

The Future of High Efficiency Internal Combustion Engines and Flex Fuel US technology

Direct Injection technology is advancing at the leading Original Equipment Manufacturers (OEMs) including General Motors, Ford, and Toyota. The high compression technique provides high performance and fuel efficiency supplanting traditional fuel injection technology for gasoline engines.

New alternative fuel usage standards such as RFS2, the introduction of blender pumps, incentives provided by the Federal Government to OEMs for the production of flex fuel vehicles and the emerging Open Fuels Standards Act in Congress, combine to ensure that high blends of alcohol and gasoline fuels will increasingly become a larger part of the fuels used in our national vehicle park. Currently there are about 10,000,000 vehicles able to operate on higher blends of alcohol fuels (Flex Fuel Vehicles) on the road today. We produce about 12 billion gallons of ethanol today and have hit the blend wall with E10 and E85. RFS requires fuel producers to blend 36 billion gallons of ethanol by 2022. To hit this target, simple math says that the average car will need to consume 30% of its fuel as ethanol.

OEMs are positioning the direct injection technology for these blended alcohol fuels including ethanol and methanol. For example, a new US patent has recently been awarded to Ford providing techniques to more efficiently combust blended gasoline and alcohol fuels in a direct injection engine. The technique further enhances engine efficiency by creating a cooling effect with alcohol that increases pressure in the combustion cylinders. Cooling the incoming air-stream allows for more efficient combustion timing and higher engine compression.

Flex Fuel US believes that the Flex Fuel US patent can have benefits for OEMs desiring to use blended alcohol fuel with direct injection technology. By providing an additional injector directed by the engine control unit with an alcohol sensor, the technique enhances performance by adding supplemental alcohol blended fuel on demand while creating thermal cooling conditions beginning in the manifold. Several years of field experience on law enforcement, professional racing, and defense vehicles demonstrate the performance impact and durability of the technology. Laboratory results at development partner Roush Laboratories and the DOE Oak Ridge National Laboratory test results prove out the performance claims Flex Fuel US has made.

The system will work for all internal combustion engines and can be applied with very low development and production costs. This technology has great promise shifting the world's dependence on petroleum and the threat of climate change due, to a large part, to vehicle emissions.