



APPLICATION NOTE

SYNGAS

H₂ Monitoring in High CO Syngas

REAL TIME HYDROGEN MONITORING IN SYNGAS

Measuring hydrogen with H2scan inline analyzers in syngas streams helps:

- Provide valuable real time information
- Eliminate errors from slow or indirect analyzers
- Maintain the critical H₂/CO ratio
- Ensure process optimization

Synthesis gas, also known as syngas, is composed mainly of carbon monoxide and hydrogen, with carbon dioxide sometimes also present. There are various methods of producing syngas, such as gasification from different feedstocks (coal, natural gas, or biomass/waste products), partial oxidation, steam methane reforming, or autothermal reforming. The use of syngas is growing rapidly throughout the world, particularly where gasification can be used to produce high value products from low value feedstocks. There is also increasing emphasis on reducing emissions by converting flare, waste gas, and associated gas to valuable products such as methanol or energy.

Monitoring the H₂/CO ratio in syngas is critical to meet the needs of any downstream processes. For typical applications such as the production of methanol, liquid fuels using the Fischer-Tropsch process, or gas-to-liquids, the H₂/CO ratio must be maintained at 2:1.

Historically, this has been monitored either using a thermal conductivity device to measure hydrogen or by measuring the other gases present in order to indirectly derive the hydrogen measurement. This can result in costly inefficiencies in the process if the reaction is not taking place correctly.

Similarly, the delayed response time, complexity and maintenance requirements, and cost (both upfront and ongoing) make the gas chromatograph an unappealing option.

Using an H2scan inline process monitor combines the value and measurement speed of a TCD with the accuracy of a GC. By removing the uncertainty associated the hydrogen measurement and having this information available in real time, the syngas process can be tightly controlled to ensure process optimization.



H2scan's **HY-OPTIMA™ 2745** hydrogen specific analyzers measure hydrogen in syngas streams. The H2scan solid state, non-consumable sensor technology provides real-time continuous hydrogen concentration data with no cross-sensitivity to any other gases in the stream, including CO. No reference or carrier gas systems are required to reliably and accurately report real-time hydrogen measurements with fast response times. For more info please visit www.h2scan.com.