

# ICOM North America Secures Three New Patents, Strengthening Innovation Leadership In Alternative Fuels

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*ICOM Strengthening Innovation In Alternative Fuels*

DETROIT, MI, UNITED STATES, April 23, 2025 /EINPresswire.com/ -- [ICOM North America \(www.icomnorthamerica.com\)](https://www.icomnorthamerica.com), a leader in sustainable energy solutions for the alternative fuels sector, proudly announces the issuance of three new U.S. patents. These innovations reinforce ICOM's commitment to developing advanced technologies that improve engine performance, reduce emissions, and expand the potential of alternative fuels.

## Breakthrough in High-Flow Vortex Injection Technology

The first of the newly granted patents, U.S. Patent No. 12,247,534, titled "High Flow Inline Air/Fuel Vortex Injection System for Internal Combustion Engines," introduces a multifuel mixing system designed for natural gas, propane, DME, ammonia, hydrogen, and other fuels. The system uses a high-flow vortex mechanism to optimize air and fuel delivery, significantly enhancing combustion efficiency and reducing emissions across a wide range of engine applications. "With this addition to our dual-fuel system, we're achieving higher diesel displacement and delivering greater fuel savings to the end customer," said Albie Venezia, Director of Technical Services.

## Advanced High-Pressure Fuel Return for Direct Injection Systems

The second innovation, U.S. Patent No. 12,253,042, titled "High Pressure Regulated Fuel Return Apparatus for Engines Using Direct Injection Fuel Systems", offers precise fuel return flow regulation to manage pressure and prevent vapor accumulation in direct injection systems. This technology supports both OEM dedicated systems and adaptation of single fuel systems to bi-fuel (e.g., propane, DME, ammonia, gasoline)—without requiring conversion to a port injection system. "This development enables us to convert certain direct injection engines more effectively and even resolve existing challenges in factory gasoline systems, such as hot restart issues," noted Brandon Thorn, Engineering Manager.

## Safer, More Accessible LPG Fuel Supply Systems

The third patent, U.S. Patent No. 12,163,628, titled "LPG Fuel Supply System with Vapor Lock Prevention," introduces an external fuel pump design for use with standard propane, DME, or ammonia tanks. Unlike traditional systems that require internal tank pumps—often necessitating complete tank drainage for service—this innovation places the pump externally, improving safety, reducing maintenance downtime, and lowering costs. "This system not only

increases safety but also unlocks new applications for liquid propane injection in previously challenging markets, including on-road vehicles and off-road applications such as small engines, generators, and agricultural pumps," added Thorn.

### Strengthening ICOM's Innovation Portfolio

These three patents expand ICOM North America's growing portfolio of proprietary technologies focused on next-generation alternative fuel systems. They position the company to serve a broader range of markets with solutions that deliver improved efficiency, reliability, and environmental benefits. "These patents reflect ICOM's leadership in sustainable fuel technology and open new pathways for growth in both established and emerging alternative fuel sectors," said Venezio.

### About ICOM North America

Founded in 2004, ICOM North America is a leading provider of alternative fuel systems, tanks, and components, specializing in propane Autogas and natural gas solutions. ICOM is a certified new engine distributor for General Motors, a supplier of remanufactured engines, and a parts provider for specialized fleet projects. Committed to innovation and environmental responsibility, ICOM helps businesses and fleets reduce operating costs and emissions.

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