

# Temperature measurement with non-invasive technology

## Sulfuric acid temperature measurement with TSP341-N



The non-invasive temperature sensor NINVA TSP341-N was successfully tested in a sulfuric acid plant in the metallurgical sector in Mexico.

Measurement made easy

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01 NINVA TSP341-N  
non-invasive  
temperature Sensor  
installed on MONDI  
pipe.

### Introduction

Temperature measurement is very important in the production of sulfuric acid ( $H_2SO_4$ ), as it tends to be corrosive at high temperatures associated with concentration. Therefore, it is very important to control the temperature within suitable ranges to avoid damage to the absorption towers.

### Challenge

It was required to measure temperature in different process pipelines for the two sulfuric acid ( $H_2SO_4$ ) plants with a low concentration of 10% and a high concentration of 96-98%. The customer currently has Alloy 20 thermowells with RTD and remote transmitter installed at different points. Due to corrosion and stress by vibration, they need to replace every 6 month several thermowells to avoid dangerous leaks and emergency shutdowns.

02 Measuring curves, red color TSP341-N, blue color RTD with thermowell.

03 Snapshot of DCS measurements with nominal operating temperature at 77°C. the difference between NINVA and the thermowell was 0.59°C

### ABB Solution

A NINVA TSP341-N was installed on a MONDI pipe, which is made of a special metal alloy to resist chemical attack. Since this pipe has a rough outer wall, the contact surfaces were polished as smooth as possible before installing the new non-invasive sensor.

Thanks to the clamp-on mounting of the NINVA, it was not necessary to drill a hole in the pipe; the sensor was simply clamped onto the pipe at the location of the required temperature measurement.



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### Conclusion

The measurement values obtained between the existing transmitter and the TSP341-N were very similar, with a difference of approximately 0.59 °C, at a nominal temperature of 77°C. the dynamic response was also similar to the thermowell.

The customer is very satisfied with the test results and purchased 4 devices, the potential is close to 30 measurement points, purchases will be made in batches of 2 to 4 devices until the 30 points are covered.

One of the main benefits of using ABB's non-invasive technology is the safety and integrity of personnel replacing damaged thermowells, since it avoids exposing them to risks such as burns due to contact with H2SO4.

Another important benefit is the reduction of operating costs, as it is not necessary to change the Alloy 20 thermowells at critical points every year as a preventive action. Additional the process does not need to be stopped to install the sensor as the pipeline is not drilled into.