



Wallpass



Using ultrasound to supply sensors and transmit data through metal walls

What is Wallpass?

Wallpass uses sound waves to power and probe all types of sensors (temperature, stress, strain, vibration, etc.) located in enclosed metal environments, such as pressure vessels. It can transmit signals with a strength of few watts through several centimeters thickness walls. Piezoelectric transducers convert this acoustic energy to electricity. The intelligent part of the system is located in its easily accessible emitter. The receiver electronics are as simple as possible, to keep the sensor's implementation costs low and ensure its sturdiness and reliability over time.

Wallpass was approved following industrial field trials to detect anomalies in clamped connections between metal tubes and to prevent pipeline leaks.

Applications

- Oil and gas/oil rig pipes: monitoring physical parameters inside pipes; detecting connection defects during assembly
- Corrosion measurements on ship and submarine hulls
- Monitoring metal tanks, including pressure vessels
- Chemical tank monitoring
- Vacuum monitoring in superconducting power cables

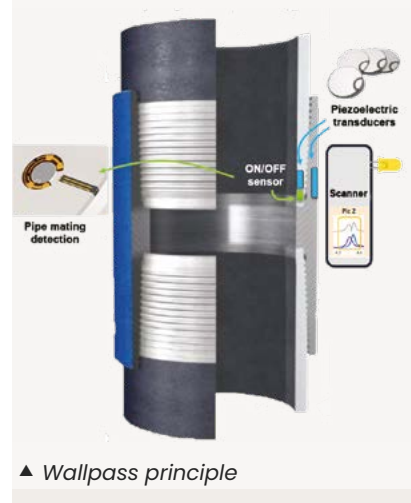
What's new?

- Although mainly used in non-destructive testing, ultrasound can also be harnessed to supply sensors and transmit data.
- Wallpass overcomes the limitations of inductive communication solutions (RFID, NFC, resonant inductive transfers), which cannot operate through metal surfaces due to eddy currents.
- The accessible part of the system is a combined emitter and scanner accommodating complex control electronics that define optimal wave frequencies and waveforms according to the type and thickness of metal.
- This scanner is a generic system, able to supply and read all sensors. Only the sensor 'tag' needs to be duplicated, dramatically lowering costs.
- The inaccessible sensor electronics have been simplified as much as possible.



Key fact

Technology protected by three patents covering the concept and control electronics



What's next?

- Wallpass was approved in 2022 in an operational environment for checking that pipes mate correctly in oil pipelines
- Research is underway to roll out the technology to other applications, including in the aviation and energy industries.
- This technology could be adapted for other industrial fields within 24 months.

Interested in this technology?

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