



## Brine Pipeline Leakage Detection

### Solvay Chemicals, Germany

AP Sensing's Distributed Temperature Sensing (DTS) system is installed at Solvay Chemicals in Germany, to monitor the integrity of an important 8 km brine pipeline. Solvay Chemicals is an international operating chemical company. It employs about 14,800 people in 40 countries and belongs to one of the ten biggest chemical enterprises worldwide.

AP Sensing's Distributed Fiber Optic Sensor (DFOS)-based pipeline leakage detection system spots leakages as small as 0.5 liters / minute (0.007 %), in an installation operating at a very small temperature difference of 5 °C between liquid and ambient temperature.

The leakage detection system was designed, engineered and integrated by GESO GmbH Jena, an engineering and systems integration company with a strong focus on fiber optic sensing solutions.

AP Sensing's real time monitoring system detects temperature anomalies along the pipeline. Such anomalies can originate from the temperature difference between the liquid and the ambient temperature, or for high pressure pipelines, from physical effects (like Joule-Thomson, or evaporation). The optical temperature sensing method is ideal for detecting creeping leakages.

The method employed is **compliant with the German requirements** according to TRFL (Guidelines for transmission of hazardous liquids / Technische Regel für Fernleitungen). It has been accepted for temporary and permanent leakage monitoring.



*Installation Site*

The installation is located in the “Salt-Area” (Salzlandkreis) near Bernburg (between Berlin and Leipzig); the salt field is located 300 to 700 m below ground. High-pressure water is delivered into the deposit to unleash the salt. From there the brine is transported via an 8 km polyethylene high-density (PEHD) pipe to the plant. The overall investment for the brine pipeline was about € 2.7 M.

The 450 mm diameter pipeline is deployed about 1 m below the surface and the sensor cable is buried directly below the pipeline. Using the fiber optic-based DTS method ensures that the entire downstream process is monitored. Any leaking brine will warm up the ground around the sensor fiber deployed below the pipeline, and even at very low leakage rates the operator receives an alarm with a clear indication of leak position with a resolution down to 1 m.

AP Sensing’s DTS solution is ideal for the client’s use case. Our system provides continuous real-time information about the asset condition and ensures pipeline integrity, immediate leakage detection and risk mitigation. The fiber itself is completely passive, immune to electromagnetic interference (EMI) and non-intrusive. With being virtually maintenance-free, the customer’s valuable and potentially risky infrastructure is securely and efficiently monitored for maximum protection.



*Pipeline with sensor cable (black)*