



APPLICATION REPORT Food & Beverage

Hydrostatic level measurement in edible oil storage tanks

- Reliable stock management of vegetable oils
- Rugged, fully welded gauge pressure transmitter for improved inventory monitoring
- Cost-effective replacement of faulty pressure gauges



1. Background

Special Refining Company (SRC), located in Zaandam, the Netherlands, is an independent contract refiner dedicated to refining vegetable oils and fats for third party customers as a service. To meet current and future challenges in food safety, SRC built a new refinery and upgraded their existing one to the latest technology. This gives their clients certainty in yield, quality and food safety.

2. Measurement requirements

SRC has multiple storage tanks for a multitude of crude and refined edible oils. The tanks are closed, but non-pressurised designs, i.e. the edible oil products are stored at an atmospheric pressure. Thus, there is no need for differential pressure level measurement.

Initially, these narrow storage tanks had been equipped with a basic pressure transmitter for hydrostatic level measurement mounted at the tank bottom. However, the diaphragm material of the pressure transmitter was not up to the task as it tended to fail after a while due to acids in the crude vegetable oil. Leakages had an impact on the measuring performance and caused a vast deviation in tank level readings. SRC was therefore searching for a cost-effective, yet robust and reliable replacement.



Storage tanks for vegetable oils

3. KROHNE solution

The customer opted to replace the pre-mounted pressure transmitters with the OPTIBAR PM 3050 for hydrostatic level measurement in the vegetable oil storage tanks. The KROHNE pressure transmitter is so compact as to allow a 1:1 exchange of the previous instrumentation without additional pipe work. It combines excellent measurement performance with outstanding robustness.

The fully welded stainless steel (1.4404 / 316L) design makes the pressure transmitter very robust and resistant to the present process conditions. The stainless steel diaphragm of the device provides corrosion resistance to the fatty acids present in the vegetable oils. The digital linearisation of the OPTIBAR PM 3050 enables a stable and accurate measurement signal. Due to its integrated temperature compensation, thermal effects on the sensor are eliminated.

The compact pressure transmitter was installed with a threaded connection. Front-flush installation was not necessary but could have also been provided together with a wide range of hygienic process connections if requested. The 2-wire device transmits its readings via the 4...20 mA output to the customer's PLC for automated inventory monitoring.



Hydrostatic level measurement of vegetable oil with the OPTIBAR PM 3050



Storage tanks equipped with KROHNE pressure transmitters

4. Customer benefits

The KROHNE pressure transmitter turned out to be the ideal replacement of the previously mounted instrumentation. Its compact design allowed for seamless integration into the existing infrastructure. There was no need for additional installation efforts and long downtimes. SRC benefits from a more reliable stock management. Faulty level readings due to leakages are no longer an issue. Unlike the previously used pressure transmitter, the rugged and welded design of the OPTIBAR PM 3050 resists wear and leakage for long-term stable operation, keeping maintenance costs low and plant uptime high.

KROHNE provides a wide range of pressure transmitters from a single source – from ultra-compact to process pressure and differential pressure transmitters. This involves the whole scope of supply from technical advice, product selection and sizing to engineering and manufacturing to delivery, installation and after-sales service. A wide range of wetted materials is available for applications with different edible oil products, e.g. soy oil with a high concentration of salt in which stainless steel diaphragms can no longer be used.

5. Product used

OPTIBAR PM 3050

- Pressure transmitter for general pressure and level applications
- Compact design with recessed or flush metallic diaphragm and optional display module
- Stainless steel diaphragm
- Many wetted diaphragm seal materials for edible oil applications



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.

