ABB 2600T pressure transmitters resist hydrogen permeation at Canadian refinery

ABB better alternative to gold plating at a lower cost.

**Measurement made easy**

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**Project description**

An ABB Model 266 pressure transmitter with remote seals has successfully resisted hydrogen permeation at our customer's premises. The ABB transmitter with a H-Shield coated diaphragm replaced a prematurely failing competitive transmitter with gold-plated diaphragms. The ABB transmitter has been operating since 2016 without failure.

The company is an Eastern Canada leader in industrial and commercial sales of petroleum products. Its Refinery is one of North America’s top-performing refineries.

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**The plant**

The plant processes North American and overseas crude oil received via ship, rail and pipeline. The refinery has significant storage capacity for crude oil and intermediate and refined products. The plant can also accommodate liquefied petroleum gas in its pressurized storage vessels or tanks. Its capacity is 235000 barrels per day.

ABB’s channel partner, responded to customer’s request for a permanent and reliable solution to the failing transmitters. They installed the ABB H-Shield 266 DP transmitter with remote seals.
H-Shield coating

During the manufacturing process for coating the ABB diaphragms with H-Shield, a direct current arc vaporizes titanium and silicon nitrides onto the 316L stainless steel surface. An electromagnetic field controls the vapor deposition. The result is a superhard, nanostructured, thin-film coating with specific anti-abrasion physical characteristics, that meets the needs of many tough process applications involving fluids which operate at extreme temperature and are highly corrosive, dirty, viscous or laden with solids that can block, foul or solidify the impulse lines or the transmitter body.

ABB coats the pressure sensor’s 316 stainless steel diaphragm to a thickness ranging from 3 to 5 μm. The coating has a hardness like diamond. But the deposition technology permits a springrate value that ensures good diaphragm flexing for process temperatures ranging from -100°C to 600°C.

ABB’s goal in the development of H-Shield was to find a thin film that:
- withstood permeability to hydrogen ions
- remained stable at higher temperatures
- retained diaphragm flexibility
- was harder
- had a lower coefficient of friction

University laboratory studies have demonstrated that the components of H-Shield films work as excellent barriers to hydrogen permeation, even at high temperatures. This alternative ABB solution offers better results than gold plating at a lower cost.

Additional ABB opportunities

The success of this hydrogen application has given ABB a great deal of credibility at customer’s. ABB is now their standard choice for all hydrogen applications and all Foundation Fieldbus transmitters.

Additionally, success of ABB’s Model 266 pressure transmitters has sparked customer’s interest in other ABB instrument purchases. In 2018 ABB was invited to bid Model 266 differential pressure and TTF300 temperature transmitters. Again, ABB won the bid against three major competitors.

Early in 2019 this customer purchased an LLT100 laser level transmitter for installation on a butane sphere. The company confirms that it is working well since the start up and are planning to purchase more.

On the analytical side, ABB has sold 13 AO2000 oxygen and carbon monoxide analyzers for emission monitoring, which have been working flawlessly.

For more information, contact:

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