manufacturer has reduced operator man-hours on the production floor by 40 percent.

Determining the moisture content in tobacco is a priority for cigarette manufacturers, because the tobacco leaves must reach a specific low moisture level to be considered cigarette-quality. To ensure the tobacco reaches that moisture level, the product must be heated and weighed several times. The moisture level is generally documented by taking a sample of tobacco leaves, manually weighing it and then writing the weight on the docket. The paper ticket then accompanies that sample throughout the production process.

At the end of each day, approximately 400 docketts are manually input into an Excel spreadsheet that analyzes the data. The resulting information, available the following day, is used not only to ensure the tobacco's quality but also to catch problems involving any machines that might allow the moisture content to get too high.

However, the company explains, the manual system of recording and inputting data was too slow, time-consuming and prone to errors. Sometimes, the paper tickets got lost or personnel wrote in the wrong weight or other data, and keyed the incorrect information into the spreadsheet.

The RFID system now in place was designed, developed and integrated by Tata Consultancy Services (TCS). With this system, a tobacco test sample is collected and placed in a palm-sized plastic cylindrical container shortly after the tobacco arrives in the warehouse. The container comes with an RFID label provided by TCS, embedded with a passive 13.56 MHz Texas Instrument RFID tag complying with the ISO 15693 standard and providing 1 kilobyte of read/write memory. The tag and label are temperature-resistant and wash-proof.

Warehouse staff members use a handheld RFID interrogator provided by Psion Teklogix, with a Tagsys reader module, to encode data onto the plastic container's RFID tag. The worker follows drop-down menus on the reader to select the tobacco's location within the plant, as well as the original source of the tobacco, the machines it will be sent to, and the time and date. That data is written onto the RFID tag, says Abhijit Ghosh, TCS' RFID practice manager, and data regarding the sample's movements and weight are stored on it as well.

Employees take each sample-filled plastic container to one of three workstations containing a scale wired to an RFID interrogator custom-built by TCS. The plastic container is placed on the scale, which is located

beneath an interrogator antenna, while an empty ovenproof, tagged metal container is positioned beneath a separate antenna. The reader captures the ID number on the plastic container's RFID tag, as well as its weight, then encodes that data to the metal container's RFID label, which has already been encoded with that container's tare weight (its weight when empty). The tobacco is then transferred from the plastic container to the metal container, which is weighed before being put in an oven along with the batch of tobacco from which the sample was taken.

After four hours in the oven at 110 degrees Celsius, the sample-filled container, along with the rest of the tobacco, is removed, and the container is weighed once more. Its new weight is encoded onto the RFID tag, and the interrogator captures all data stored on the tag. That information is then uploaded via a cabled connection to the company's back-end system so ITC can evaluate the results.

"The RFID system has changed the way sample data are recorded and moved with the samples," says Ghosh. "It has not only enabled ITC to discard the paper dockets, but has also benefited by saving the operator's samples-collection time."

RELATED_ARTICLES According to Dash, greater accuracy has been another benefit since the system eliminates the need for manual writing and data entry. "The implementation of the RFID system has made operations more reliable and functionally robust," he says, bringing about what he calls "a paradigm shift in striving for process efficiency."

Training production workers was managed easily, Dash says, who notes, "The quality team of ITC went through a smooth and structured process of induction into using RFID systems. The hands-on training imparted to them from the beginning has helped the team in executing their day-to-day operation of the systems effectively."

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