

# Successful reactor revamp at Preem refinery

## Efficient HDS, HC temperature control with multipoint solutions



Preem is the largest fuel company in Sweden, with a refining capacity of more than 18 million m<sup>3</sup> of crude oil every year between its two refineries in Gothenburg and Lysekil.

The company refines and sells gasoline, diesel, heating oil and renewable fuels to companies and consumers in Sweden and abroad.



iTHERM MultiSens



Preem refinery in Lysekil

**From standard temperature control to customized, engineered temperature solutions: iTHERM MultiSens multipoint assemblies optimize temperature control and process efficiency.**

### The results

- Longlasting solution that endures two turnaround cycles (about 12 years)
- Precise temperature profiling for accurate process temperature control
- Single, pre-existing nozzle as reactor entry point, without compromising catalyst discharge
- Higher reliability with independent sensors
- Increased safety: Leakage prevention, detection and management

**Customer challenge** Setting out to leading the transition towards a sustainable society, Preem is one of the most modern, energy-efficient and environmentally friendly refinery in Europe. Its hydrocracking and hydrodesulfurization reactors in the

Lysekil plant were due for a new temperature measurement solution to increase accuracy and fine-tune process control. Preem expected the new instruments and their installation to comply with the following requirements:

- High reliability of the temperature probes
- Leakage prevention and detection
- Entry through reactor drain nozzle
- Tight turnaround timeframe of only five days

**Solution** Endress+Hauser delivered a custom-engineered solution tailored to Preem's specifications, which included:

- Two iTHERM MultiSens TMS02 multipoints for its HDS and HCU
- Professional support during all phases of the project, including site inspection and installation supervision

Harsh process conditions inside the reactors (corrosive media, high temperature and pressure, high mechanical stress) warranted a thorough testing scheme including documentation



The iTHERM MultiSens multipoint assembly with 27 independent thermocouple sensors provides accurate temperature profiling in the reactor.

to ensure the integrity of the devices, a safe startup and operation:

- Dye penetrant test
- Ultrasonic inspection
- X-ray analysis on diagnostic chamber and on TC hot joints
- 5-point TC calibration
- PED certification.

#### Solution components

- Instruments: 2 iTHERM MultiSens TMS02 multipoint assemblies
- Sensor elements: 27 individual thermocouples type K, Ø8 mm, up to 21 m long  
Construction according to ANSI MC 96.1
- Process connection: Flange 6"; #900
- Accessories: Diagnostic chamber with 3-way manifold for draining and pressure control

**Project success** was ensured by the experienced Endress+Hauser project team:

- **Thorough preparation**  
Site visits and requirements clarification meetings
- **Planning and consulting**  
Constant and intensive contact with the Preem engineering office was key to quickly and accurately specify the optimal design and features
- **Production**  
Following order placement in November 2014, the multipoint assemblies were manufactured to spec and shipped on time
- **Installation**  
Five days were needed for the installation of the device and its support frames. Intallation was completed in April 2015.
- **Post-installation support**  
Professional service and support after installation ensured trouble-free startup of the units

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