

HotSense™ for measurements through TSA

for applications in Oil & Gas, Energy and Process control

HotSense™ ultrasonic sensors are the only fully intrinsically safe ultrasonic sensors which can be used to make **thickness measurements through thermally sprayed aluminium (TSA) coatings** at high or low temperatures.

Keywords: wall thickness, thermally sprayed aluminium (TSA), oil & gas, corrosion, coatings

Key Features:

- ▶ HotSense™ sensors can make thickness measurements through TSA without coating removal or damage.
- ▶ Protective coatings are preserved and un-damaged
- ▶ Coated assets can be monitored in-service without the need for shut down, plant access or isolation.
- ▶ -55°C/-67°F to +380°C/715°F (+550°C/1020°F on request) wide operating temperature range for in-service monitoring
- ▶ Sensors can be deployed while plant is in operation – no welding
- ▶ A truly high temperature sensor powered by the Ionix HPZ piezoceramic



Key benefits:

- ▶ Increase safety with in-service monitoring of coated pipes
- ▶ In-service installation with no need for welding maximises plant availability
- ▶ Deployable across oil & gas and other hazardous industries with ATEX Zone 0 certification

1. Thermally Sprayed Aluminium (TSA) – Inspection Challenge

TSA offers a barrier coating to assets which can offer protection across a wide temperature range.

- TSA removes the presence of aqueous solutions from the asset surface, preventing the formation of atmospheric corrosion or CUI. It also provides a large area sacrificial anode, particularly well-suited to marine environments, which prevents galvanic corrosion from more cathodic metals such as carbon and stainless steels.
- TSA presents a challenge for conventional ultrasonic thickness measurements as its rough surface can prevent coupling of ultrasonic signals and internal pores and features may scatter any transmitted energy.
- Pipes or structures which are TSA coated are a challenge for manual thickness measurements and cannot be monitored using standard fixed ultrasonic monitoring technologies.

2. HotSense™ Solution

- HotSense™ sensors deployed directly onto TSA using the HotSense™ deployment clamp and solid metal couplant.
- Measurements can be made through TSA standard coating thicknesses of 0.2 – 1.2mm without coating removal or modification.
- Clamp coupling maintains TSA integrity.
- Clamp solutions allows sensors to be repositioned as required.
- Stable thickness measurements can be made across the temperature range of -55°C/-67°F to +380°C/715°F (+550°C/1020°F on request) using the complete HotSense™ Monitoring Solution.
- Plot below shows the data out put and measurements made through TSA when connecting the sensors to an automated UT thickness gauge platform.

