



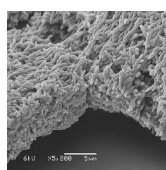
ONGUARD™ 3B ANALYZER THEMADAG INDUSTRIEL KOELWATER

ROZENBURG -NL

Frank Seida – 12.07.2017



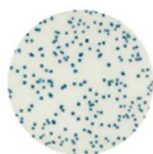
BIOFOULING IS A BIOFILM CHALLENGE



- Highly hydrated slime causes heat exchange loss
- Majority of cells and biomass in the biofilm
- Only minor portion of cells suspended in bulk
- Pathogens require biofilm for multiplication

CURRENT BIOFILM MEASUREMENTS

- Measurements of microbes in bulk not predictive for biofilm

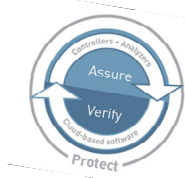
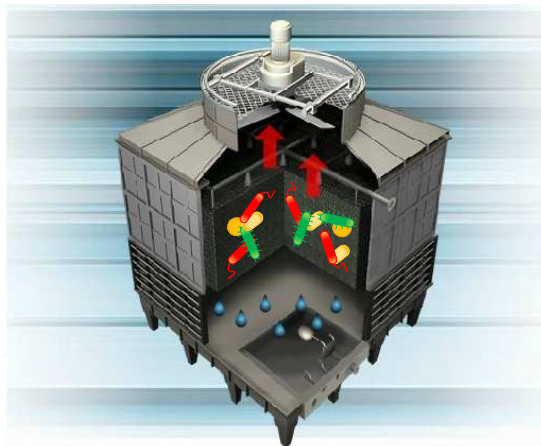


Only a minority of all microbes can be cultivated using current laboratory techniques

"The great plate count anomaly"



What if ...

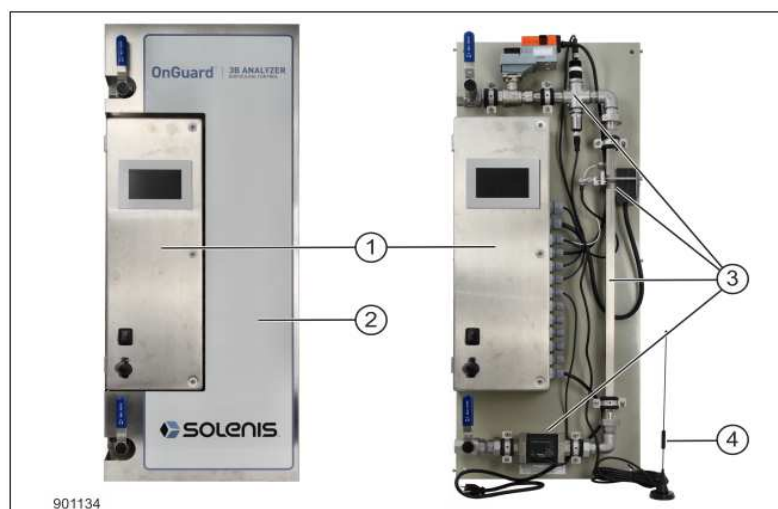


... a technology called OnGuard™ 3B opens a real time window into your process?

4 Confidential and proprietary.



ONGUARD™ 3B ANALYZER – BIOFILM MONITOR



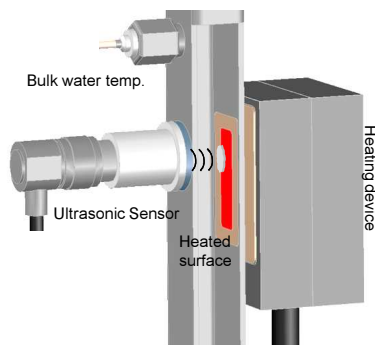
1 Controller | 2 Flow cell cover | 3 Flow cell with sensors and heated target | 4 Radio modem antenna

5 Confidential and proprietary.



ONGUARD™ 3B ANALYZER – BIOFILM MONITOR

The Measurement Cell



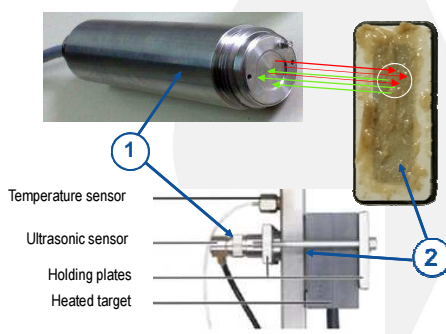
6 Confidential and proprietary.



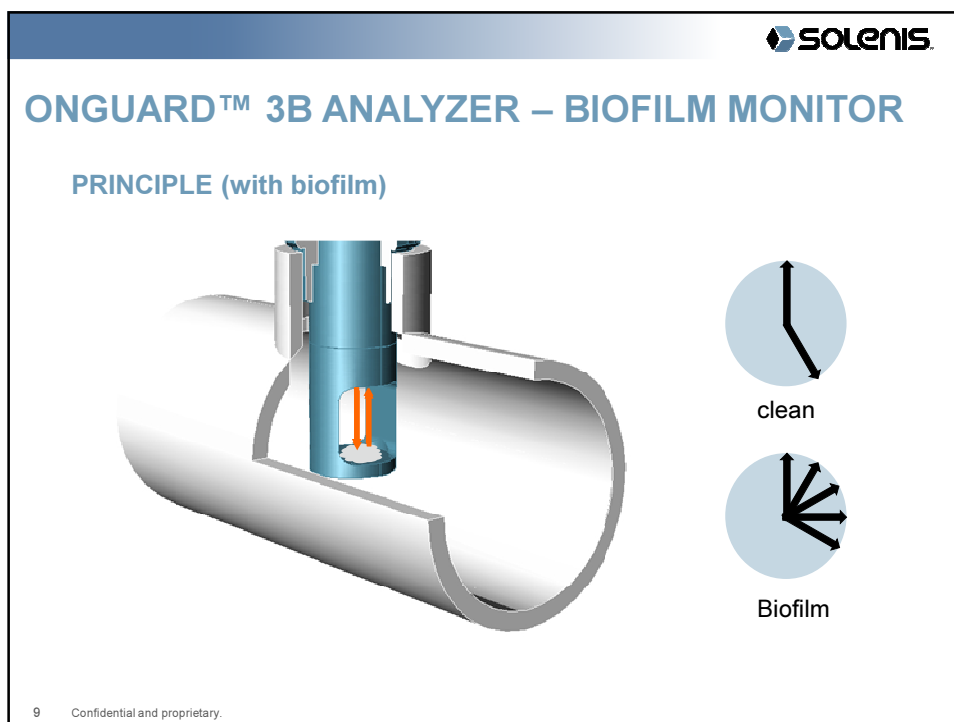
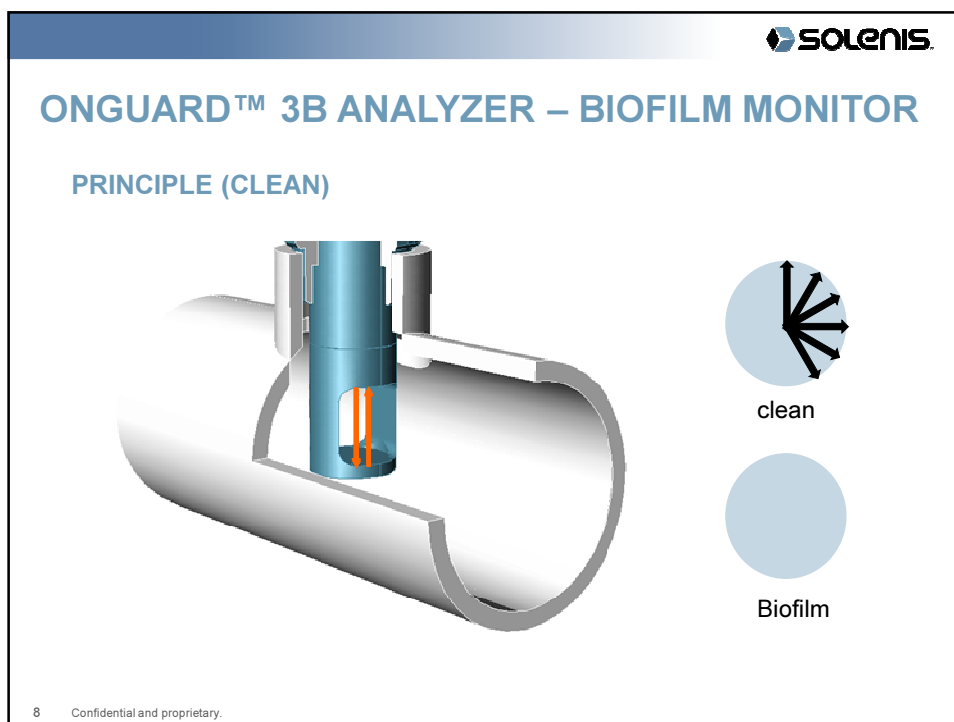
ONGUARD™ 3B ANALYZER – BIOFILM MONITOR

Real-time and non-destructive biofilm monitoring via:

- ① Ultrasonic **biofilm thickness** measurement
- ② Deposit **heat transfer impact** measurement



7 Confidential and proprietary.

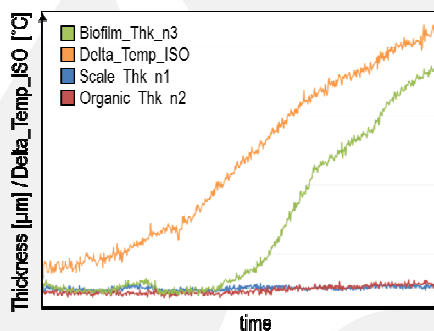




ONGUARD™ 3B ANALYZER – BIOFILM MONITOR

Uses the measurement of four lead signals to determine deposit quantity and quality:

- **Heat transfer impact**
(Delta_Temp_ISO)
- **Biofilm thickness**
(Biofilm_Thk_n3)
- **Organic thickness**
(Organic_Thk_n2)
- **Scale thickness**
(Scale_Thk_n1)



The OG3B is able to differentiate between hard deposits (scaling) and soft deposits (organic-, and biological fouling).

10 Confidential and proprietary.

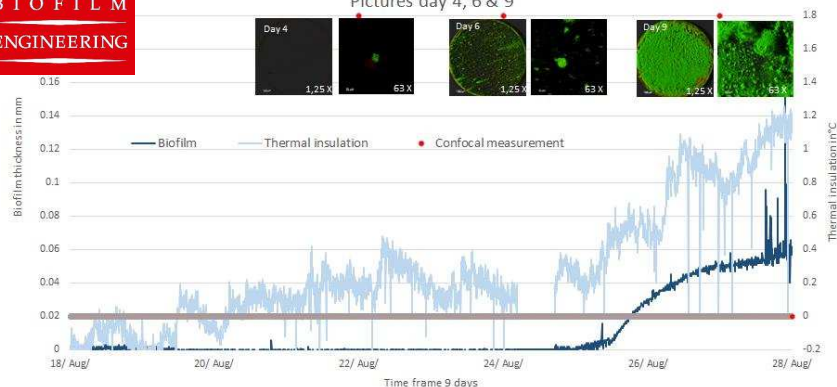


ONGUARD™ 3B ANALYZER – REFERENCES

CENTER FOR
BIOFILM
ENGINEERING

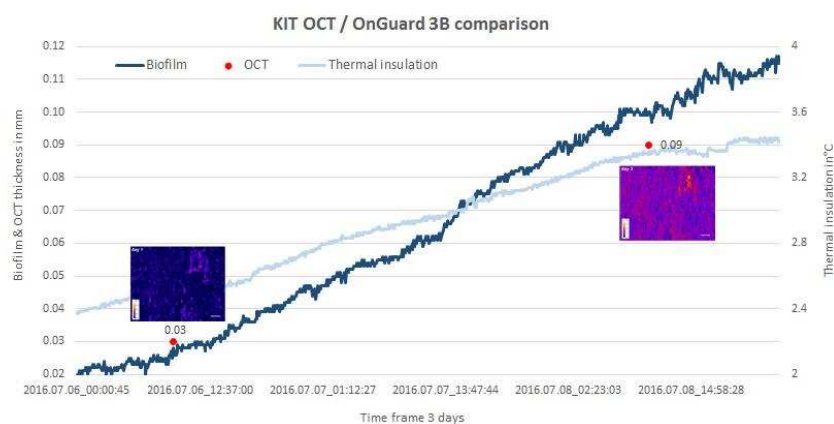
Montana Biofilm confocal images/ OnGuard 3B comparison

Pictures day 4, 6 & 9



11 Confidential and proprietary.

ONGUARD™ 3B ANALYZER – REFERENCES

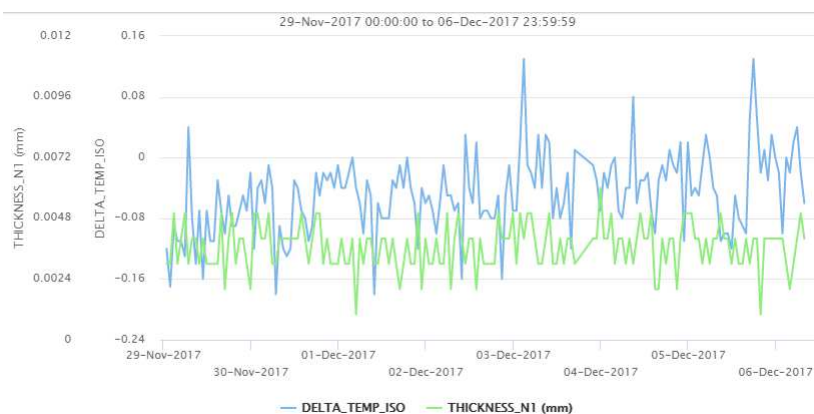


Karlsruhe Institute of Technology, Engler-Bunte-Institut, Water Chemistry and Water Technology
Contact: Dr. rer. nat. Michael Wagner

12 Confidential and proprietary.

ONGUARD™ 3B ANALYZER – REFERENCES

On Site measurements



13 Confidential and proprietary.



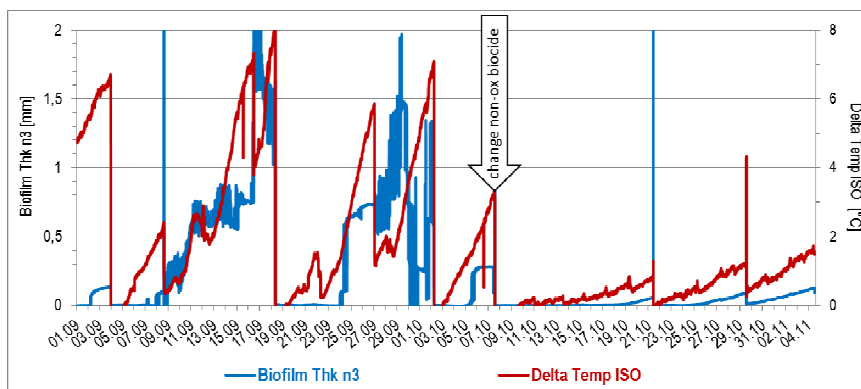
ONGUARD™ 3B ANALYZER – REFERENCES

Biocide Screening

- Benchmark of two organic biocides under on site conditions



Biofilm thickness @ 0.8°C Delta Temp ISO



14 Confidential and proprietary.



Thank You!
Questions?



15 Confidential and proprietary.