



APPLICATION REPORT Oil & Gas

Custody transfer filling of liquid propane

- Measuring system as per MID MI-005 for filling tankers with liquefied gas
- Mass flow measurement of liquid propane
- Space-saving installation with measuring device in straight tube design



1. Background

Knauber, a medium-sized family business, is a specialist in the business of mineral oil and liquefied gas among other things. An energy supplier for industrial enterprises, Knauber operates a loading facility for liquefied gas in the Eifel region, Germany. Tankers with up to 22,000 kg / 48,500 lb of liquid propane can be loaded here.

2. Measurement requirements

In order to properly bill its deliveries, Knauber relies on the use of custody transfer instrumentation. This technology must necessarily comply with the requirements for the continuous and dynamic measurement of liquids other than water, as prescribed in the Measuring Instruments Directive (MID) MI-005.

Medium:	Propane
Measuring range:	10...50 t/h / 367.4...1837 lb/min
Minimum measured quantity:	500 kg / 1102 lb
Temperature:	+10...+25 °C / 50...77 °F
Pressure:	>6 barg / 87 psig
Density:	approx. 0.5 kg/l / 4.17 lb/gal

Until now, Knauber has been using a mechanical flowmeter for custody transfer measurements. However, this device was no longer able to permanently guarantee the measuring accuracy required for the long run. On top of that, the device required a great deal of maintenance and was not designed to directly output the loaded amount of propane in mass (tons per hour) for billing purposes.

In view of this, Knauber tested the use of a Coriolis mass flowmeter that complied with the stringent requirements of the MI-005. They also wanted a device that would enable greater automation of the loading process so that the custody transfer loading computer could be installed and run from a separate control room. The flowmeter had to be able to handle the wide measuring range required and the limited space available.



3. KROHNE solution

Knauber decided on the OPTIMASS 7300. The Coriolis mass flowmeter is approved for custody transfer according to OIML R117 and has MID MI-005 approval based on the European OIML Directive. It was supplied in a compact version featuring a Hastelloy measuring tube (DN 50 / 2"). As the world's only mass flowmeter, the OPTIMASS 7300 boasts a single straight measuring tube and was thus able to be installed very compactly in a confined space. There was no need to take into account the inlet and outlet sections.



Space-saving installation of the OPTIMASS 7300 C in the measuring facility

4. Customer benefits

With the OPTIMASS 7300 C, Knauber has the advantage of a reliable measuring device that completely fulfills the stringent requirements of the standards for the custody transfer measurement of liquids other than water. The high linearity of the mass flowmeter as well as the associated maximum measuring accuracy allow for highly precise measurement in the specified measuring range while reducing costs for calibration.

The KROHNE instrument can be operated with no maintenance. This keeps the customer's workload and operating costs to a minimum. As a result, the overall costs compared to a mechanical flowmeter are significantly lower. The space-saving straight tube design of the OPTIMASS 7300 was an added bonus for the customer. When Knauber was rebuilding the existing measuring facility, it was able to forego the considerably more expensive pipe constructions they would have needed to install, for example, had they used a U-shaped mass flowmeter or a different measuring device with inlet and outlet sections.

5. Product used

OPTIMASS 7300 C

- Coriolis mass flowmeter for liquids and gases
- High levels of accuracy for custody transfer (MID 2004/22/EC MI-005)
- Flow rates up to 430,000 kg/h / 15,800 lb/min
- Best in class for zero stability
- Modular electronics concept
- Optional heating jacket



Contact

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



www.krohne.com