

Faster, Less Expensive Approach to Fluid Meter Design

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NASA's Marshall Space Flight Center in Huntsville, Ala., has patented a faster way to determine flow rates of liquids through channels or pipes. Its balanced flow meter provides 10 times the accuracy of standard orifice-based fluid flow meters, resulting in significant cost-savings to industries such as gas and oil refinery.

"This technology can pay for itself in two weeks by reducing the amount of power needed to pump fluids through the meters and cutting the power costs to a company," said Anthony Kelley, a lead research engineer in the integrated systems health management and sensors branch of Marshall's Engineering Directorate.

This new approach to meter design improves on the older, standard orifice plates -- meters that regulate how much and how fast fluids move through a channel or pipe -- which are used extensively in refineries, chemical, power and pharmaceutical plants. While the standard plates have just one hole through which fluids flow, the balanced flow meter has multiple holes and requires less straight pipe to function.

Originally developed for NASA's Space Shuttle Program, gas and oil refineries are already applying and taking advantage of the technology for their industries.

"This is another outstanding example of our work with a variety of industries to move aerospace technology to the public and private sector while supporting NASA's goal of improving life on Earth," said Sammy

Nabors, commercialization lead in the Marshall Center's Technology Transfer Program Office. Nabors predicts this technology will have a lasting positive impact in the gas and oil refinery industry.

The technology also has none of the moving parts that are in other metering systems, making it more reliable, less likely to malfunction and less expensive to manufacture. Other significant benefits include considerable noise reduction and its ability to be used in different systems without modifying the hardware. There are millions of standard orifice plate installations worldwide, and successful commercialization will result in replacement of those with balanced flow meter plates.

Licensed in August 2003, the technology was developed by NASA and A+Flowtek of Kingwood, Texas, a small, minority-owned business. It was originally designed for use in space shuttle main engines, where the liquid oxygen flow meter enabled better system monitoring. Further development between NASA and A+Flowtek made this invention a viable, enabling technology in many commercial applications.

The balanced flow meter technology was conceived, created and tested through the Marshall Center's Technology Investment Program. The program, managed by the Engineering Policies and Programs Office, fosters the development of emerging in-house technologies.

Source: NASA

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