

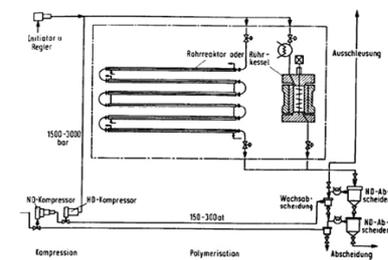
Flow Measurement of Ethylene Gas

Non-invasive measurement, therefore pressure independent. No wear and tear through solid content in the liquid, no need to stop the process for service and maintenance of the equipment.

Measuring Task		Method	Medium	
	Clamp-on flow measurement	 Ultrasound		Ethylene gas

Features	Measuring Task.....?
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- Medium: ethylene (=ethene) gas
- Pipe:
outer diameter: 90 mm (3.5 in),
wall thickness: 26 mm (1.0 in),
inner diameter: 38 mm (1.5 in)
- Material: special steel
- Temperature: 60°C (140°F)
- Pressure: 1500 to 3000 bar
- ATEX Zone 1
- Vibrations due to pressure surges



High pressure polymerization scheme



The Variotix mounting rail ensures a robust installation of the clamp-on transducers

Polyethylene plastics are formed by polymerization of the hydrocarbon compound ethene (C₂H₄) commonly known as ethylene. Soft polyethylene (LDPE), most commonly used as a packaging material, is produced in a high pressure process. During this process, ethene gas is compressed in a multiple stage compressor to a working pressure of approx. 2100 bar and sent into a tube reactor where the addition of an initiator starts the polymerization. Exact information concerning the flow in each single line is paramount for effective process management.

Due to the high pressure levels involved, the conventional turbine flow meters have a high failure rate and require high maintenance. The wax particles found in the delivery flow and which will be later separated out often cause damage to mechanical measuring systems. Furthermore, peak pressures of up to 3000 bar occur during the production process.

Solution.....!

Non-invasive ultrasonic flow measurement provides the ideal solution for this measuring challenge. The transducers are simply clamped onto the pipe's outer surface and do not come into mechanical contact with the medium inside the pipe. Thus the measurement is not disturbed by wax particles in the flow and no extra costs arise to accommodate the high process pressure. The ultrasonic measuring system can be installed without interruption of the production. Process interruptions due to failure of mechanical measuring equipment belong to the past.

Advantages.....+

- Precise non-invasive measurement
- No extra costs to accommodate the high process pressure
- Rapid measurement setup without process interruption
- Measurement is unaffected by vibrations or pressure surges
- Unaffected by wax particles
- No drift of measurement values caused by variations in the static pressure
- No need to stop operations for inspection, servicing, or maintenance of the measuring system

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