



WILL YOUR PRESSURE SENSOR FAIL AFTER SOME TIME OF BEING EXPOSED TO HYDROGEN?

BACKGROUND

Labom decided to use a scientific approach and enlisted leading experts Dr. Schweder and Dr. Köster to assess hydrogen measurement applications. They developed a calculation method to predict service life for sensors; the time during which a transmitter would work within spec.



CHALLENGE

Most pressure sensors are built using martensitic stainless steel as its resilient properties make it a suitable option for many applications. When the same material is used in hydrogen however, it can become brittle so it has a short life. A different option which can be employed is for pressure sensors with diaphragm seals and austenitic stainless steel diaphragms. However, another problem can arise; the small hydrogen molecules can penetrate through the stainless steel diaphragm and dissolve into the filling oil, causing an off-set in the sensor's zero point.

SOLUTION

When assessing the issue of pressure sensors working after being subjected to hydrogen, a scientific calculation can be employed. Input for the calculations are the process conditions. Based on your input on the pressure, temperature and percentage of hydrogen in your process, Labom's technical experts can calculate the service life for different sensor configurations.

Temperature is crucial as it impacts the sensor performance. Dr. Schweder and Dr. Köster model explain that in their model they use an Arrhenius approach to incorporate these effects in their calculations. From all these calculation results the total service life of a specific configuration is calculated.

RESULT

It was decided that to achieve the best and most neutral, science based motivation for a decision in this matter, Dr. Schweder and Dr. Köster decided it was time for a scientific approach.

Using the calculation tool for hydrogen applications Labom can now compare performance for both gold plated and stainless steel configurations.

Depending on the process conditions and requirements in your process, the best and most cost effective solution can be calculated for the customer and the use of the pressure sensor and its unique environment.

Find out more about Hydrogen solutions for your process at

