



## APPLICATION NOTE Chemical

### Temporary flow measurement of monomers at plastics plant

- Detecting water pollution in the process flow of principal materials
- Ultrasonic clamp-on flow measurement without process interruption
- Gain and velocity of sound as main parameters

#### 1. Background

A producer and supplier of plastics operates a manufacturing plant in western Europe where it processes raw materials for end products such as fibre. Most of these principal materials are monomers which are processed to polymers. Before the polymerisation process the raw materials are stored in large tanks.

#### 2. Measurement requirements

In order to be further processed to basic materials for plastics, the customer distributes its monomers to other production facilities in the plant. Before the liquid raw material is processed through the pipeline, water is placed on the fluid as a layer in order to prevent the monomers from polymerising at such an early stage through contact with oxygen. For most of the time, the water has no further impact on the medium. Occasionally, however, the water enters the process flow, which negatively affects the quality of the principal product. In order to find out when water enters the process and pollutes the raw material, the customer needs continuous data about the medium. Therefore, the customer required a temporary measurement of the corresponding volume flow and indication about possible water pollution so as to be able to take action and optimise the process.

### 3. KROHNE solution

KROHNE delivered the OPTISONIC 6300 P, a portable ultrasonic clamp-on flowmeter designed for temporary flow measurement of liquids. The device is fitted on a DN 80 / 3" stainless steel vertical standpipe and used for a singular flow measurement to detect water pollution in the raw liquids. The OPTISONIC does this by measuring the gain as well as the velocity of sound. When measuring the principal material the device generates a strong signal with low gain. As water pollution results in a multi-phase liquid, the electronics of the OPTISONIC 6300 P automatically amplify the received acoustic signal. The deviations in gain provide an indication of the amount of water in the pipeline. The velocity of sound calculated by the clamp-on flowmeter is also used to find out which liquid is running through the pipe (which can also be just water from time to time). Given that the velocity of sound of water ( $\pm 1480$  m/s) varies greatly from the velocity of sound of the principal material the OPTISONIC 6300 P easily identifies the fluid running through the pipe.

### 4. Customer benefits

The OPTISONIC provides various diagnostic functions that enable the customer to quickly react to flow changes. Whenever the flow of the monomers is mixed with water, immediate steps can be taken to regulate the process flow. In doing so, the quality of the raw materials can be maintained while money is saved. With the OPTISONIC 6300 P there is no need for expensive process interruption to install inline flowmeters. Thanks to the mobile data management using the integrated data logger, the portable clamp-on device also allows for long-term analysis of flow data by comparing current and existing readings. The measured values can be easily transferred to a PC via USB.

### 5. Product used

#### OPTISONIC 6300 P

- Portable, battery powered ultrasonic clamp-on flowmeter for liquids
- Suitable for all industries and a broad range of process conditions
- For tube diameters from DN 15 (1/2") to DN 4000 (160")
- No process shutdown required for installation
- Quick start-up and ease of installation (installation wizard)
- Several diagnostic parameters available
- Data logger function providing data for detailed analysis.



### Contact

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