

# LNG storage tank multipoint temperature profiling

## Leak detection and cool-down monitoring



### LNG storage tanks

- Space saving solution for natural gas: LNG occupies 600 times less space than natural gas in its gaseous state.
- Auto-refrigeration systems require constant pressure and temperature monitoring
- Storage temperature: -165 °C to -160 °C (-265 °F to -260 °F) in a full containment tank

### Temperature measurement

Effective leak detection and cool-down temperature monitoring ensure safety in LNG storage operations. It helps reduce the environmental, safety and financial impacts of leaks and improve operational excellence.

iTHERM MultiSens TMS01 multipoint temperature assemblies:

- Flexible design
- Complete temperature profiles
- Minimally invasive
- Maintenance friendly with replaceable RTD inserts



### LNG storage tanks

Liquefied natural gas storage tanks are a critical part of the LNG storage and transfer value chain. The complex, highly engineered tank systems use auto-refrigeration to keep pressure and temperature constant, and the natural gas in its liquid state. LNG storage temperatures in full containment tanks typically range from -165 °C to -160 °C (-265 °F to -260 °F), also known as cryogenic conditions.

**Challenge** Safe and reliable LNG storage and transfer operations require accurate temperature monitoring to detect hazardous leaks and to prevent mechanical damage to pipes, pumps, valves or vessels during cool-downs.

### Leak detection

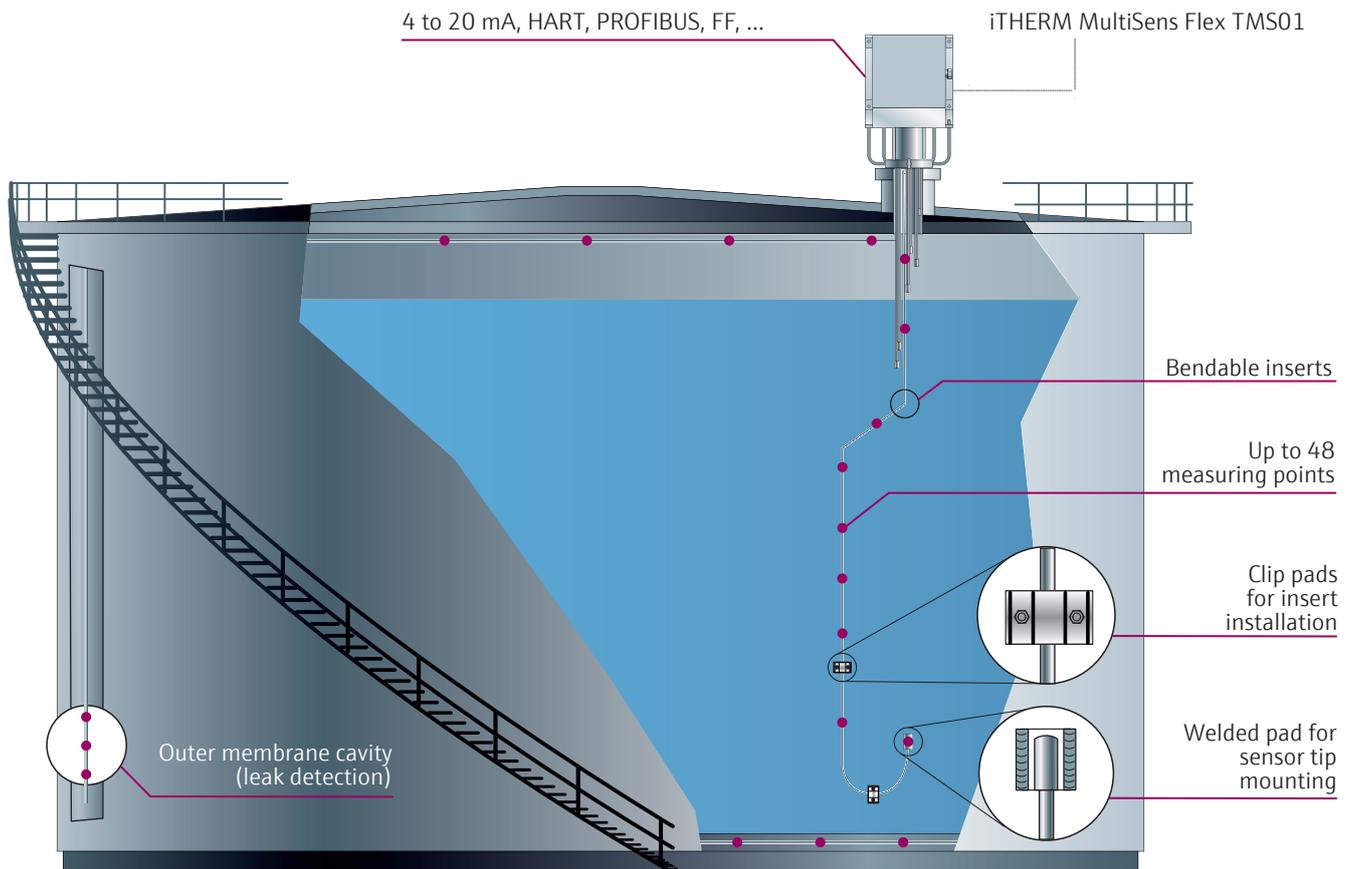
Product loss, health and safety risks, damaged infrastructure: Storing highly compressed hazardous media such as LNG requires reliable safety systems. Monitoring temperature profiles using multipoint RTD sensors in strategically positioned areas of the tanks helps locate and mitigate these risks. Atypical temperature variations in the outer

tank wall cavity for example alert operators of possible loss of containment, providing critical opportunity for timely maintenance or safety response.

### Cool-down temperature monitoring

Pre-cooling lines and tanks to cryogenic levels before loading helps to prevent vapor generation and thermal stress on the infrastructure. To ensure optimum process conditions, operators require reliable temperature data from the tank bottom, membrane walls and roof.

**Our solution** The iTHERM MultiSens Flex TMS01 multipoint assembly with flexible independent sensors offer accurate measurements at cryogenic temperatures. Engineered to meet the highest safety standards, the instruments can be customized to fit specific application requirements. Using a single process connection the bendable sensor probes accommodate any particular 3D layout to reach all parts of the tank, providing a complete temperature profile for leak detection and cool-down monitoring.



LNG storage tank illustration with TMS01 multipoint temperature assembly, mounting accessories

### Specifications

- Measuring range with recommended RTD sensors -200 to + 600 °C (-328 to 1,112 °F)
- Fast response times ( $t_{50} = 0.8$  s;  $t_{90} = 2$  s)
- Maximum pressure: 100 bar (1,450 psi)
- Individually replaceable sensors
- Up to 48 measurement points per assembly
- Flexible (3D bendable) or linear design
- Transmitters and system products

### Our service

From site inspection to installation and supervision, our service packages adapt to your needs:

- Engineering & consulting
- Tests & certifications
- Factory acceptance tests (also remote)
- Maintenance, calibration
- Installation & supervision



### Further resources

Temperature profiling brochure (CP00003T)

[www.adresses.endress.com](http://www.adresses.endress.com)