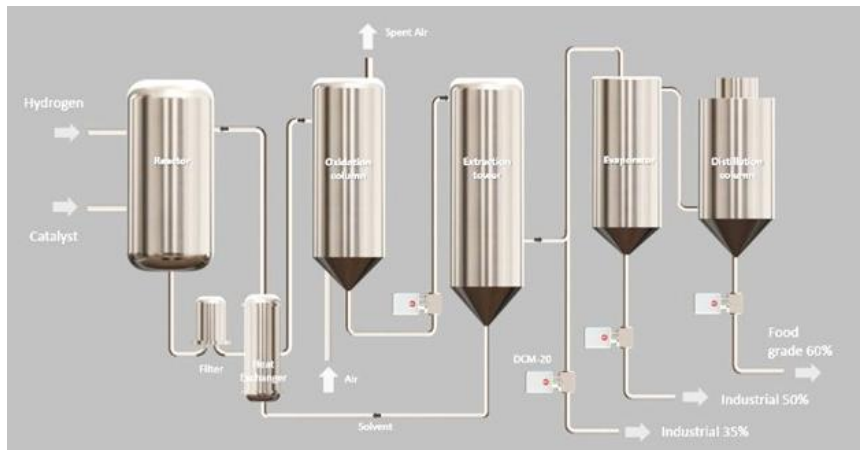




Benefits of R.I. measurement

- Ensures accurate H₂O₂ concentration, optimizing extraction, purification, and distillation.
- Reduces manual sampling, lowering costs and improving process efficiency.
- Improves plant safety and compliance by maintaining consistent peroxide concentration levels, reducing risks associated with improper dosing or impurities.



Overview

Hydrogen peroxide (H₂O₂) is a clear, colorless, and slightly viscous liquid widely used across industries, from food processing to semiconductor manufacturing. It serves as a key chemical in various applications, requiring precise concentration control to ensure quality, efficiency, and safety in production.

Refractive index measurement applications

Hydrogen peroxide is manufactured almost exclusively using the autoxidation (AO) process, which involves the reduction of anthraquinone, followed by oxidation to form H₂O₂. The peroxide is then separated from water via extraction and concentrated to standard commercial strengths ranging from 35% to 65%. The primary purpose of concentration is to reduce storage and transportation costs while also removing impurities such as organic solvents.

KxS Technologies' DCM-20 Process Refractometer is designed for real-time, in-line monitoring of hydrogen peroxide concentration throughout the production process.

It can be installed at key measurement points, including:

- Post-extraction stage:** After peroxide extraction, where concentrations typically range from 30% to 40%, ensuring maximum efficiency in the separation process.

- Distillation control:** During the purification and concentration stage, where H₂O₂ is distilled to its target concentration, the DCM-20 ensures precise control of the distillation column, helping optimize reflux and boil-up rates for improved separation and reduced energy costs.

Instrumentation and installation considerations

Hydrogen peroxide production presents unique challenges, from gas bubbles interfering with measurements to the need for precise concentration control.

The KxS DCM-20 Process Refractometer is designed to overcome these hurdles, ensuring efficiency, accuracy, and reliability in every step of the process. Unlike traditional density-based sensors, which struggle with hydrogen gas bubbles, color variations, and suspended particles, the DCM-20's advanced refractive index sensing technology remains unaffected by these interferences.

Sampling and offline testing are time-consuming and prone to errors. With its large-bore flow cell design, the DCM-20 can be installed directly in the main pipeline, providing continuous, real-time data without disrupting the production process. There is no need for bypass loops or additional sampling systems, just seamless in-line monitoring.

The DCM-20 remains highly stable over time, without requiring frequent recalibration or maintenance. Operators can rely on it to deliver precise concentration readings day in and day out, reducing downtime and operational costs.

Delays in measurement can lead to wasted product, inefficiencies, and costly troubleshooting. The DCM-20 provides real-time monitoring and data collection, allowing operators to detect anomalies immediately, optimize process conditions, and prevent potential issues before they escalate. This level of visibility translates into reduced waste, improved energy efficiency, and greater overall process control.

The KxS DCM-20 Process Refractometer provides both Ethernet and 4-20 mA output signals, allowing for seamless integration into automation systems for continuous process control. Unlike traditional offline lab measurements, which are costly and time-consuming, the DCM-20 delivers instant, traceable, and highly accurate concentration readings to ensure process stability and prevent production losses.