

APPLICATION NOTE

Online continuous process monitoring
Blends of liquid fuels

INSTRUMENTS FOR
CLEANER APPROACHES

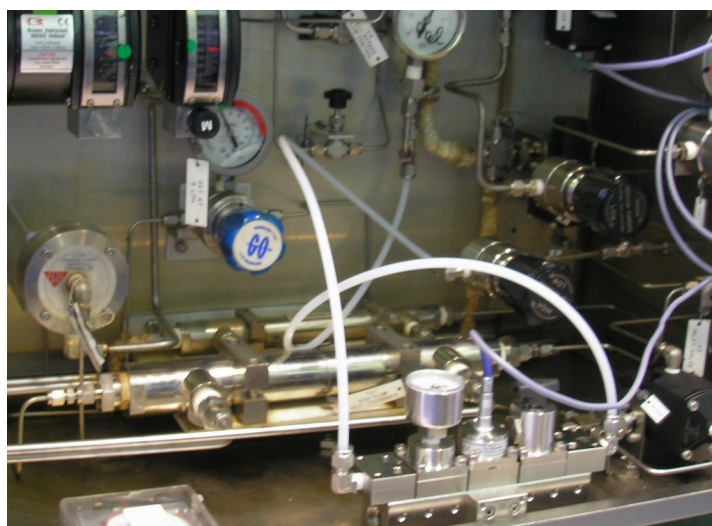


Real-time inline density measurements of light refined products are required by international regulations prior to product distribution.

This note details how the DEVIL® monitors with success fuel blends, optimizing the quantity of additives to be added to comply with regulations and thus - reducing production costs.

Liquid fuels – gasoline, kerosene, diesel fuel
Extracts (petroleum), distillates

Product	DEVIL ATEX
Mech. configuration	Bypass production line – NPT fittings
Measurements	Density, Temperature
Communication	USB to Computer / 4-20mA to SCADA
Acquisition rate	1Hz then 1/10Hz

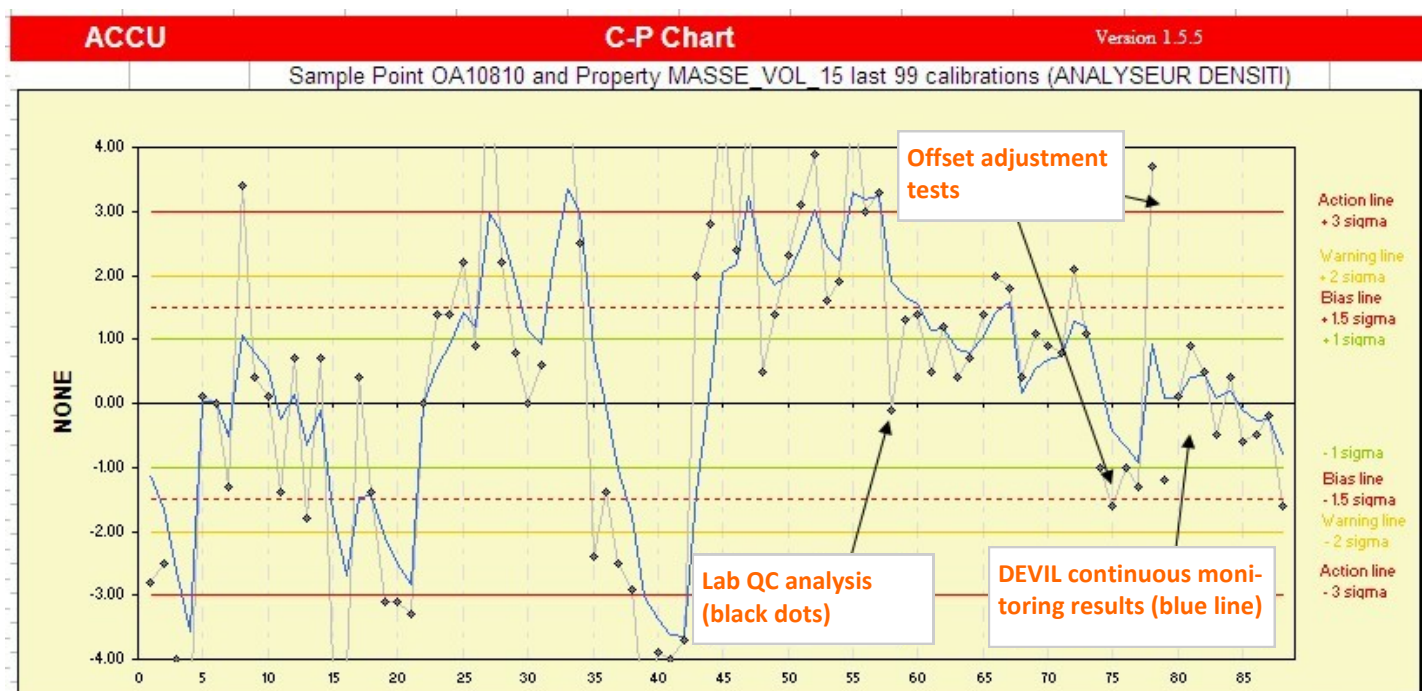


DEVIL® integration (courtesy of EXXONMOBIL)

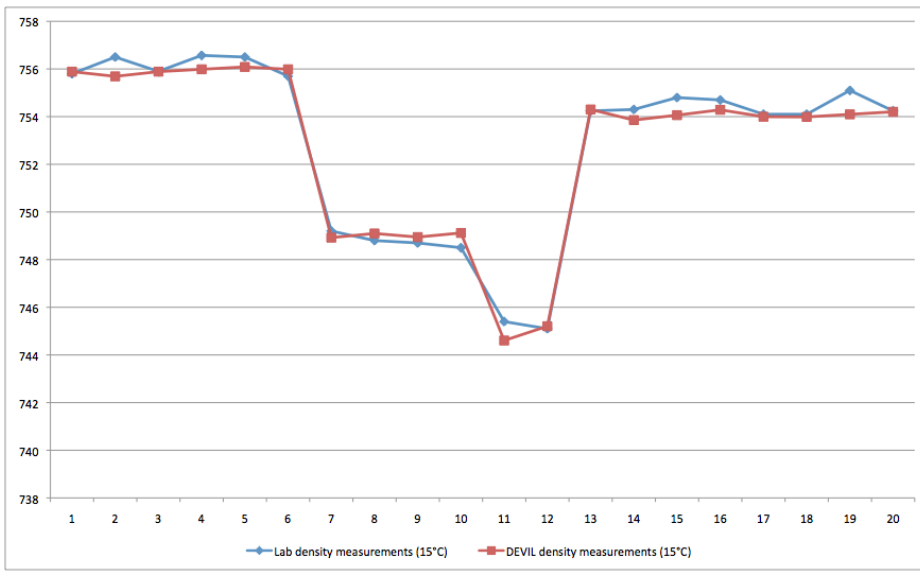
Liquid fuels are light refined products obtained by crude oil distillation. They find applications through automotive & aviation grades such as gasoline, kerosene, diesel fuels.

Efficiently monitoring fuel blending process in real-time

The DEVIL® has been installed inline, together with a chromatography equipment. The device had direct communication to a local computer, while sending density + temperature acquisitions in a 4-20mA format.



As man can see from the graph above, DEVIL® successfully tracked blend density variations while production was running. The device achieved excellent performances, achieving an average accuracy far below $1\text{kg}\cdot\text{m}^{-3}$ compared to laboratory results.



Following a nominal 3kg.m⁻³ offset adjustment, the DEVIL® (red curve) tracked blend density with an outstanding accuracy, confirmed by ASTM measurements done at the QAQC lab (blue curve).

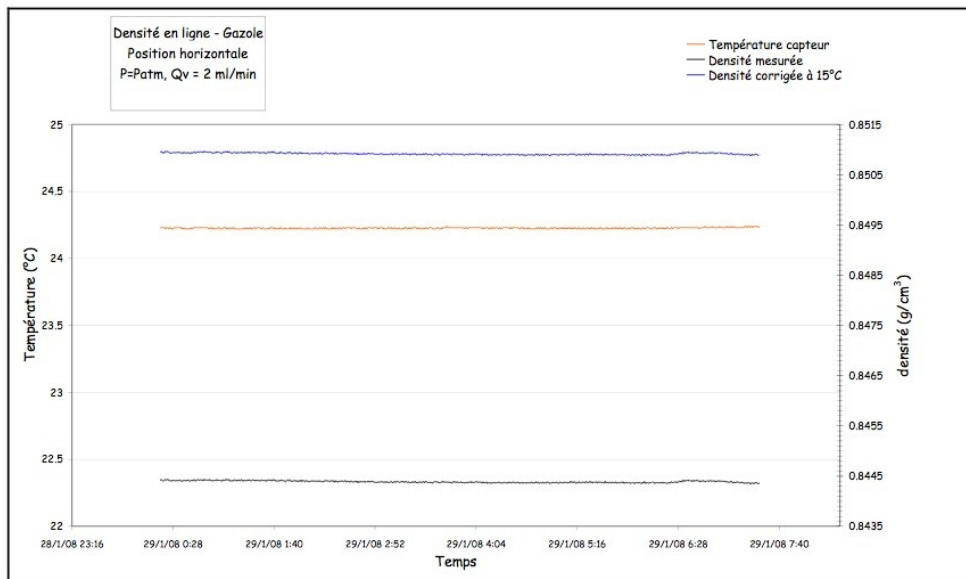
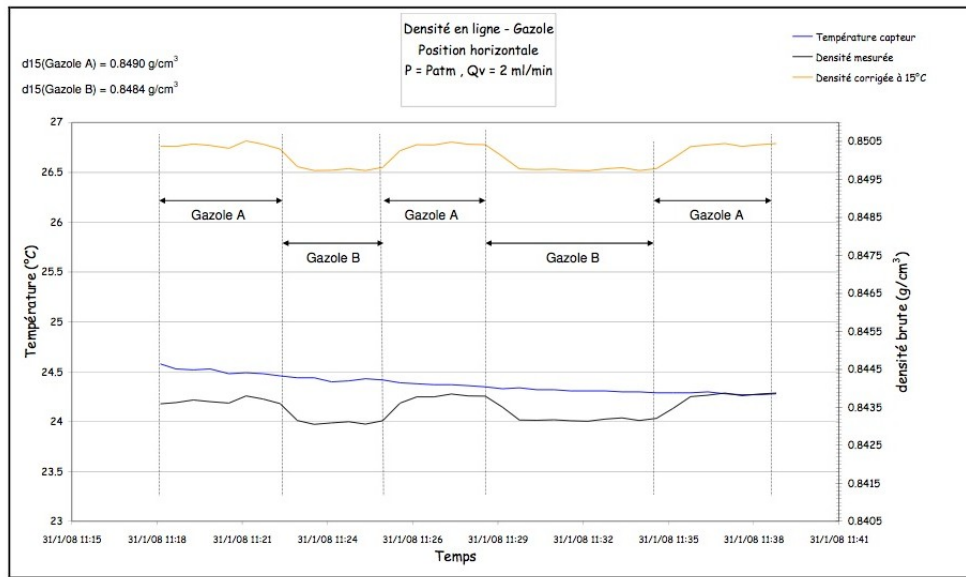
Partners



Real-time temperature compensation, outstanding repeatability & stability

Two gasoil blends were alternatively proposed to the device, each time identified with an excellent repeatability.

A real-time temperature compensation at 15°C was uploaded to the DEVIL®, providing in real-time ASTM compliant results (see right top & bottom).



Achieved performances

Repeatability

$5 \cdot 10^{-5}$ g.cm⁻³

Accuracy

$2 \cdot 10^{-4}$ g.cm⁻³

In continuous process conditions

In conclusion...

The DEVIL® showed its capability to drive in real-time liquid fuel blends. Through exceptional performances achieved in real-time, embedded temperature compensation and thanks to both digital & analog communication modes, DEVIL® is now considered as a tool of reference for fuel monitoring.