

Study Says HF Rules for Pharma Items

In tests performed by ODIN Technologies, HF tags outperformed UHF tags for use on pharmaceuticals at the item level.

By Mary Catherine O'Connor

Mar. 29, 2006—Within RFID item-level tagging applications, specifically within the pharmaceutical industry, both ultra-high frequency (UHF) and high frequency (HF) tags are being tested and deployed in the supply chain. This is causing some debate among vendors and end users regarding which technology is better suited to item-level tracking of pharmaceutical products.

ODIN Technologies, a Dulles, Va., systems integration firm, has just released "Battle of the Frequencies," a report based on a battery of tests the company conducted using three commercially available UHF EPC Gen 2 tag models and four commercially available HF tags compliant with the ISO 15693 specifications. ODIN ran the tags through five separate performance tests and against three pharmaceutical use cases, for a total of eight test categories. Overall, according to the report, HF tags outperformed the UHF tags. HF tags performed best in five of the categories, while UHF tags won in two. In one category, the two frequencies performed equally well.

ODIN collaborated with its clients and partners in the pharmaceutical industry to choose these use cases, which are germane to drug manufacturers, distributors, regulators and retailers alike. Systems integrator Unisys sponsored the test.

The report bases its findings on the performance of the two frequency types as a whole—it does not provide any information as to how specific tag models performed, nor does it name the tag models tested. Rather, it lists only the manufacturers of the tested tags: Symbol Technologies, Texas Instruments, Omron, RF IDentics and UPM Raflatac. No prototypical tags—such as UHF tags designed for item-level, near-field reading, but not yet commercially available—were allowed in the benchmark.

Patrick Sweeney, ODIN Technologies' president and CEO, says these details were kept out of the report because the firm wanted to base the results of the tests on the outcome of a frequency as a whole, rather than on the performance of individual tag models. "The big 'so what?' of the report is that it can help those who need to tag pharmaceuticals to know which camp to support," says Sweeney. He adds that the report will show end users that overall, even the poorest-performing HF tag models on the market today are better suited to item-level pharmaceutical tagging than currently available UHF tags.

For the use case tests, ODIN utilized three different sample pharmaceutical form factors: a standard pill bottle, a standard bottle of a liquid medicine and a blister pack with a foil backing and Mylar cover. All of the tagged products were in motion during the tests, traveling at 15 feet, 25 feet or 75 feet per minute, based on suggested metrics from the pharmaceutical company representatives ODIN consulted prior to the testing.

The first use case was inline verification of tagged product moving down a conveyor. The second was item-to-case verification, in which ODIN attempted to read both the closely packed item-level tags inside

cases (quantity of 48 per case), and the case tags, while the cases were moving through an interrogation portal. The third use case was based on reading pallets of tagged items and cases moving through a portal reader.

UHF tags performed well in only two of these use cases, Sweeney explains, whereas HF performed well in all three. The tests are based on hardware and tags available to end users today in production quantities, he notes.

In addition to putting tags through the three use-case tests, ODIN ran 100 samples of each tag model through five different RFID performance tests, carried out on static tags in a lab environment. The company measured read distance, or how the strength of this link changed as the distance between the tag and interrogator grew; how the orientation of the tag to the interrogator's antenna affected the tag being successfully read; how nearby materials (such as metal and conductive liquids) affected read rates; the speed at which the tag could be encoded; and the tag quality, or how consistently each 100-tag sample performed.

According to ODIN, measuring the tag's orientation sensitivity to the antenna is especially important, because distributors and other supply chain partners may not have control over the orientation of tags on bottles of drugs cased and enclosed on a pallet transported through the supply chain.

ODIN is selling the report through its [Web site store](#) for \$395. The report details how each test was conducted and how tags of each frequency fared. Sweeney says that while HF is the clear winner today, "that might change as innovations [in tag design and capability] come to market. HF is an older technology," he says, "but there have been more innovations in UHF technology in recent years that allow more capabilities than [UHF] used to have."

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