

# Gravimetric Flow Measurement in the Automotive Industry

Gravimetric based fuel flow determination is a growing market segment. The demand for optimized engines with lower fuel consumption and environmental pollution drives the need for sensors with higher precision and improved dynamic data recording. Yet leak flow or pulsing volume measurement is extremely difficult if not impossible with conventional piston-, gear-, turbine-, ultrasound- or vortex based flow rate sensors. They usually allow a flow rate determination down to 1ml - yet 1ml is 1g and we offer 0.001g and 0.0001g weighing modules!

The **fast, precise and rugged METTLER TOLEDO weighing modules** are an excellent product fit for the automotive testing industry. They are available as standard or intrinsically safe versions (FM Class I, Div.1), with optional wash-down option and are perfectly suitable for integration into test systems for pumps, injectors, valves and engines.



WM6002x-Lcl weighing module

#### Disadvantages of Traditional Sensors:

- Since they measure flow volumetrically, temperature and pressure variations must be corrected for, or prevented.
- They must be corrected or recalibrated if the fuel density varies, or if different types of fuel are tested (e.g., methanol, gasoline, and diesel)
- Because fuel density is usually not constant, in-line densimeters are often installed so that a constant density correction factor can be calculated. These in-line analyzers come with their own set of accuracy and reliability problems.
- Because most of these meters are positive displacement devices that contain finely machined moving parts, they are susceptible to damage by particulates in the fluid stream. Extensive upstream filtering is required to protect these meters.

#### Advantages of Gravimetric Measurement:

- Measurement of mass flow directly. Therefore, the need for pressure and density correction is eliminated.
- These meters accurately measure the flow of different fuels (even compressed gases) without recalibration.
- Maintenance concerns are alleviated because these sensors, unlike other types of devices, are resistant to damage by solids in the process stream.

For more information, visit [www.mt.com/AutomatedWeighing](http://www.mt.com/AutomatedWeighing), contact your local METTLER TOLEDO sales person or the Automated Precision Weighing Manager, Dominic Meyerhans (<mailto:Dominic.Meyerhans@mt.com>).