

issued several patents. In 2013, the two organizations also agreed to bundle and commercialize the technology jointly; as a result, later that year Mohajeri founded Rockledge, Florida-based Hysense Technology LLC and began production and marketing of the product as Intelligiment.

Benefits

Hydrogen is one of the most widely used gases in industry. Oil refineries utilize the gas to turn crude oil into gasoline and diesel, and manufacturers mix hydrogen with argon to weld stainless steel. Chemical plants also use the element as a building block for creating ammonia, a key ingredient in fertilizer, and methanol, an important constituent in many polymers.

And just as NASA is keen on monitoring leaks from a safety standpoint, so is every other industry that deals with the highly reactive and flammable gas. Mohajeri says the traditional technologies that companies work with have their drawbacks.

“Stationary sensors have a shelf life and, depending on where they’re located, they might not be able to detect every area that’s susceptible to a leak,” she explains. “And the handheld ones require technicians to walk around and listen for a beeping sound. What if there are two flanges near the beep that are very close together? It could be that one is leaking and the other one isn’t, but the sensor can’t make out the difference.”

That’s where the company’s Intelligiment tape comes into play. “With this new technology, all they have to do is wrap the two flanges with the tape, and they’ll directly home in on the source of the leak,” she says, noting that it’s easy to spot the problem area, as the beige tape will turn black.

As for how long it takes the tape to undergo the chemical-induced color change, if 100 percent hydrogen is being used, results come within 10 seconds. Mohajeri adds, “We also tested leaks that contain as little as

1 percent hydrogen, and we saw a reaction time of three minutes, which is very good.”

Although the product has been commercially available for only a short period of time, and despite it being unlike any gas detection technology that came before it, a number of companies across the swath of industry have taken to using the tape, and many of them have already placed a second round of orders.

Adding to the technology’s promise, in 2014 *R&D Magazine* awarded HySense, Kennedy, and UCF an R&D 100 Award for its development, and in that same year HySense won a \$100,000 first-place award at the CAT5 Innovation Competition, which honors and supports early-stage companies that offer “powerful, disruptive” technologies.

“I’m very hopeful, as all the indications are telling me that this product will be a success,” Mohajeri says.

The technology was also shown interest by the automobile private sector as the Space Agency carried out potential applications discussions with several car companies in their development of hydrogen and hydrogen fuel cell automobiles. NASA also contributed its expertise to the Hydrogen Highway project: an initiative led by the Department of Energy that aimed to proliferate hydrogen refueling stations in order to make such automobiles commercially viable.

According to Kennedy lead polymer scientist Martha Williams, public and private partnerships such as these, along with the technology’s successful commercialization, play an important role in the Agency’s overall mission.

“We’re always thinking in terms of the big picture,” she says. “As we solve problems for NASA, we’re also figuring out the best ways to transfer the technology successfully. This detector tape is a great example of that.” ❖

