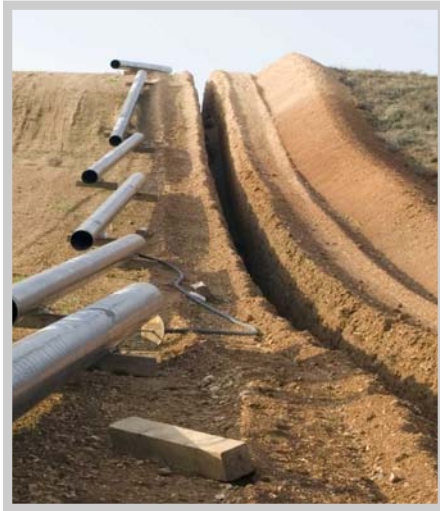


# Application Note

## For Pipelines



### Pipeline Leak Detection



SensorTran offers advanced fiber-optic based Distributed Temperature Sensing (DTS) solutions that provide a significant advancement in the integrity management (leak detection) of pipelines.

With the ability to quickly detect both the presence and location of small leak events, these solutions provide an affordable, proven, and reliable solution for both short and long transfer lines, as well as plant-wide pipeline distribution networks.

A key benefit of DTS-based pipeline integrity monitoring is that its performance is unaffected by operational changes such as changes in flow, valve operation, etc, which results in a reduced level of false alarms.

Small leaks along entire lengths of pipelines are detected and located by monitoring small and anomalous local temperature changes and can be readily applied to a wide range of pipeline applications. For gas lines, the escaping pressurized gas creates a local cold zone on the outer surface of the pipeline due to the Joule-Thomson cooling effect, the temperature change, and its location being detected and measured by the system. Cryogenic lines such as LNG, LPG, ammonia, ethylene, etc. also create cold zones which can be easily detected when leaks occur.

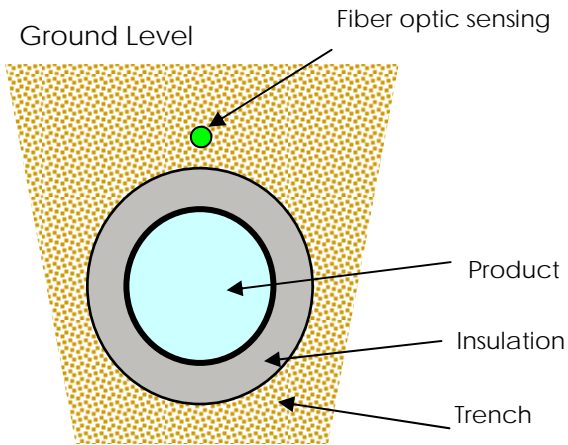
Lines carrying heated product such as heavy oil, multi-phase products, molten products, heated water, and steam also lend themselves to these integrity monitoring solutions, due to the local temperature increases which occur as the product escapes.

Better Decisions from Better Data
<ul style="list-style-type: none"><li>• provides accurate and dynamic information in real-time for up to 30,000 discrete points for complete monitoring</li></ul>
<ul style="list-style-type: none"><li>• provides positional data to allow for identification of leak locations with no prior knowledge of performance characteristics</li></ul>
<ul style="list-style-type: none"><li>• provides temperature data for monitoring pipeline structure effects and insulation integrity</li></ul>





## Optical Fiber Deployment

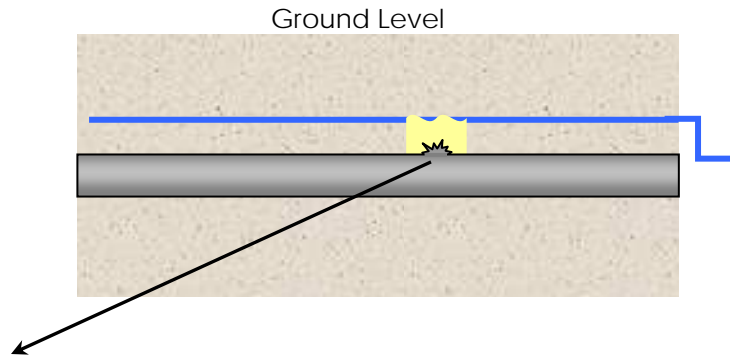
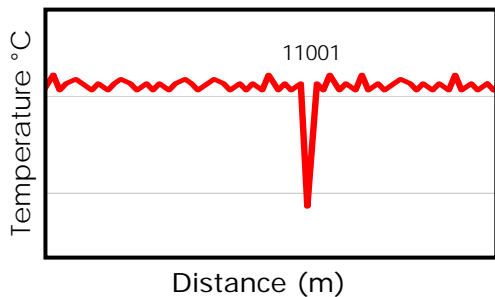


A wide range of robust optical fiber cables are available to suit specific project and installation requirements. Cables can be supplied and installed within an outer stainless steel tube or Steel Wire Armoured (SWA) cable construction to provide excellent mechanical, chemical, and moisture protection while ensuring good thermal conductance to the fibers. Fiber types are selected suitable for duty with coatings designed to meet temperature limits of  $-196^{\circ}\text{C}$  to  $+450^{\circ}\text{C}$ .

Numerous alternatives exist for the placement of the optical cables dependant upon the specific project requirements and application thermal time constraints. Installation methods are carefully selected to allow maximum flexibility while affording best mechanical protection.

Typical deployment techniques include pre-fabricated cable, spooling, or pulling the fiber inside a previously installed, dedicated conduit in close proximity to the pipe surface. Such deployment ensures true representation of pipeline heat distribution, independent of external influences.

## Leak Detection



**SENSORTRAN**

Optical Conclusions

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