

Application Bulletin

Delayed Coking

Continuous Coke Drum Level Measurement

Recent trends in the continuous coking industry include a modernization of coke drum level control. The Gamma Transmission method of continuous level measurement is a field-tested, reliable model for improving the delayed coking cycle.

Berthold Technologies offers the most sensitive, most stable, and most reliable gamma transmission level measurement system on the market.

Using the **LB 490 TowerSens** Detection System, the following benefits are realized:

- **Increased operator control due to more accurate level indication**
- **Faster coking cycle times**
- **Cost savings due to more efficient anti-foam usage**
- **Protection against foam-over**



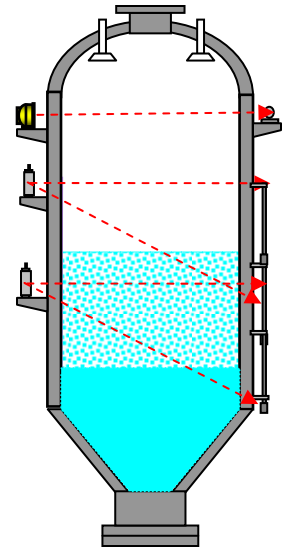
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Principles of Operation:

The **gamma transmission** method utilizes the principle of attenuation of radiation as product level increases. Radioactive sources are mounted on one side of the drum, with radiation detectors mounted on the other side. As radiation is blocked by oil, foam or coke, the drum level can be ascertained. The Berthold Coke Drum Level Measurement system consists of a 2" diameter solid scintillation detector for measuring continuous level with a separate high level alarm system for added security against a foam-over. A single LB490 TowerSens can reliably measure a span of **up to 26 ft**. The detector is extremely sensitive (much more sensitive than flexible scintillators), and provides early information on foam level increases, as well as an accurate indication of oil level. This provides operators a high degree of confidence throughout the process cycle including filling, foaming, anti-foam addition, foam collapse, drum switch, quenching, and draining.



The Berthold Advantage:

Solid scintillators have always been the most accurate detectors for use in radiometric level systems. They have traditionally been the most costly as well, especially on applications with long measuring ranges. This has changed with the 2006 release of the LB 490 TowerSens. Berthold now offers the benefits of a solid scintillator at a **price that is competitive with flexible scintillators**, with the additional advantages that come from using Berthold technology:

- **Reduced Source Activities** (5 to 15 times less than flexible detectors : Lighter & less expensive shields : Less concern over NRC "Quantities of Concern")
- **Lower & Safer Radiation Levels**
- **Improved Linearity up to 26 ft**
- **Guaranteed Temperature Stability** (+/- 0.5% | -40 to 122 °F) - especially important with changing ambient temperatures that occur during coking cycles