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In oil and gas in industry it is very beneficial to accurately see the contents of tanks in real time for various reasons, including production maximization and minimization of down-time.

So far, the market has been lacking a non-nucleonic, environmentally safe solution that provides full profiles of vessels in real time.

# ROCSOLE - LITI TANK PROFILER

*LITI = Liquid In-tank Inspection*

DASTEC

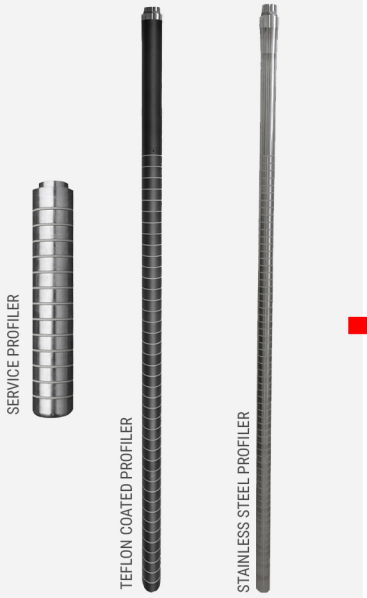
# LITI TANK PROFILER

Liquid In-tank Inspection

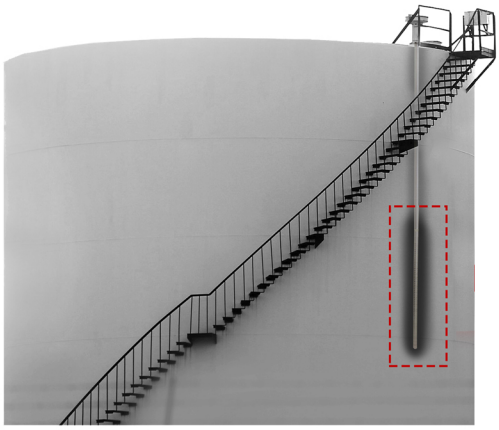
Easy installation

Results in: 1min

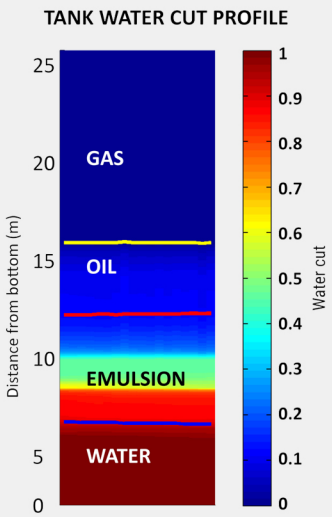
## PRODUCT




## TARGET



## RESULTS




## TECHNOLOGY

Rocsole's technology is based on a tomographic technology called Electrical Tomography (ET). The basic idea in ET image construction is to find a permittivity/conductivity distribution for which the observations predicted by the model are in good agreement with actual ET measurement data.

The general idea in tomographic measurements is to expose the target of interest to a physical stimulus, e.g. electromagnetic waves, radiation beam, acoustic waves or electrical signals, and measure the response caused by the target. From the response signals it is possible, with the aid of mathematical models, to infer the distribution of different material within the target.

Rocsole's technology is developed in a way that it doesn't get bogged down by contamination and it can effectively image separation despite the deposition or any other contamination.

## BENEFITS

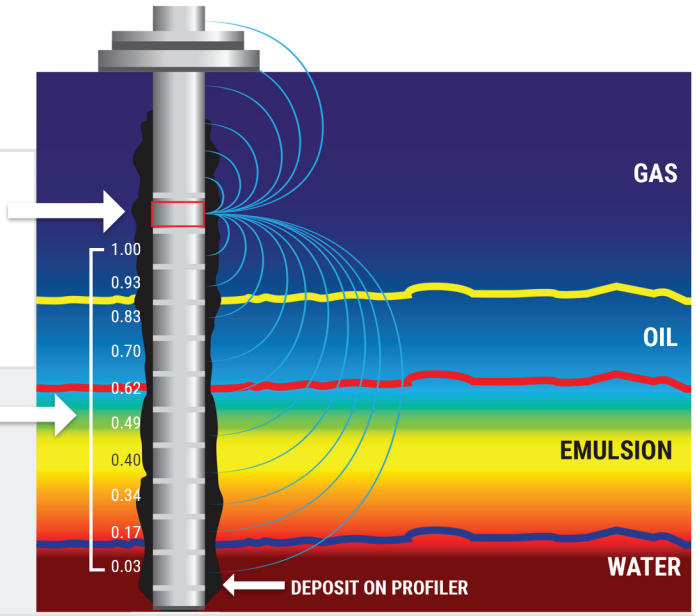
Rocsole's products are designed for demanding industrial conditions, but are also very easy to install and maintain with no moving parts. System is field calibration free and technology is certified for hazardous areas. All images and trends are available through web-based user interface.
The benefits of this patented technology include:

- **REAL TIME PROCESS OPTIMIZATION**
- **PREVENT UNPLANNED SHUTDOWNS**
- **IMPROVED PROCESS BY OPTIMIZING AN EMULSION LAYER**
- **INCREASE PRODUCTION TROUGHPUT**
- **NON NUCLEONIC**

# ROCSOLE'S SEE BEYOND PRINCIPLE

**1** LOW VOLTAGE INJECTION TO ONE ELECTRODE

**2** ELECTRIC FIELD PASSES DEPOSIT IT IS POSSIBLE TO MEASURE RESPONSE FROM ALL THE OTHER ELECTRODES

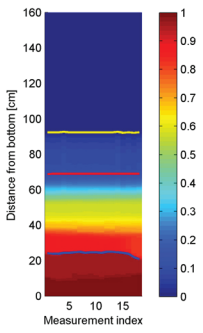



**3** TOMOGRAPHY DETERMINES MATERIAL DISTRIBUTION INSIDE THE SEPARATOR/TANK
*tomographic image represents conductivity or permittivity*

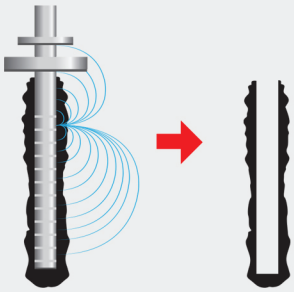
- **A** WE CAN SEPARATE DEPOSIT
- **B** WE CAN SEE THE EMULSION AND OTHER LAYERS

## FIELD RESULTS

### WATER CUT PROFILE




### DEPOSITION THICKNESS



## BENEFITS

- **OIL FIELD** LIFE CYCLE OPTIMIZATION
- **REAL TIME** PROCESS OPTIMIZATION
- **24/7 DATA** MONITORING
  ALL DATA TO DATABASE

*Actual speed of injections:*
**OVER 10 CYCLES PER SECOND**

**NON NUCLEONIC**
→ SAFE, IMPROVED HSE
→ REDUCED ADMIN

## WHY PROFILER WORKS EVEN WHEN IT IS CONTAMINATED?

- **ELECTRIC FIELD PASSES TROUGH DIFFERENT MATERIALS** *(wax, scale, bitumen etc..).*
- **ROCSOLE PROFILER CAN SEE BEYOND DEPOSITS.**

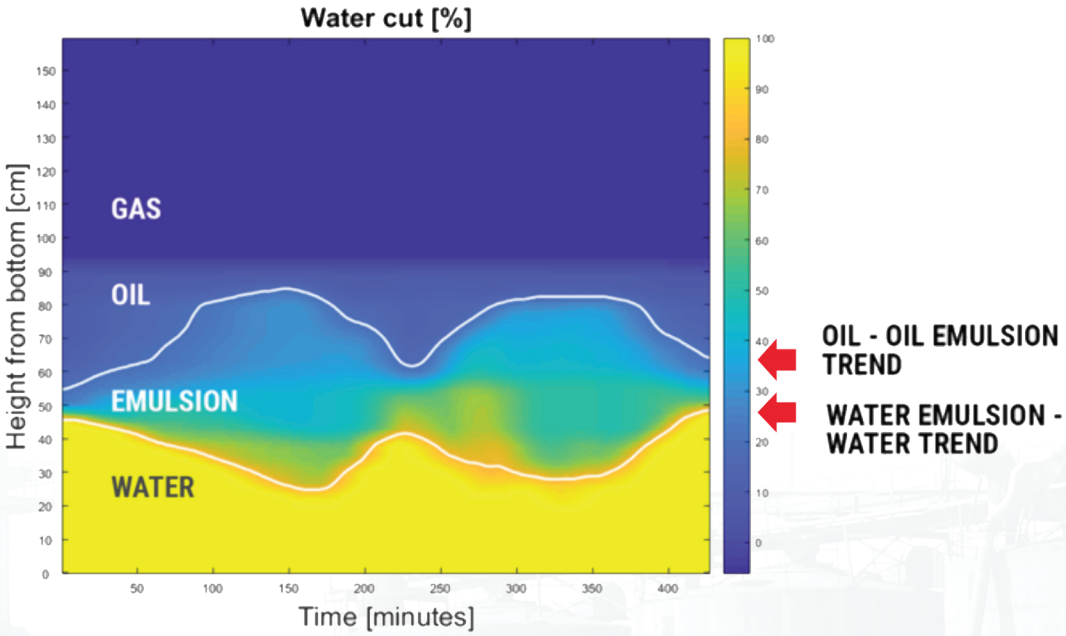
***DO YOU WANT TO SEE BEYOND?***

www.rocsole.com

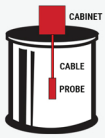
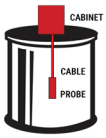
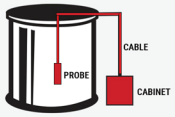
# LITI | FIELD RESULTS

Liquid In-tank Inspection

Improve a tank efficiency with full level profiling & emulsion monitoring.




There are multiple options for LITI - Tank Profiler:

| CABINET LOCATION | CABLE LENGTH<br>Between electronics (Cabinet) & mechanics (Probe) | CABINET TYPE | PROBE MEASUREMENT LENGHT | TYPE OF INSTALLATION |
|---|---|---|---|---|
|  <br>Electronics on tank roof | **25** m |  **S** SIZE CABINET | **360** mm | **TEMPORARY**<br>For Scanning service |
|  <br>Electronics on tank roof | **25** m |  **L** SIZE CABINET | **2880** mm | **PERMANENT** |
|  <br>Electronics on ground level | **25-90** m |  **P** POWER FEED CABINET | **2880** mm | **PERMANENT** |

# LITI | CASE STUDY

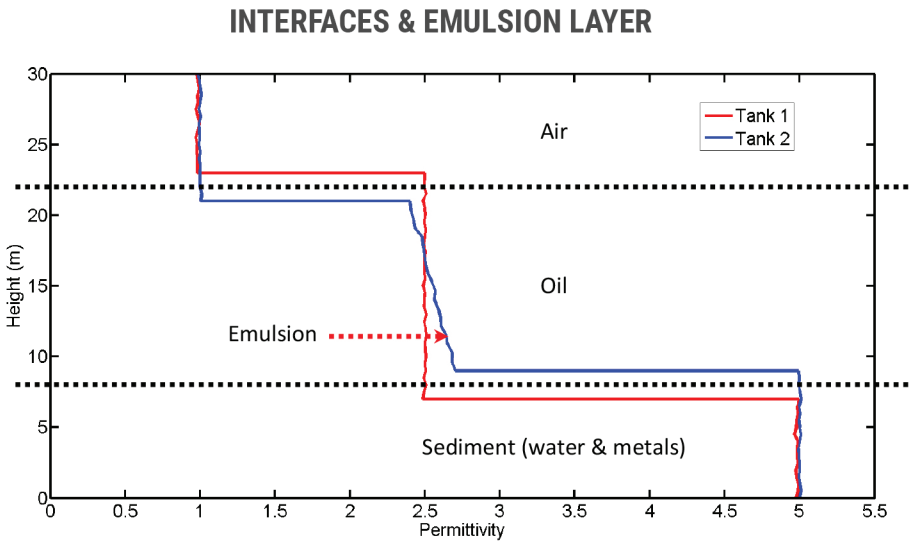
Liquid In-tank Inspection

The aim was perform two scanning rounds to two 5000 m3 oil storage tanks in an oil refinery.

## SAMPLES

The tanks were known to contain layers of air, oil, a mud like water/metal sediment on the bottom.

## RESULTS




**TANK 1**:
The trend change is sharp, because there is a clean interface.

**TANK 2**:
The trend change becomes more gradual as the emulsion electrical properties create a transition between that of oil and water.

## CONLUSIONS

Location of the interfaces and thickness of the emulsion layer were easily & accurately detected.

The permittivity varies as a function of tank height and it is possible to separate the composition of the oil + sludge to reduce cleaning costs.

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# SEE BEYOND.

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