

Near Water Products and Hygienic Design

Measuring the Refractive Index in Near Water Production under Hygienic Conditions

Challenges:

- Ensuring food safety in minimally flavored water-based beverages
- Accurate inline monitoring of aroma and mineral concentrations in ppm
- Hygienic integration of sensors into CIP/SIP production environments
- High-frequency product changeovers with risk of cross-contamination

Applications:

- Refractometric control of aroma dosing in Near Water products
- Inline quality monitoring during beverage production and filling
- Real-time detection of concentration shifts at high resolution
- Implementation in hygienically demanding production environments

Method:

- Continuous, inline monitoring without sample preparation
- Temperature-compensated readings for stable and reproducible results

Near Water products - low-calorie, lightly flavored beverages - are among the fastest-growing segments in the beverage industry.

Their minimal concentrations of sugars, sweeteners, minerals, or flavorings pose specific challenges for production, especially in terms of accurate dosing and precise monitoring.

Maintaining consistent product quality and ensuring safe manufacturing requires both precise analytical monitoring and strict adherence to hygienic design principles.

Hygienic Design is a fundamental requirement in:

- Bottling and dosing systems for flavored water
- CIP- and SIP-capable production lines
- Automated flavor blending and mineralization processes

In Near Water beverage production, even slight variations in flavor concentration can affect taste and consumer acceptance.

As these beverages are mainly composed of water, the matrix is nearly neutral, making sensory evaluation difficult and placing greater importance on inline analytical measurements.

Process refractometers offer an effective solution by measuring the refractive index (RI) to determine concentration changes in real time.

Application Note

Food & Beverage Industry



Solution from SCHMIDT + HAENSCH

With the SCHMIDT + HAENSCH iPR FS and iPR HR² inline process refractometers, the concentration of ingredients in Near Water products can be measured directly and with exceptional precision - even at minimal dosing levels. These refractometers are specifically engineered for hygienic environments and provide real-time insights into the refractive index of the product stream, enabling continuous monitoring of flavor, mineral, or sweetener concentrations. These refractometers simplify the task of ensuring consistent dosing of delicate aromas, even in the ppm range. In hygienic beverage production, where taste, safety, and efficiency must go hand in hand, the process refractometers offer a robust, hygienically certified solution.



iPR HR²

Inline Process Refractometer

Product type	Product
Inline Process Refractometer	iPR FS

Inline Process Refractometer iPR HR²

Recommended accessories

- Calibrating standards (e.g. silicon oil)
- Suitable inline Housing (e.g. VariVent)

Advantages

- EHEDG-certified hygienic design
- Inline detection of flavor or mineral concentrations
- No delays from lab analysis
- Optimized for Near Water and flavored beverage production
- Suitable for automated, CIP/SIP-compatible installations
- Robust against cleaning agents, pressure, and temperature fluctuations
- Integrated temperature compensation

Typical industries

- Beverage production (Near Water, flavored waters, functional drinks)
- Dairy and juice processing
- Water treatment and mineralization
- High-precision ingredient dosing systems