Interested in ultrasonic thickness monitoring? Here's a quick overview to show which HotSense™ sensor is right for your application.

At Ionix, we have developed permanently installed thickness monitoring sensors and deployment systems to cover the widest possible range of installation requirements and asset types. Whilst we specialize in sensors for extreme temperatures, the goal of our site-ready sensor range is to have a solution for any customer's requirements, no matter how large or small. But how to know which sensor, ultrasonic couplant, or installation method to use for your application? This blog will show you how to select the right sensor to meet your monitoring needs.

Sensor Overview: HotSense™ monitoring product range

HotSense DE	HotSense 380	HotSense 550
		
-55 to + 150 °C	- 197 to + 380 °C	- 55 to + 550 °C

Ionix offer 3 main ultrasonic sensors for wall thickness monitoring applications, each suitable for a different range of operating temperatures. All sensors are compatible with fully integrated wireless systems such as the CALIPERAY, as well as low-cost manual data collection methods using your thickness gauges and flaw detectors. As site safety and ease of integration into our customer's systems is paramount, all these thickness monitoring sensors are certified intrinsically safe under ATEX and IECEx for use in zone 0 hazardous environments and FM Class 1 Div 1 when used with the CALIPERAY automated monitoring system. Additionally,

1. HotSense DE

HotSense DE is our lower temperature, lowest cost sensor which cuts no corners on flexibility. Dual element ultrasonics allows accurate time-of-flight measurement through anti-corrosion coatings commonly used at lower temperatures, and an in-built magnet attaches and aligns the sensor to simplify installation.

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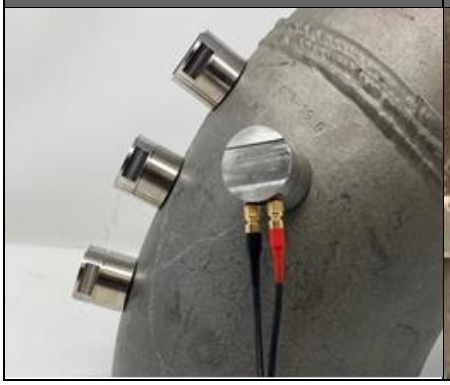
"Looking for a low cost or low temperature sensor, or measuring a coated pipe? Are you looking for a semi-permanent process monitoring solution, or improving inspection grid array measurements by introducing fixed point sensors on areas of concern? HotSense DE is the one for you "

An epoxy can be used for coupling and fixation, which provides both a strong permanent bond of the sensor to the asset being measured and serves as a highly effective ultrasonic couplant. This arrangement allows the sensor to be quickly installed on pipes and vessels of virtually any size, whilst also allowing multiple sensors to be tightly grouped together (for instance, providing fixed point measurements on the areas of concern in an inspection grid), or spaced circumferentially around a pipe.

In response to requirements from customers for a truly removable and moveable solution for shorter-term wall thickness monitoring during process changes, Ionix have introduced a 'dry' polymer pad couplant which, when secured by a mechanical strap, provides stable coupling that can be removed and re-used without any residue.

Magnet with epoxy couplant	Polymer pad couplant
	

2. HotSense 380

HotSense 380 is the industry leading extreme environment monitoring sensor, featuring an integrated 25mm stainless steel delay line, and installed with a rugged metal strap deployment system that can stand the test of time in any application environment. Intrinsically safe, nuclear certified and capable of a wide operating temperature from cryogenic to high temperature. HotSense 380 remains the only high temperature monitoring sensor which can be fully insulated and encased with weatherproofing, reducing the risks of corrosion under insulation (CUI).

Suitable for use on uncoated pipes from 2" to 28" using straps, or on vessels using studs, this sensor uses a solid metal foil to ultrasonically couple to your asset, offering unparalleled measurement stability and longevity. All deployment systems are designed with the installer in mind; a simple installation procedure with one tool, to decrease time on site and allow safe installation whilst the assets are at their operating process temperature.

"Looking for an ultra-rugged, ultra-versatile solution for thickness monitoring? In need of a fixed-point monitoring sensor for assets with high process temperatures? HotSense 380 and its all-mechanical installation solutions may be your best fit. "

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How to know that this sensor can be installed on your asset?

- Standard mechanical strap-based deployment systems are available from pipes of size NPS 2 to NPS 16, with custom solutions up to NPS 28, and suitable for both straight and elbow sections of pipe.
- For larger pipes and vessels, the most common solution is stud welding; with a wide range of weld techniques available, this becomes very cost-effective with large scale deployments on large assets.

3. HotSense 550

A specialist sensor for the highest temperature applications, the HotSense 550 features an integrated 75mm delay line, allowing for greater range in thicknesses to be monitored such as in power generation and nuclear. The best bit? HotSense UHT is fully compatible with all the HotSense 380 deployment systems, guaranteeing a simple site installation.

Do you require thickness monitoring for an asset of process temperature above 380 °C? Are you looking for a deployment solution which can be installed without requiring a shutdown, and which will be stable for years in the harshest environments? HotSense UHT is the sensor for you.

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4. Summary

Sensor	Temperature Range	Coupling	Intrinsically safe?	Installation
HotSense DE	-55 to +150 °C -67 to 302 °F	Polymer pad / Epoxy	Zone 0	≥2"
HotSense 380	-197 to +380 °C -322 to 716 °F	Solid metal couplant	Zone 0	2" to 36" with straps >36" welded
HotSense 550	-55 to +550 °C -67 to 1,022 °F	Solid metal couplant	Zone 0	2" to 36" with straps >36" welded

For guidance or further information on any of our ultrasonic thickness monitoring sensors and systems, or to view our ever-growing range of extreme temperature NDT inspection products, please contact via email contact@ionix.at or our website www.ionixadvancedtechnologies.co.uk