



APPLICATION REPORT Oil & Gas

Mass flow measurement of oil products when loading and offloading tank lorries and ships

- Equipping a loading system for tank lorries with Coriolis mass flowmeters
- Simple integration into existing SCADA, filling control and control system
- Custody transfer measurement in accordance with MID MI.005 and API 5.5 Level A

1. Background

SC Klaipėdos Nafta is one of the largest oil ports on the Baltic coast in Lithuania. Crude oil and oil products are delivered by ships and freight trains and then loaded for further transport onto tank lorries and ships. Tank ships with a shipping volume of up to 100000 t can dock and the port capacity is 500 rail cars. The storage volume is approx. 400000 m³. A new filling system suitable for custody transfer was necessary in order to increase the capacity for light oil products when loading tank lorries from tank cars.



Freight train

2. Measurement requirements

The new loading system for tank lorries had to be suitable for custody transfer and able to generate all financial data. Additional requirements included: simple installation, superior accuracy and smooth integration of the new system into the existing SCADA and filling control and control system. Measurements must be based on the European MID in accordance with MI-005 and API 5.5 Level A.



Offloading a tank car

Product benzene E95 (= 95% ethanol + 5% benzene):

| | |
|------------------------|-----------------------------|
| Density: | 741...791 kg/m ³ |
| Flow rate: | 20...100 m ³ /h |
| Viscosity: | 0.45...1.5 mPa·s |
| Operating pressure: | 4 bar |
| Operating temperature: | -29...+35°C / 84.2...95°F |

3. KROHNE solution

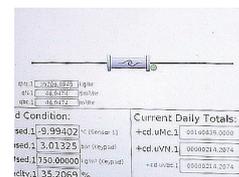
For this application KROHNE supplied 5 OPTIMASS 7300 C mass flowmeters and 2 SUMMIT 8800 digital flow computers. It is very easy to install the OPTIMASS measuring devices in the pipelines as there are no installation requirements. Pipeline vibrations have no impact on the highly accurate measurements. The compact designs of the measuring devices make the electrical connection easier. The devices come equipped with density and temperature measurement as standard. The devices can be started up and operated without any special knowledge. The SUMMIT 8800 is a digital flow computer featuring a large, easy-to-read colour display with multi-colour light control and touchscreen operation. The completely redundant Ethernet is suitable for WLAN when using all common protocols. The SUMMIT 8800 can be used for many different types of measurement.



OPTIMASS 7300 C



SUMMIT 8800



SUMMIT 8800 display

4. Customer benefits

OPTIMASS mass flowmeters from KROHNE offer many advantages such as excellent long-term stability and repeatability, guaranteeing precise measuring results. The devices work extremely reliably. Because OPTIMASS 7300 C measuring devices can measure the mass flow directly, recalibration becomes unnecessary, even with varying process parameters. There is virtually no additional pressure loss due to the single straight measuring tube design of the mass flowmeters. This means that the required pump output is minimal.

5. Products used

OPTIMASS 7300 C (Coriolis Mass flowmeter)

- The only mass flowmeter with a single straight measuring tube available in stainless steel, Hastelloy®, Titanium and Tantalum
- Minimal pressure loss
- Any installation position, self-draining and easy to clean
- High accuracy even when product, viscosity and/or temperature changes
- Reliable measurement of mass and volume flow, density, temperature, concentration as well as liquids with solid content



SUMMIT 8800 (digital flow computer with graphic display)

- Use of state-of-the-art communication and modular design
- Colour graphics with touchscreen and online communication
- Automatic remote read-out with network support
- Increased precision and consistent reduction of recalibration thanks to automatic efficiency control



Contact

Would you like further information about these or other applications?
Do you require technical advice for your application?
application@krohne.com

Please visit our website for a current list of all KROHNE contacts and addresses.



www.krohne.com