DENSITY MEASUREMENT FOR RESID HYDROCRACKERS

Ideal measuring solution for advanced process control

QUALITY MADE IN GERMANY

BERTHOLD

LEVEL AND DENSITY MEASUREMENT
ON RESID HYDROCRACKER REACTORS

The resid hydrocracking process is becoming more and more attractive to refiners as it allows a higher conversion rate than other heavy oil conversion processes. It is used to crack heavy fractions to achieve lighter and more valuable products. Resid hydrocrackers are challenging to operate due to the complex set of reaction vessels, catalyst handling and separating units, and elevated temperatures and pressures in the presence of hydrogen. Radiometric measurements from Berthold offer enhanced control for these units, and provide additional insight into the process that can be used to increase production.

Measuring level and density at different elevations

To achieve optimal control of the cracking taking place inside the reactor, the level of hydrocarbons, catalyst and gas is monitored by means of multiple density measurements spread along the height of the reactor. The radiometric density gauges from Berthold respond quickly and differentiate even the smallest density changes, down to a resolution of ≤0.002 g/cm³.

Berthold's solutions for hydrocracking processes

In addition to the reactor, typical applications for Berthold's measurement solutions include various thick walled vapor/liquid separators, catalyst handling vessels, distillation towers and in-line densities at high temperature and pressure. Radiometric level and density measurements ensure effective vapor/liquid separation in the hydrocracker's separation section as pressure and temperature decrease across the various separators. Such measurements are also used in the catalyst section of the hydrocracker to ensure the proper amount of catalyst is added or withdrawn from the reaction system to maintain effective cracking.

Measuring principle

In simple terms, a radiometric measurement is a system consisting of a source that emits radiation and a detector that can detect that radiation. Gamma radiation is attenuated as it passes through the vessel and its contents. The amount of attenuation depends on the fill level: the higher the fill level, the less radiation reaches the detector. The measurement is not influenced by pressure, temperature, viscosity, colour or chemical properties of the product to be measured. This results in a high level of reliability combined with freedom from maintenance, even under harsh operating and environmental conditions.

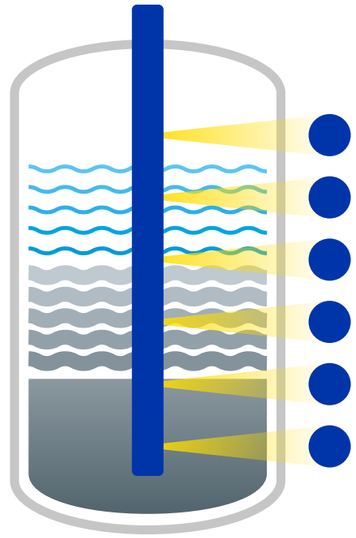
[SIL 2] [SIL 3]

Customer Benefits

- Maximum process transparency
- Reliable control over the cracking/separation processes
- Increased throughput and operational availability
- Efficient utilization of catalyst using advance process controls

Technical Features

- Multiple point sources inserted in dip pipe on individual cables
- Highly accurate density reading, resolution of ≤0.002 g/cm³
- Quick-responding measurement
- Optional SIL 2 / SIL 3 certified



Multiple point sources inserted in dip pipe and density detectors mounted outside the reactor

THE EXPERTS
IN MEASUREMENT TECHNOLOGY

Berthold Technologies stands for excellent know-how, high quality and reliability. The customer is always the focus of our solution. We know our business!
Using our varied product portfolio, our enormous specialized knowledge and extensive experience, we develop suitable solutions together with our customers for new, individual measurement tasks in a wide variety of industries and applications. Berthold Technologies is specialised in radiometric process measurements for 75 years. This is our core competence with state-of-the-art and cutting edge products and solutions covering a vast range of industries and applications.

We are here for you – worldwide!
The engineers and service technicians from Berthold Technologies are wherever you need them. Our global network assures you fast and above all competent and skilled assistance in case of need. No matter where you are, our highly qualified experts and specialists are ready and waiting and will be with you in no time at all with the ideal solution for even the most difficult measurement task.

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