



# APPLICATION REPORT Chemical

## Level measurement of DOP plasticizer in a tank

- Storing organic raw material for delivery purposes in supply tanks
- Monitoring the volume of an agitated medium with Guided Radar (TDR) technology
- Installation in a high temperature (HT) environment of an ATEX Zone 2



### 1. Background

The Czech chemical company DEZA a. s. produces various raw materials for the construction and automotive industry. One of these organic compounds is dioctyl phthalate (DOP), a softening agent (plasticizer) widely used in the production of imitation leather or mould plastic.

In order to ensure the highest possible quality of the plasticizer, the raw material is always separated from its secondary components first and then filled into a tank for delivery purposes. As a back-up for that tank, DEZA uses various supply tanks. If these tanks run empty, the whole delivery process comes to a standstill. Therefore, it is important for DEZA to monitor the volume in the tanks.

### 2. Measurement requirements

Over the past three years DEZA has tried to master this application using a radar sensor from a competitor. However, this level meter was unable to produce stable and reliable measuring values. It was particularly sensitive to disturbances in the pre-installed stilling well. For this reason the customer decided to test an alternative measuring principle in one of its supply tanks. This instrument was to fit well into the existing infrastructure of the stilling well and had to be able to meet the challenging measurement environment of the application, particularly the agitator at the bottom of the supply tank.

<b>Medium:</b>	Dioctyl phthalate (DOP)
<b>Range:</b>	
(Level)	0.8...3.8 m / 2.6...12.5 ft
(Volume)	0...23 m <sup>3</sup> / 0...812 ft <sup>3</sup>
<b>Temperature:</b>	160...180°C / 320...356°F
<b>Tmax:</b>	200°C / 392°F
<b>Pressure:</b>	0.5 barg / 7.2 psig

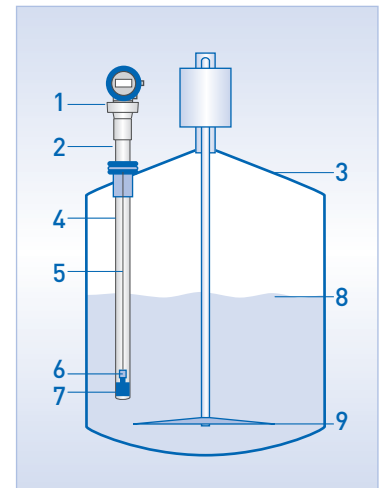
Given that the DOP plasticizer is easily flammable, DEZA also required the level meter to be ATEX Ex d-approved.



## 3. KROHNE solution

All requirements of this application were met by the Guided Radar (TDR) level meter OPTIFLEX 2200. The device was delivered as a high temperature (HT) version and fitted on the tank roof with a flange connection. The housing of the OPTIFLEX 2200 was mounted horizontally to make the display screen easier to read. The  $\varnothing 2$  mm / 0.08" single cable probe of the level meter was installed into the existing 4.05 m / 13.3 ft long stilling well ( $\varnothing 36$  mm / 1.4"). The cable probe of the OPTIFLEX 2200 has a counterweight with a stainless steel centering piece screwed into it. There was approx. 0.5 m / 1.6 ft of space underneath the stilling well leaving some clearance for the agitator.

The TDR (Time Domain Reflectometry) technology of the OPTIFLEX 2200 allows the device to measure level independently of physical property variations such as pressure changes. The measuring values are transmitted via a current output (4...20 mA) to a control room, where the DOP stored in the tank is permanently monitored.



1. OPTIFLEX 2200 C 2. HT extension  
3. Tank 4. Stilling well 5. Cable probe  
6. Counterweight 7. Centering piece  
8. Level of medium 9. Agitator

## 4. Customer benefits

With the help of the OPTIFLEX 2200 DEZA can continuously monitor the level and volume in the supply tank. The stable and relevant values provided by the level meter ensure the customer is always aware of the amount of DOP that can still be filled into the final tank. This enables the company to avoid delivery issues.

Unlike the competitor devices, the KROHNE level meter with its integrated DPR algorithm is able to eliminate dynamically false reflections caused by environmental disturbances. Therefore, it was not needed to rebuild the tank, despite obstacles such as the agitator. The Guided Radar (TDR) fits best with the pre-installed stilling well environment. Commissioning and installing the device was a simple process. It was not necessary to empty the tank. Only the length of the probe had to be adapted and a quick configuration was carried out using PACTware™.

DEZA is very satisfied with the performance of the OPTIFLEX 2200. Having already had positive experiences with other KROHNE meters, the customer once again benefitted from the technical support of the local KROHNE sales engineers.

## 5. Product used

### OPTIFLEX 2200 C

- 2-wire loop-powered HART® TDR level meter for liquids and solids
- Horizontal and vertical housing position to suit every installation
- The remote converter can be installed up to 100 m / 328 ft from the probe
- DPR (Dynamic Parasite Rejection) to eliminate false reflections caused by environmental disturbances and product build-up
- Measuring range up to 40 m / 131 ft
- SIL2-compliant according to IEC 61508 for safety-related systems



## Contact

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



[www.krohne.com](http://www.krohne.com)