

Is it Safe to Run Gasoline Through my Large Volume Prover?

by Mike Sikula, NYS Weights & Measures and Val Miller, NIST OWM

Weights and Measures inspectors regularly test vehicle tank meters (VTMs) on trucks delivering combustibles such as fuel oil, kerosene and diesel fuel but may also test trucks delivering flammables like gasoline (forward flammables will be referred to as gasoline). There are always important safety issues that need to be addressed when testing petroleum, however, gasoline is particularly dangerous and additional precautions must be taken. One of these precautions is the electrical system on the prover. Field standard volumetric provers must comply with the requirements of the National Electrical Code, any applicable National Fire Protection Association (NFPA) requirements for use around flammable liquids and gases, and any other regulatory requirements for working around and with hazardous materials. For older provers or provers that have been refurbished, compliance to these specifications may be uncertain and should be verified before use.

Basic petroleum product properties:

Product	Flash Point	Hazard	Volatility
Fuel Oil	100 °F	Combustible	Low
Gasoline	-45 °F	Flammable ¹	High

¹ gasoline is easily ignited by heat, sparks or flames.

When metrologists calibrate a large volume prover they verify the volume and do several checks evaluating the construction of the prover for metrological stability but do not verify the explosion proof status of the motor and electrical connections as they are not electrical experts. When a metrologist seals and issues a calibration certificate for a large volume prover they are not endorsing its use for a specific product (e.g. gasoline), they are only certifying the volume delivered from the device when filled to the reference mark.

NIST Handbook 105-3 (2010) "Specifications and Tolerances for Graduated Neck Type Volumetric Field Standards" specifies requirements for large volume provers. Section 4.7 "Other Requirements" of 105-3 addresses safety-related items, including grounding and wiring. The explosion proof status of a prover may be impacted by electrical repairs and/or refurbishing. Each state/jurisdiction should evaluate their prover(s) and decide on its appropriate use. If a prover has limitations it is advisable to clearly and conspicuously mark the prover with the limitation.

Handling gasoline in any quantity poses safety concerns due to the flammability of the vapors. Handling gasoline in large quantities (e.g. 100 gallons) is dangerous and proper precautions must be taken. Before testing a meter using gasoline as the test liquid make sure you have the right equipment and are properly trained. Do not take unnecessary risks!