

# Iplom enhances catalyst life, process safety and efficiency

## Temperature profile monitoring of the catalyst bed

# IPLOM

Iplom SpA is an Italian oil refining company located near the Metropolitan City of Genoa. With a maximum production capacity of 1.89 million tons per year, Iplom produces bitumen, diesel oil for automotive and fuel oil with a very low sulfur content.

“Thanks to reliable temperature measurements we are now able to guarantee the safety in the catalytic reaction process for the entire life cycle of the catalyst (24 months or more). The device’s diagnostic chamber enables us to promptly detect any anomalies and better plan future interventions. The solution from Endress+Hauser is a true gain in terms of safety and yield.”

Stefano Galli  
Instrumentation and analysis  
Iplom SpA



Solutions for the oil & gas industry | Iplom SpA refinery in Busalla, Italy

**Iplom SpA sought to optimize its refining process, to extend its catalyst life and to increase safety in a hydrodesulfurization (HDS) application through precise 3D temperature profiling.**

**Summary** Given the inevitable price volatility of its product, Iplom searched for ways to increase both process efficiency and product quality to strengthen its position within the highly competitive oil & gas market. A focus on plant safety was, as always, a given.

Endress+Hauser provided a tailor-made temperature profile measurement solution consisting of an iTHERM MultiSens Flex TMS02 multipoint assembly as well as expert guidance from configuration to installation, bringing the project to completion in time and on budget. This solution has led to considerable improvements by optimizing process performance, extending catalyst life and increasing plant safety.

**Challenge** To ensure safe and efficient chemical reaction control, operators depend on critical insights and data from the process as well as state-of-the-art instruments that provide additional safety barriers against extreme process conditions. An uneven temperature distribution (hotspots) led to the fact that the catalyst degraded faster than necessary and the process was not running at its peak capacity. Iplom thus set the following targets:

- Optimize process monitoring and control, reduce hotspots
- Gain meaningful data for future improvements
- Increase catalyst life
- Increase product quality
- Further increase plant safety

**Solution** Our MultiSens Flex multipoint thermometer offered a robust, single-nozzle, multi-sensor solution by monitoring the temperature profile of the catalyst bed in a 3D layout. The device’s on-board diagnostic chamber adds a vital process containment layer.



Endress+Hauser iTHERM MultiSens Flex TMS02 with built-in diagnostic chamber

**Application details** The harsh process conditions of approximately 75 bar and 430 °C under which the HDS reactor is operating, as well as the presence of corrosive chemicals such as sulfur and hydrogen, called for a robust and long-lasting solution. The multipoint assembly was installed on the level 4 catalyst bed of the diesel oil reactor to monitor the temperature at two different heights. It now enables Iplom to establish a precise

temperature profile, to maximize process efficiency and to yield a high quality product according to strict industry specifications.

#### Solution components

The multipoint thermometer chosen was a standardized iTHERM MultiSens Flex TMS02 in a configuration carrying 20 measuring points, 12 of which are innovative TS901 ProfileSens inserts currently being developed

and field-tested. The remaining eight single-point thermocouples are used in parallel as reference. The built-in diagnostic chamber provides valuable data for monitoring the condition of the multipoint assembly itself as well as to detect and contain potential process leakage. The device is fitted with a Cerabar PMP71 digital pressure transmitter and iTEMP TMT182 temperature transmitters communicating via 4 to 20 mA HART protocol with Iplom's DCS system.

Due to the time-critical nature of the plant's shutdown period, the reactor needed to be fully operational without delay. In addition to delivering the hardware, Endress+Hauser performed a series of services that helped streamline the entire replacement process from quotation to installation:

- Project management
- Detailed instrument engineering
- 3D routing calculations and installation layout engineering
- Factory acceptance test
- Installation supervision

Our experienced technicians guided the process all the way to completion in time and on budget.

**Results** Iplom tested the MultiSens Flex TMS02 with the new ProfileSens cable sensors in substitution of a traditional system and are very pleased with the devices' performance as well as the services provided.

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