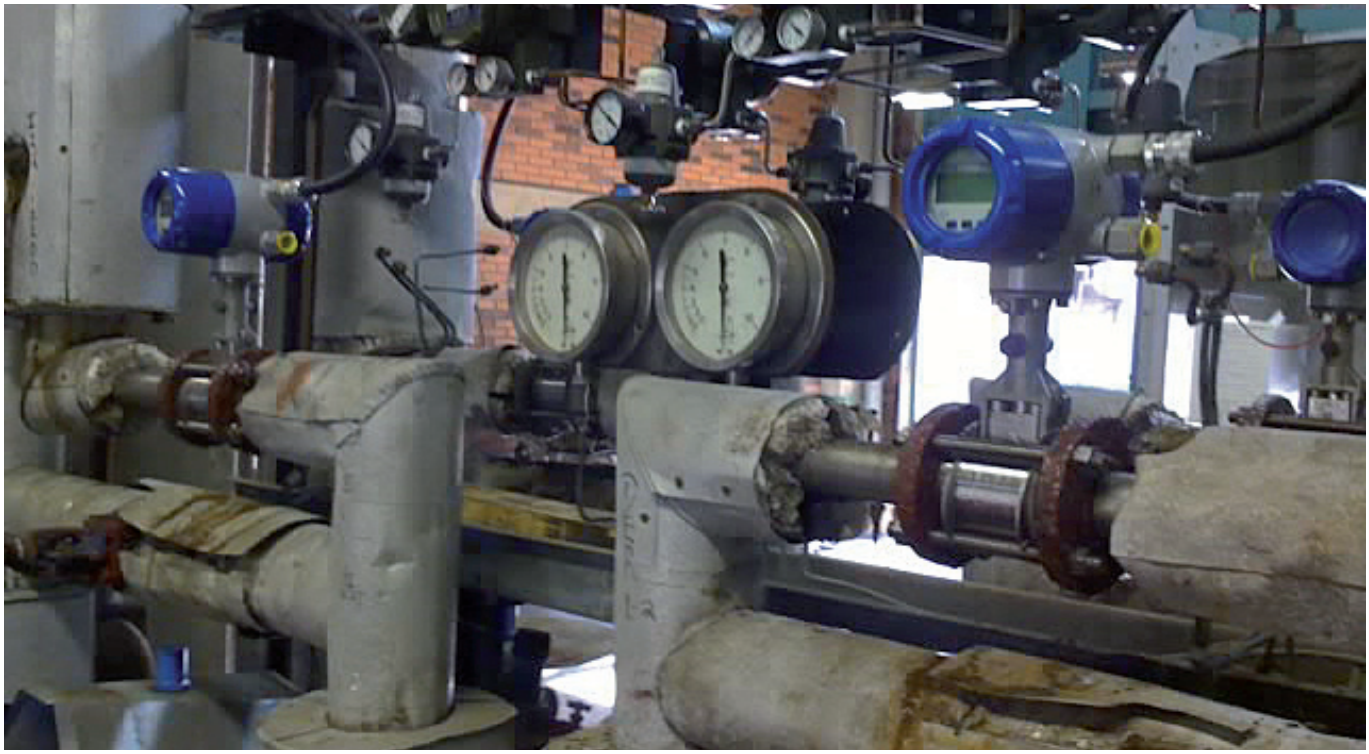

APPLICATION NOTE Chemical

Measurement and balancing of saturated steam

- Output of the steam consumption for each production line
- Conversion of the steam quantity with fluctuating process points
- Replacement of differential pressure measurements

1. Background

A manufacturer of ceramic materials in southern Germany, supplies saturated steam to its production lines through its own steam network.

2. Measurement requirements

The customer was looking for a solution for a total of 15 measurement points for recording the mass flow rate of saturated steam. The following operating conditions prevailed:

Volume flow	22,6...500 kg/h
Pressure	7 bar
Temperature	170 °C
Density	4.17 kg/m^3

The steam consumption figures for each production line have to be control system for internal calculation purposes. To do this, it is necessary to convert the measured flow quantities into a mass flow at fluctuating process points.

KROHNE

3. KROHNE solution

For this application, KROHNE supplied 15 OPTISWIRL 4070 C DN25 Vortex flowmeters with integrated temperature compensation for measuring the saturated steam. With the given operating conditions, the device's measurement range is 1:22; the measurable flow velocities lie between 3 and 80 m/s. OPTISWIRL measures the flow and the product temperature. The operating density on the saturated steam graph is calculated online, based on the product temperature. The mass flow can be calculated and output.

4. Customer benefits

As the customer has already successfully deployed several measurement systems from the Duisburg-based company, the company was given the job of handling these measurement tasks. Until now, the customer had deployed orifice and differential pressure measurement systems whose measurement range however, was not sufficient to measure the minimum and maximum volume flows accurately enough. Thanks to the larger measurement range offered by the OPTISWIRL 4070 C, the quantity of steam actually delivered can be recorded much more accurately. The flow quantities are displayed directly on-site in kg/h or t/h through the integrated temperature compensation. The measuring devices are maintenance-free removing the need for regular dismantling for servicing. Alongside the low purchase costs, the most convincing factor was the very much simpler installation of the compact measuring devices as compared to that time consuming installation needed for the differential pressure measurements.

5. Product used

OPTISWIRL 4070 C

- 2-wire Vortex flowmeter for the measurement of gases, vapours and liquids
- Integrated temperature compensation (pressure compensation optional)
- Suitable for wet gases, e.g. saturated steam
- High precision and long-term stability
- No pressure loss
- Process temperature: -40°C...+240°C
- Maintenance-free

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