

HOW RADIOMETRIC MEASUREMENT SOLVES TOUGH PROCESS MEASUREMENT CHALLENGES

Ronan Measurements Division supplies the process control industry with leading-edge Radiometric Measurement Systems that provide non-contact measurement solutions for the harshest environments.

RADIOMETRIC MEASUREMENT

Application

Radiometric Measurement, also called "nuclear measurement", is a safe and effective, non-contact method to measure liquids or solids in harsh process environments. Applications include:

- Continuous Level Measurement
- Interface Level/Density Measurement
- Continuous Weight Scale Measurement
- Point Level Monitoring
- Density/Mass Flow Measurement

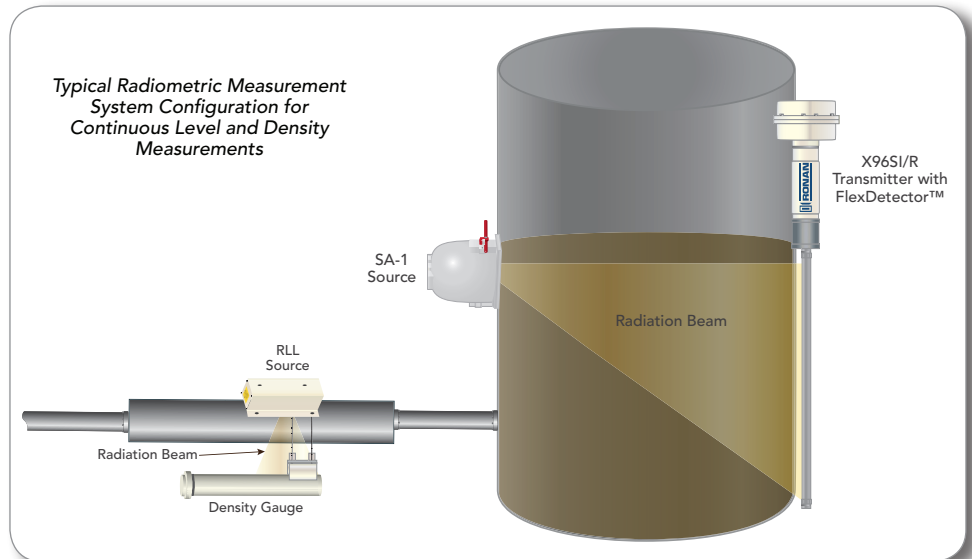
Radiometric Measurement is ideal for industries including Mining and Aggregates; Power; Refining, Oil and Gas; Chemical; Metals (steel, aluminum, etc); Pulp and Paper; Dredging; Cement; Glass; and Food and Beverage.

Problem

Direct contact measurement systems cannot be used in process applications that require the measurement of materials that are caustic, corrosive, toxic, carcinogenic, explosive, or sterile; abrasive or highly viscous; held at extreme temperatures or under high pressure; in a process flow that is violent or constantly changing or contained in a vessel with an internal obstruction, such as an agitator.

Solution

A Radiometric Measurement System consists of a gamma source and holder (also called a "nuclear gauge"), detector and transmitter. The gamma source is mounted externally to the vessel and emits energy through the vessel walls directed towards the detector, also mounted externally, on the opposite side of the vessel. The gamma energy reaches the detector in an inversely proportional relationship to the level of material in the vessel. The detector measures the amount of energy and sends a signal to the transmitter, which correlates the signal to a measurement and displays the information in user-specified units.



Because the entire system mounts externally to the vessel or pipe, it is unaffected by harsh processes or process materials, or vessels with internal obstructions. The system can be installed and maintained while the process is running without downtime, vessel modifications, risk of accidental release, or the need for specialty construction materials.

Other benefits of Radiometric Measurement:

- The system is safe with all gauges meeting "As-Low-As-Reasonably-Achievable" (ALARA) guidelines
- The material being measured is not affected by the gamma energy
- System components do not disturb flow profile
- Interference in measurement readings is eliminated and component wear and maintenance are reduced because system components do not come into contact with the process material or conveyor
- The system can be installed in areas where space is limited
- Installation does not require expensive materials or modifications to vessels or pipes
- Provides a cost effective method for weight measurement as installation and maintenance costs are minimized

Summary

For challenging process measurement applications, where conventional measuring devices are unsuitable, Radiometric Technology enables accurate and reliable measurement.

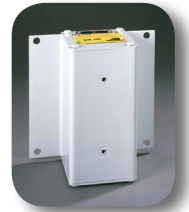


RADIOMETRIC MEASUREMENT SYSTEM

Ronan offers the widest variety of source holder and detector configurations on the market, including source and source holders to meet every need, detectors configurable to any shape or length, and a transmitter that is compatible with all configurations and can be customized for special applications.

Source Holders

Ronan is the only manufacturer to offer the revolutionary **Radiation Low Level (RLL)** source holder. The RLL uses up to 100 times less gamma energy than comparable gauges. The RLL is a generally licensed device that does not require the stringent documentation, training or handling procedures of other systems.



RLL Source Holder



SA-1 Source Holder

The **SA-1 and SA-8** general purpose Source Holders are suitable for a wide range of applications requiring an externally mounted source. These source holders accommodate higher source activity while providing shielding which meets all international standards for radiation limits. The SA-1 and SA-8 contain a rotary shutter with the option to include a remote actuated shutter with shutter position indicator.

Detectors

Ronan employs three types of scintillation crystals: Fill Fluid, Plastic, and Sodium Iodide for ultra low-level fields. Our patented FlexDetector™ offers unique advantages in reliability and sensitivity while the lightweight construction eliminates the need to employ cranes and rigging for installation. This design is ideal for horizontal or spherical vessels, or on parts of the vessels where space is limited.



Scintillation Detector

Transmitters

Ronan's new **X96SI/R Transmitter** is compatible with all Ronan scintillation detectors. The X96SI/R can be integrally-mounted in an explosion-proof housing or remotely mounted in the field or control room. The system is fully Ethernet capable allowing configurations, software updates, and data logging to be completed easily through the user's PC using a standard web browser. Built-in intelligence provides a range of features including automatic compensation for vapor density changes, foam, gasses, and process build-up; automatic source decay compensation; auto calibration; radiation discrimination; state of the art dynamic tracking of process fluctuations; data logging and event recording; adjustable time constant; and empty vessel alarm.



X96SI/R Transmitter
with FlexDetector™



X96S Transmitter

Ronan also offers our proven **X96S Transmitter** which features the fastest processor in the industry. The modular design allows for low cost expansion of outputs and measurement variables. Calibration and configuration is simple and can be achieved locally through push buttons, by using the liquid crystal graphic display, or remotely through industry standard protocols. The X96S is compatible with all models of Ronan detectors.

