

# Refractometric concentration measurement is providing a robust and cost-effective alternative to the potential risks of radiometry

The online concentration analysis of liquid media is one of the most crucial considerations for accurate process and quality control within the harsh realities of the chemical industrial environment.

Monitoring, recording, and controlling the concentration of dissolved solids in production lines, the process refractometer measures the refractive index continuously and in real time, accurately establishing the concentration, mass ratio, density, or dissolved solids contents of binary or quasi-binary liquids.

Users in industries such as chemical, textile, automotive and semiconductor are switching from radiometric measurement to refractometric technology for a more reliable, less hazardous and continuous solution for which no regular tests are required by law. Measurement is rapid and quantitation is extremely accurate.

FLEXIM worked with a major German chemical manufacturer looking for a suitably reliable and stable, long term alternative to the risks, high cost and administrative and organisational requirements of radiometric density and concentration meters for the continuous concentration measurement of highly corrosive hydrochloric acid. As well as the demands of regular documented maintenance, these meters are also expensive to dispose of at the end of their life cycle.

Producing chlorinated aromatics, amongst other things at its Höchst site, the chemical manufacturer's so-called side-chain plant specialises in the chlorination of the side chain of aromatic compounds, which is carried out by UV catalysts.



**Compliance with the specified concentration must be ensured at all times.**

Chlorination and hydrolysis both produce hydrogen chloride gas. Pure high-quality hydrochloric acid is produced by precipitation with water, following the burning at very high temperatures of the organic exhaust gas components. This is why it is essential to continuously measure this concentration,

ensuring that it is at 30% when fed into the industrial park's integrated network.

**Measurement of refraction is a well-established laboratory method for defining density and concentration.**

For hydrochloric acid there is an almost direct correlation between concentration and refractive index. Refractometers like those used by FLEXIM, combine the high accuracy of refraction measurement with unerring process reliability. Measuring using a patented transmitted-light method, the sensor head directly measures the refraction of light, unlike laboratory refractometers that measure indirectly via the critical angle of total reflection.

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