

# SIMON



## Silicone Fluid Maintenance and Operation

Duration: November 2017 – October 2019

**SIMON** demonstrates the applicability of two advanced HELISOL® products:

a) HELISOL® XA, with a reduced vapor pressure compared to its predecessor HELISOL® 5A will be tested at the PROMETEO facility on a loop-scale,

b) HELISOL® LP, which will not generate cyclic byproducts during long-term operation will be prequalified at the REPA test facility. Therefore, this Si-HTF will be free of EHS classification even after extended use.

SIMON also demonstrates a novel developed separation concept for typical gaseous decomposition products of silicone oils such as methane, ethane, hydrogen and low-boiling alkylsilanes as well as a reconditioning procedure to control and maintain the viscosity of HELISOL® XA during long-term operation.

In addition, investigations on specific fluid key characteristics will be carried out e.g. validation of an inline high-temperature viscosity monitoring system and the demonstration of a high-temperature thermal conductivity sensor.



The **REPA test rig** is designed for endurance studies of **Rotation and Expansion Performing Assemblies** in parabolic trough collector applications.

A trace heating system enables uninterrupted operation of an app. 500 liter HTF circuit at a maximum temperature of 450 °C and 40 bars.

These are ideal conditions to approve new REPAs, suitable for operation conditions at higher temperatures and to demonstrate long-term operation at a small but relevant scale, incorporating the same materials and similar components like in full-scale applications.

The **PROMETEO test loop** (picture) consists of two east-west aligned parabolic trough collectors "Ibertrough" and the balance of plant. To enable operational risk assessments the PROMETEO facility was equipped with a separate feedline /release line so that specific amounts of HELISOL® can be released at working temperature and pressure (425 °C, 20 bar) to a test site. These release experiments simulate pipe leakages in a realistic plant surrounding and facilitate thus the survey of leakages and potential ignition behavior of Si-HTFs.

Under these conditions, the simulated leakage of HELISOL® 5A with an outlet diameter of 2" shows no self-ignition of the HTF!

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