

Self-Sufficient CO₂ Production in Brewing Process

Fermentation CO₂ can be stored and used in carbonation for self-sufficiency. The required quality was obtained through in-line control with the O₂ sensor InPro 6950 i G. As a result a considerable cost saving was achieved.

To buy or to produce requested CO₂

Breweries, soft drink producers and other segments of the Food and Beverage industry use carbon dioxide (CO₂) in their production process. But in the brewing industry CO₂ is a by-product of the brewing fermentation process that is used to protect and ensure the quality and uniformity of beer. CO₂ is used to displace air from tanks, cans, bottles, and kegs before they are filled with beer.

In many cases, CO₂ is also incorporated directly into the product. In these applications either recovered or purchased commercial CO₂ is used.

Self-sufficient CO₂ production

In many breweries there is a desire to become or remain self-sufficient in their CO₂ production for use in their processes. To be self-sufficient a brewery must be able to produce enough CO₂ and have the storage capabilities to meet the demands throughout the entire production process. They must also balance the cost of purchasing CO₂ with the cost of the col-



lection system and the operating costs associated with purifying, storing, and distributing recovered CO₂.

Standards of purity in the beverage industry

In the case of both purchased or recovered CO₂ the quality of the products needs to be monitored for impurities. CO₂ used in this application has a purity of 99.98% and higher. The International Society of Beverage Technologists (ISBT) has suggested standards upon which impurities in CO₂ must be analyzed for public safety. Trace detection of ppm levels of O₂, THC, H₂O₂ and total sulfides in CO₂ used in the production processes need to be monitored. Incidents of benzene impurities in Perrier water as well as H₂S concern for Coke in Europe have heightened awareness and need for this quality control measurement.

Purity requirements in brewing industry

In breweries the monitoring of the ppm level of O₂ in the CO₂ is a typical application. O₂ present in the CO₂ will dissolve into the process in the liquid phase and cause oxidation of the beer effecting flavor, color and shelf life. Purity standards for CO₂ are typically less than 30 ppm for O₂. O₂-gas measurement systems are used throughout the collection and recovery system to monitor the different O₂ levels. Using an O₂-gas measurement system at the collector head of the fermentation tanks to trigger whether to vent or collect can result in longer collection times and less wasted vented CO₂, which is also an environmental concern. Monitoring CO₂ after the vaporizers of the recovery plant ensures the CO₂ being sent to the brewing or packaging meets the purity requirements.



InPro 6950 i G

METTLER TOLEDO solution

METTLER TOLEDO's newest sub ppb sensor InPro 6950 i G for O₂ detection together with the M400 multi-parameter transmitter and its advanced diagnostics is specifically designed for this application. The lower detection limits of the sensor will accurately measure the levels of oxygen in the CO₂ without the extensive process conditioning required of other monitoring systems available. The rugged design of the sensor will also withstand the pressure fluctuations seen on the collection system reducing downtime and maintenance.

InPro 6950 i G – the best choice for O₂ control in gas phase applications.

INGOLD's extensive experience in offering high quality gas measuring solutions for brewery applications has been implemented in the InPro 6950 i G sensor.

Benefits which can be achieved

- Cost saving
- No commercial CO₂ derived from ammonia synthesis or hydrogen generation or from wells
- Direct sensor installation without gas sampling and conditioning systems gives real in-line measurements

Features and benefits

- Easy-to-replace membrane body reduces service time
- Durable and rugged sensor design for increased resistance to harsh environments
- FDA compliant materials of construction and easy-to-clean high-polished surface finish (Ra ≤ 4 μm / 16 μin) to satisfy stringent regulatory requirements
- Suitable for hygienic applications: EHEDG certified

For more information:

▶ www.mt.com/o2-gas