

Third Party Evaluation of OnGuard™ 3B Analyzer

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ClearPointSM biofilm detection and control program from Solenis is a one-of-a-kind microbiological control solution for industrial cooling towers. This novel program brings together proprietary chemistry, advanced monitoring equipment, and expert service and support to provide a comprehensive safeguard against the biofilm threat.

While the chemistry and service components play a pivotal role in the success of the ClearPoint program, the equipment component is what truly differentiates the technology from other competitive offerings. This new-to-the-world monitoring device, which is only available as part of a ClearPoint program, is marketed as the OnGuard™ 3B analyzer. This device employs an advanced ultrasonic probe to detect biofilm growth in industrial cooling systems earlier than any other commercially available technology. In fact, in 2016, Solenis engaged the Karlsruhe Institute of Technology (KIT) in Karlsruhe, Germany, to evaluate the ultrasonic measurement capabilities of the OnGuard 3B analyzer against a proven laboratory measurement technique. Results from this evaluation not only confirm the early detection capability of the OnGuard 3B analyzer but also the measurement accuracy of the device to be around 10 µm with a resolution of +/- 5 µm.

The evaluation conducted by the KIT is described on the back of this page. Summary results from the evaluation are provided and an excerpt from the report prepared by the KIT are included as well.

For more information about ClearPoint biofilm detection and control program or the OnGuard 3B analyzer, please visit solenis.com/ClearPointKIT.



KIT Evaluation, Results and Report

As part of the KIT evaluation of the OnGuard 3B analyzer an optical window was installed in the pipe wall of the OnGuard 3B analyzer to allow for in situ and non-invasive biofilm visualization by means of optical coherence tomography (OCT). OCT microscopy allows one to take pictures or videos of biofilm, not only of the surface of the deposit but also within the film itself (x,y and z axis), providing good insight into the structure of biofilm. From this data one can calculate biofilm thickness and surface coverage.

A cultivation media was circulated through the test apparatus at flow rate of 25L/minute.

OCT readings and readings from the OnGuard 3B analyzer correlated very well, especially with regard to film thickness as shown in Figure 2. Also the ΔT signal reacted with a similar trend. An OCT thickness reading on day 1 resulted in a measurement of 27 μm while ultrasound measurement with the OnGuard 3B analyzer at the same point of time provided a reading of 26 μm . On day 3, the OnGuard 3B analyzer measured 100 μm and the OCT yielded 86 μm .



Figure 1: Laboratory set up of the OnGuard 3B analyzer and the OCT camera.

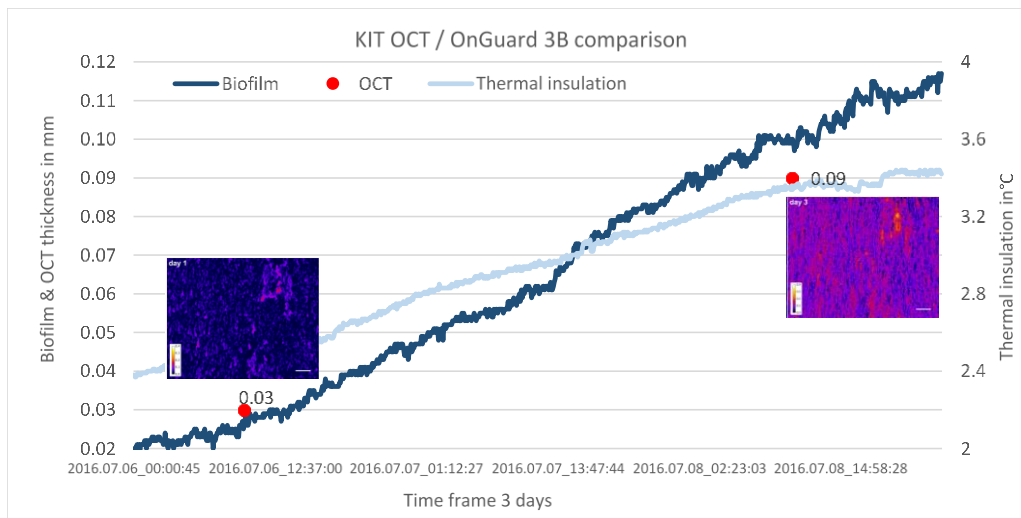


Figure 2: Experimental results from OnGuard 3B analyzer and OCT microscopy (more purple indicates more biofilm).

The following is an excerpt from the report prepared by the KIT following its evaluation of the OnGuard 3B analyzer:

- Both methods revealed similar results. As the standard deviation of thickness calculations from OCT datasets was always greater than the difference between both measurements, the overall results do not allow to conclude that one method is superior to the other. The thickness determinations were comparable.

Commenting on the report prepared by the KIT, Solenis R&D noted that “OCT measurement is a more advanced laboratory method for showing biofilm structure on three-dimensional graphs. We would never claim that the OnGuard 3B analyzer is more precise than the OCT measurement; however, one should not discount the advantage of a continuous measurement over a snapshot picture view.”

About the KIT

Karlsruhe Institute of Technology (KIT) is a public research university and one of the largest research and education institutions in Germany. Created in 2009 when the University of Karlsruhe merged with the Karlsruhe Research Center, KIT is today one of the leading universities in engineering and natural sciences in Europe, ranking sixth overall in citation impact. In research and education, KIT assumes responsibility for contributing to sustainable solutions for the grand challenges that face society, industry, and the environment.