Laser-View Technologies

Smart non-contact measurement solutions for industry

Application Brief:

VISCOUS BULK MATERIALS

LASER LEVEL MONITORING IN A PISTON TANKER TRUCK

INDUSTRY: Transportation of viscous bulk materials

APPLICATION: Noncontact piston location monitoring on a piston tanker

SUMMARY: The Dimetix DLS-CH30 laser distance sensor has been used to retrofit piston trailers commonly used to transport viscous materials, such as peanut butter, chocolate, and grease. The DLS laser monitors the position of the internal piston as the tank is filled or the tank's contents are pumped out under pressure. The Dimetix laser has proven to be a reliable non-contact method of monitoring piston location for piston tanker operators.

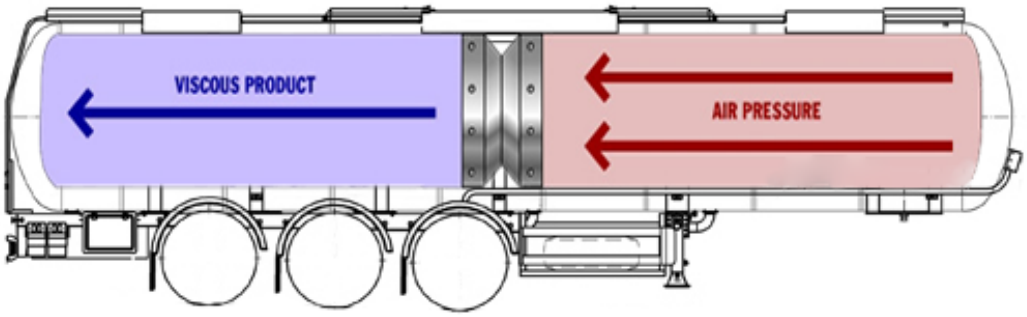
Overview

A number of technical challenges contribute to unreliable and inaccurate piston location readings, including extreme temperatures, variations in diameter along the length of piston tanker, and concerns about contamination in food processing and transportation applications. Accurate and reliable piston location monitoring is important for inventory control both when emptying and filling a tanker—overfills occurring when the piston contacts the front head can also cause structural piston damage.

Solution

A piston tanker is a tanker truck with an internal piston running its length. Cargoes of highly viscous bulk materials are unloaded from the cylinder by applying air pressure to the piston that travels the length of the cylinder. In this application, a Dimetix DLS-C series laser distance sensor is mounted on the trailer to measure the piston location.

- One Dimetix® DLS-CH30 laser distance sensor
- A pair of displays (1 front, 1 rear)



The laser used in this application is class II eye safe and measures with a system accuracy of 3 mm, but can also be equipped with a laser capable of up to 1 mm accuracy. The laser is also equipped with an internal heating unit to extend its operating temperature range from -40°F to +122°F.

Results

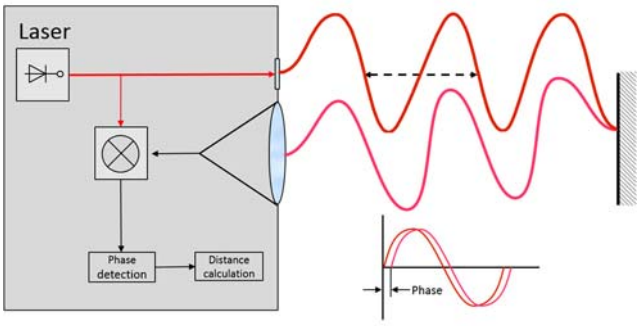
Integrating the Dimetix laser sensors on the piston tanker improved process quality and reduced waste by accurately monitoring piston position so that the material volume unloaded could be maximized. The system used in this application also provided the following advantages:

- No contact with the material being transported
- Measurement range extends the entire trailer length
- Minimal maintenance – no breakable moving parts on laser
- Simple analog monitor displays level of material in tank

Performance technology

The DLS-B series laser distance sensor operates on a principle called phase shift. The laser signal is reflected directly back to the device. This technique provides high accuracy at a significantly lower cost than traditional laser triangulation methods and is generally more accurate than simple time of flight methods.

Since the transmit and receive signals come back straight to the device, the laser can be mounted in tight spaces, making retrofits simpler. The device is also capable of measuring with 1.5 mm accuracy, even up to 500m. Distances over 65m usually require a special reflective plate affixed to the target.



Please contact **Laser-View Technologies** today to discuss your next application.

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