



SANCHIP

“Enhancing Rotating Machinery Reliability with Real-Time Oil Condition Monitoring”

Simone Mozzon, PhD – Operations Engineer @ SanChip SRL



LUBRICANT
EXPO EUROPE

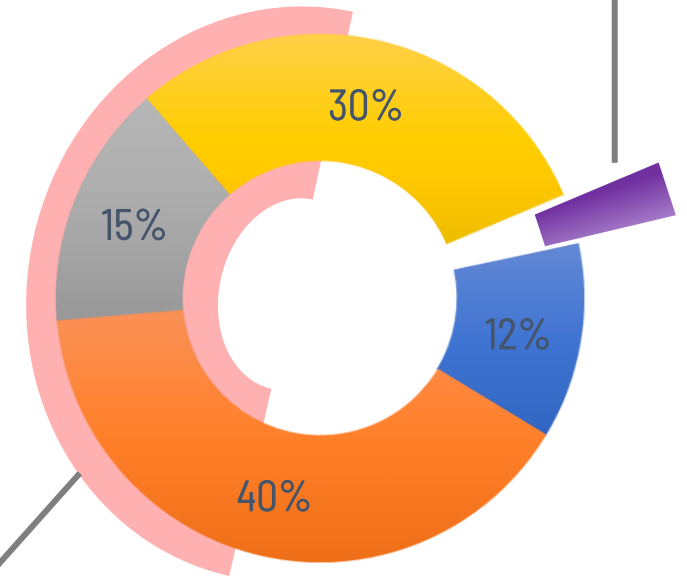
17 - 19 September 2024
Messe Düsseldorf, Germany

"It is almost impossible in the modern industry to have a machine that does not employ rotating elements"



3 % Cost of Lubricants in the maintenance budget

- Misc. Material
- Components
- Overtime Labor
- Labor

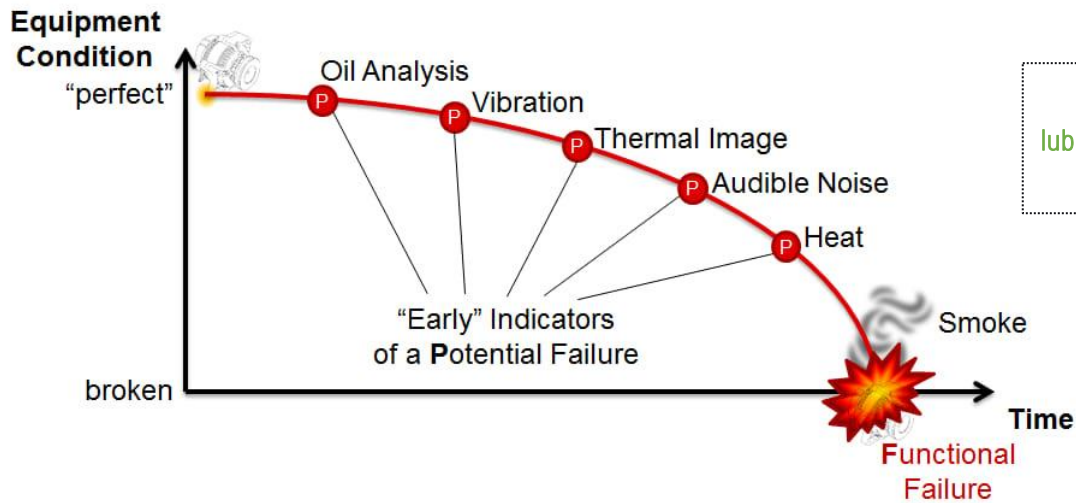
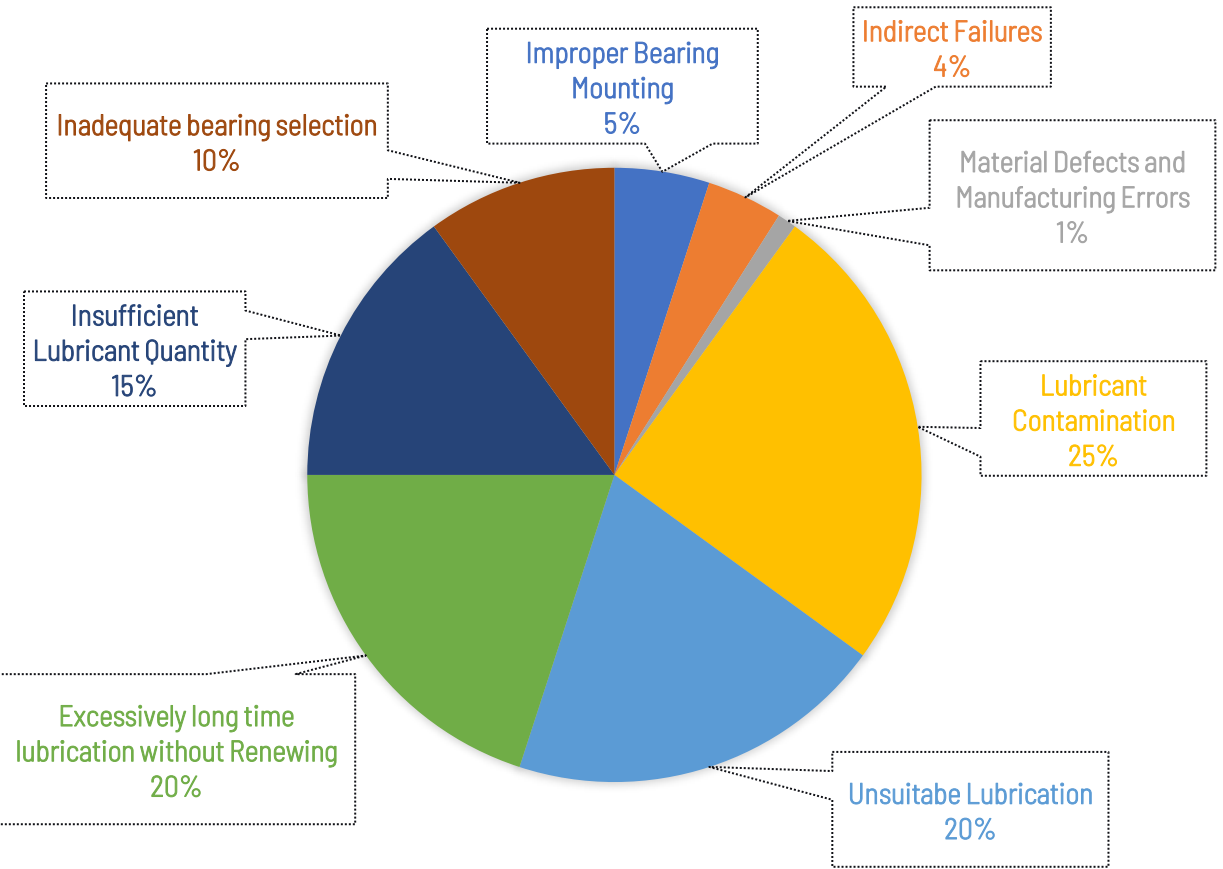


40% Maintenance Costs influenced by Improper Lubrication

THE IMPORTANCE OF LUBRICATION



80%



Oil Condition Monitoring & Analysis

CURRENT APPROACHES

Lab off-line Analysis



Inline & Real-time Sensors



CURRENT APPROACHES

Lab off-line Analysis



- Periodic spot analysis of oil samples taken from the machine
- Detailed analysis, three fundamental aspects:
 - The chemical-physical condition of the oil (viscosity, acidity, additives, chemical alterations)
 - The presence of contaminants (water, dust, process fluids)
 - The presence of wear metals
- Verify the efficiency of the machinery and high accuracy

LIMITS



Long lead times for analysis and reporting (not very reactive approach)



High probability of not diagnosing anomalies due to low sampling frequency,
3-4 Samples/year → Lack of information between one sampling and the next.



Delicate and expensive sampling phase – Probability of unrepresentative samples



CURRENT APPROACHES

Inline & Real-Time Sensors



- 24/7 Monitoring
- Reactive and more predictive approach
- Limited or global information compared to laboratories – complementary to laboratory analysis

REAL-TIME & Inline Oil Condition Monitoring Sensor

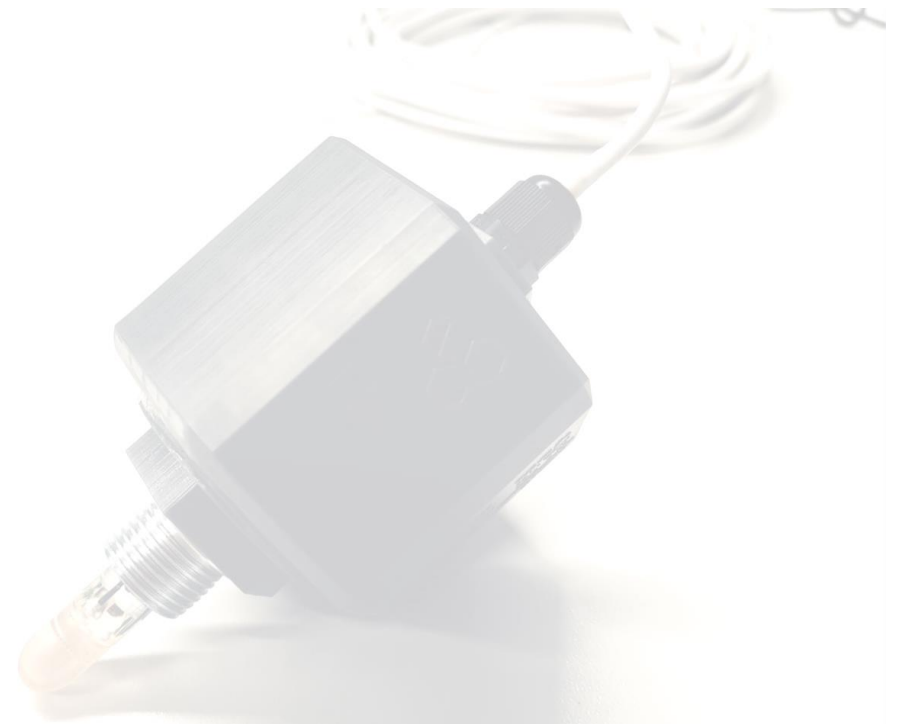
Contamination & Degradation



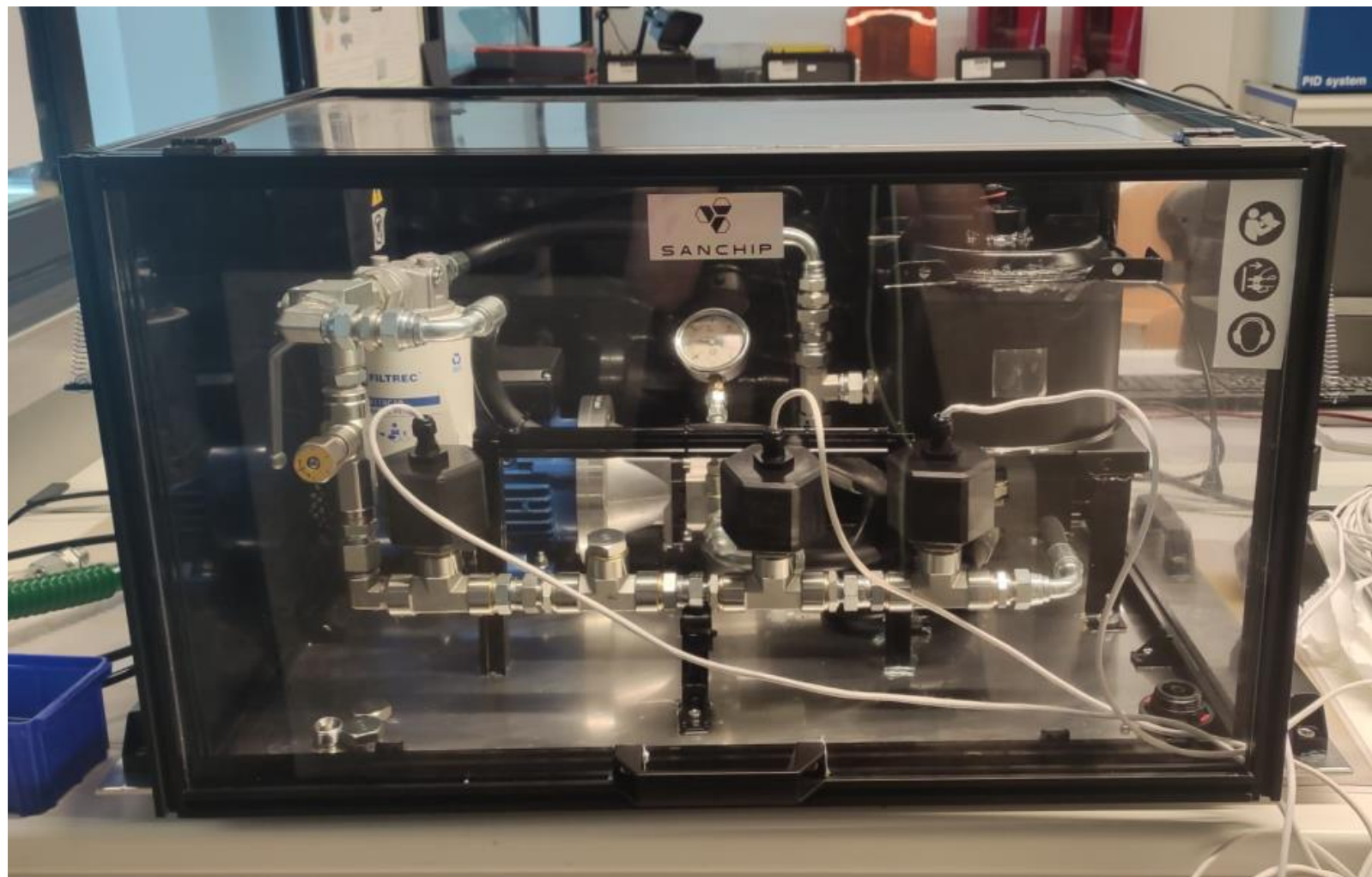
Water Content



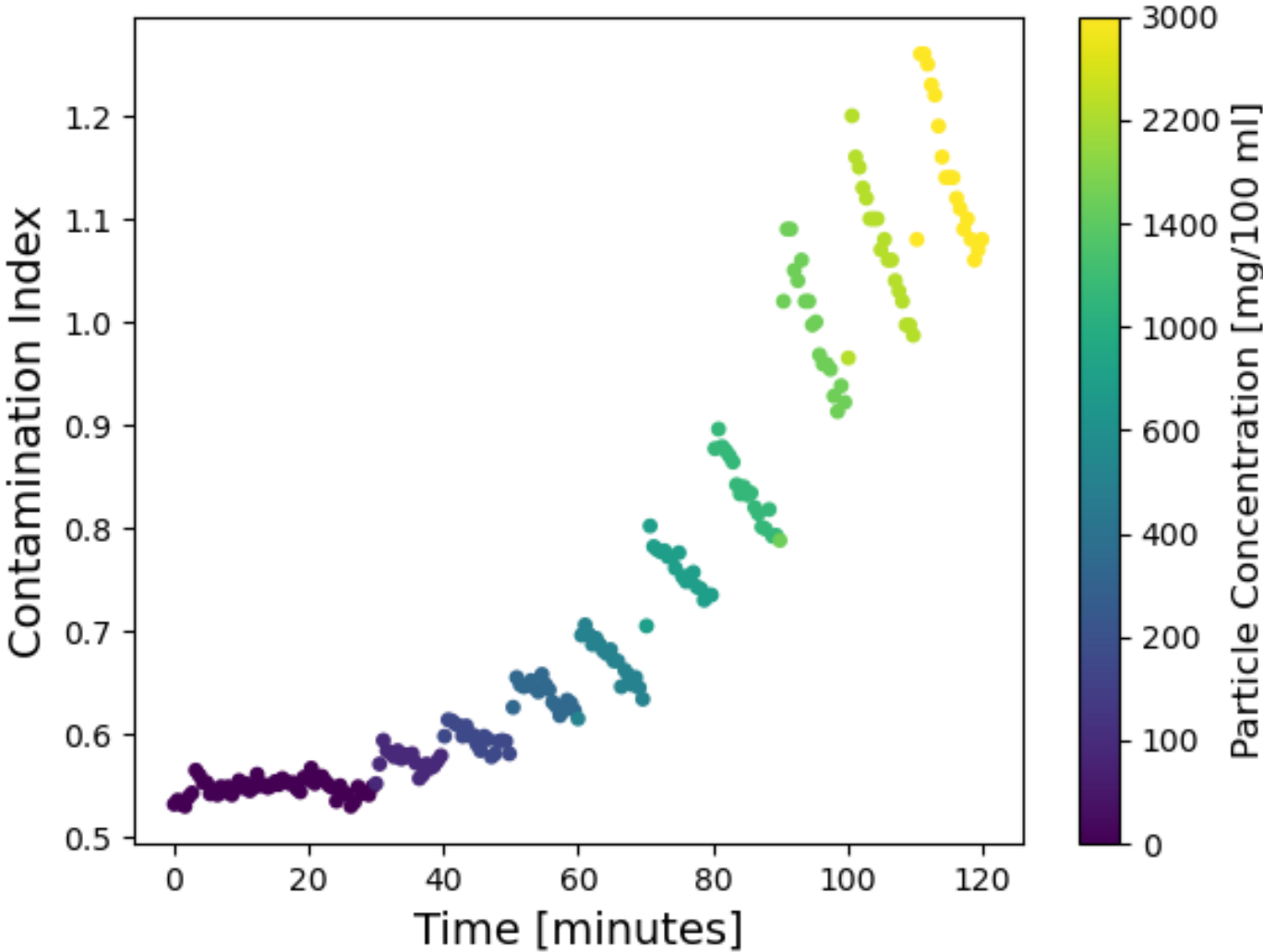
Working Temperature



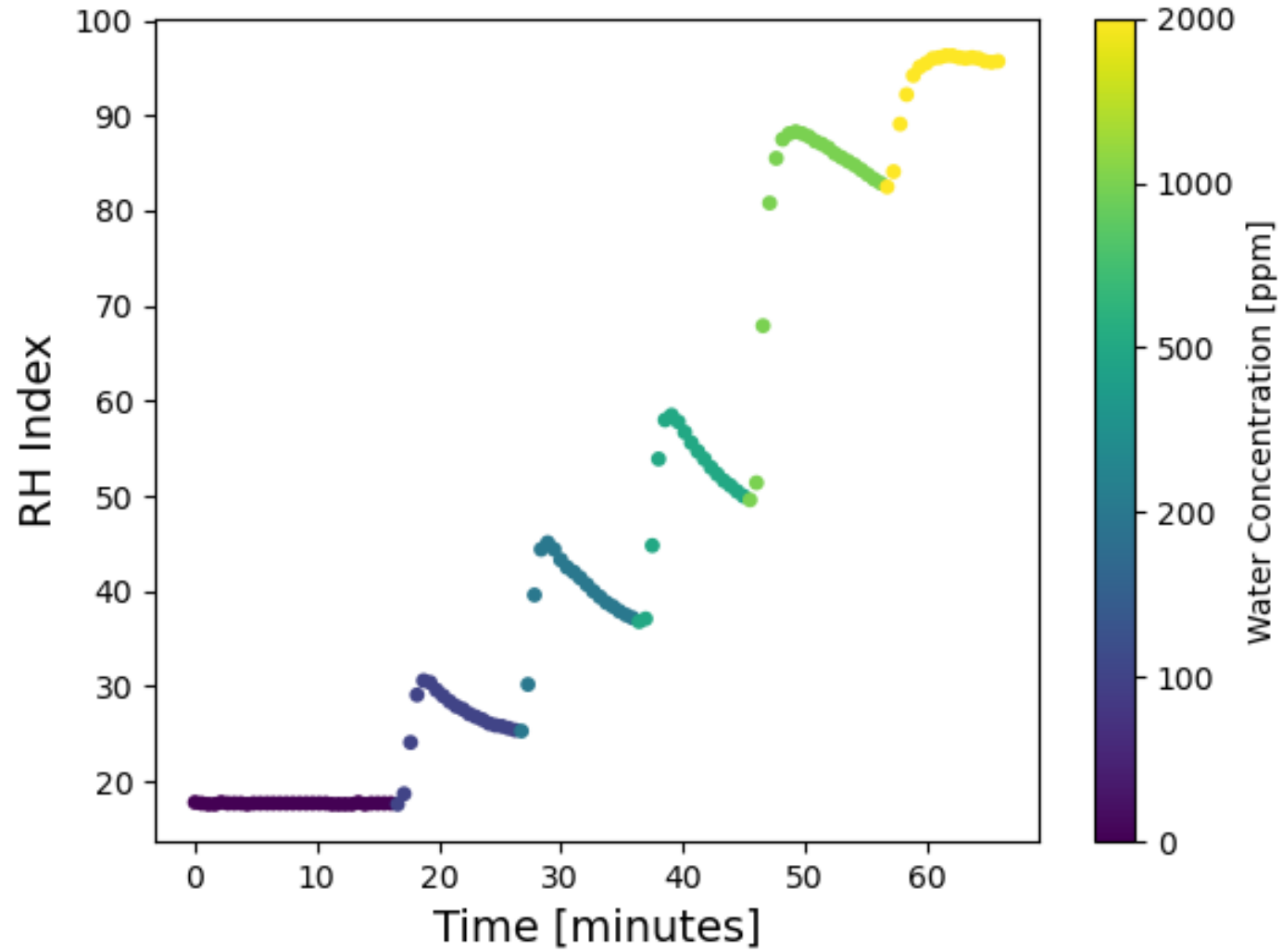
TEST BENCH



METAL PARTICLE SENSITIVITY



WATER SENSITIVITY



CASE STUDY

In collaboration with:



"IoT Bonfiglioli Project"

TRENTINOSVILUPPO
IMPRESA INNOVAZIONE MARKETING TERRITORIALE

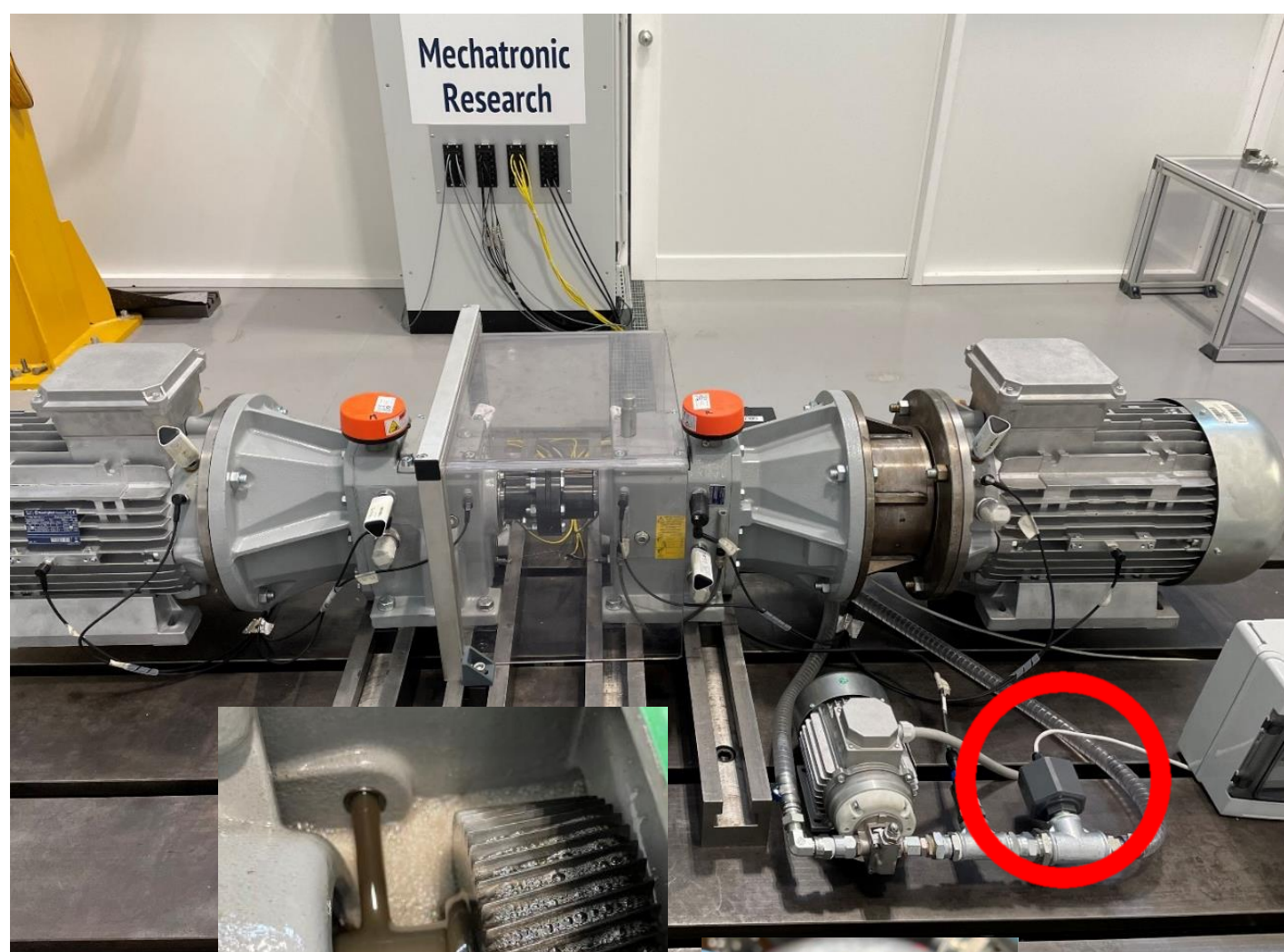
Technical Details

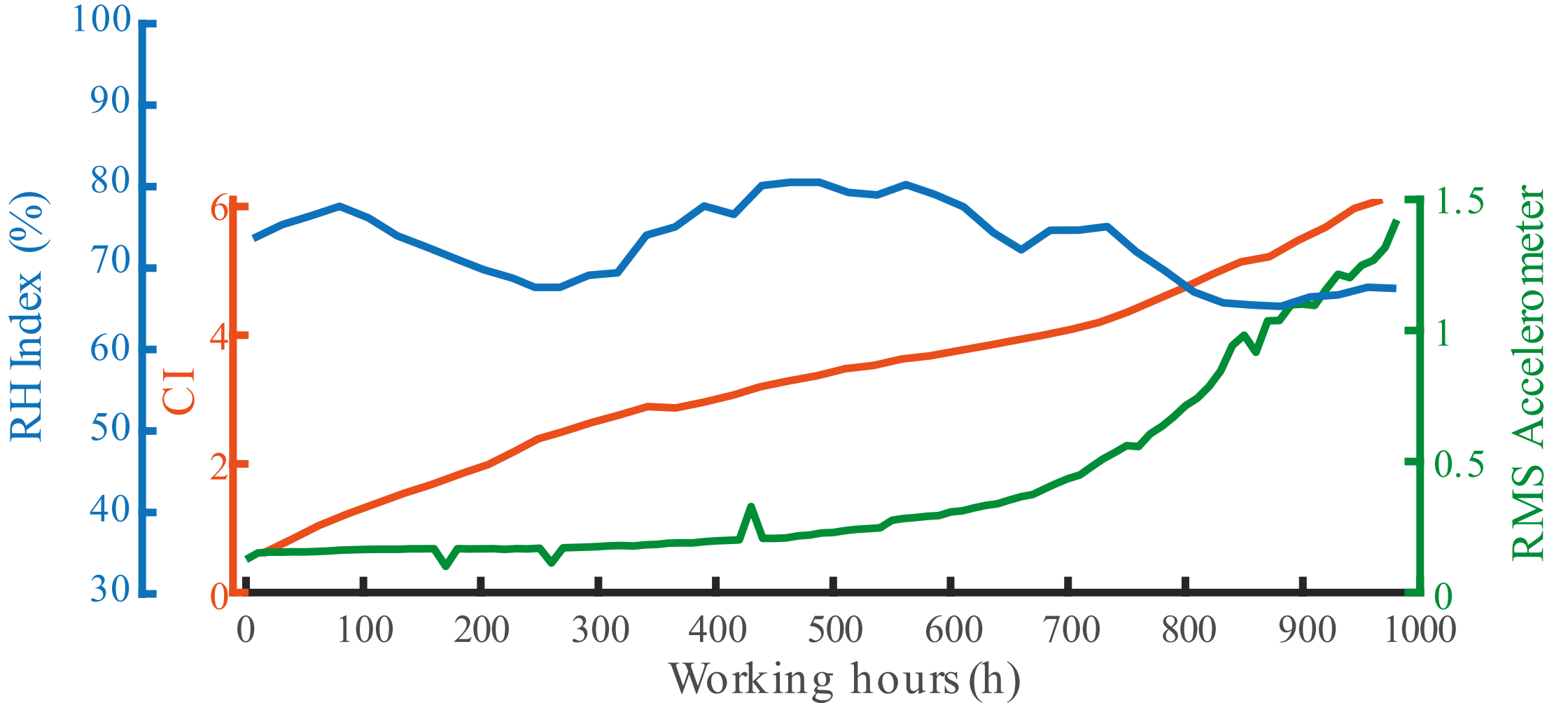
Type of Asset: Gearbox

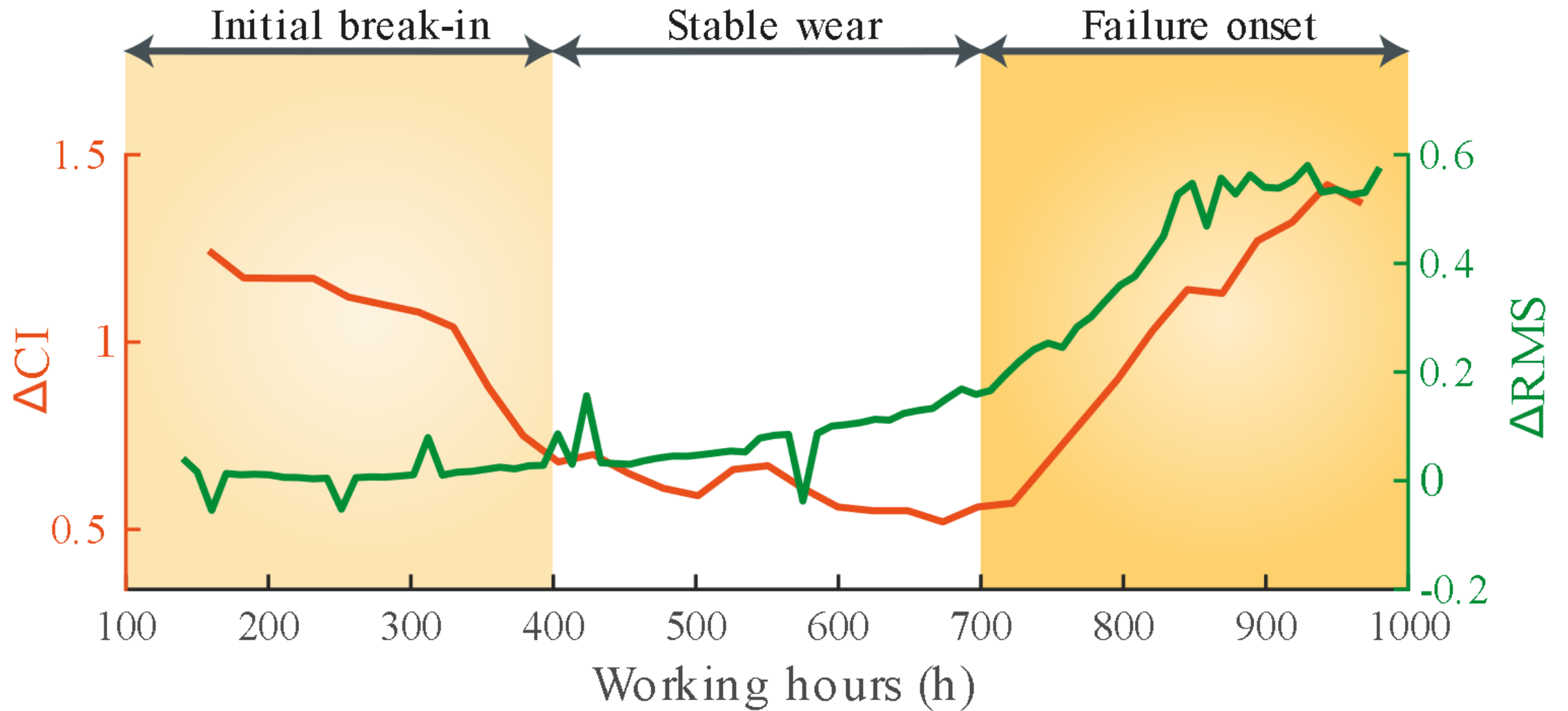
Duration: 1000 h

Oil type: Shell Omala S4 WE 320

Pump cycle: 3h/day







LABORATORY ANALYSIS COMPARISON

OIL ANALYSIS BY BONFIGLIOLI'S IN-HOUSE LABORATORY.

Standard	Parameter	0 h	430 h	900 h	1050 h	1050 h (tank bottom)
ASTM D8120-17	Total Ferrous Particles content (ppm)	47.0	156.0	918.0	1128.0	>9999.0
ASTM D6304	Water (ppm)	5439.0	6239.0	5751.0	5526.0	6453.0

Instrument: Spectro Scientific's FerroCheck 2000 and Karl Fisher Method

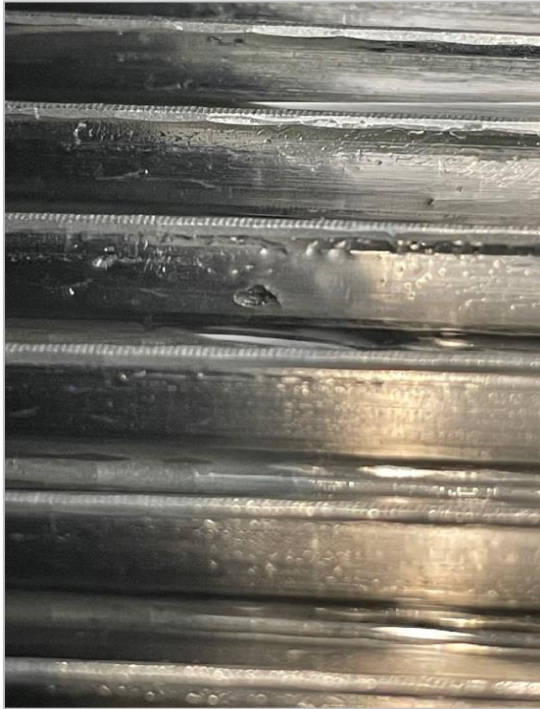
Total Ferrous Particles content, after 1050 hours the sample taken from the bottom of the tank was found to have an abnormal particulate content!

The water concentration remained stable at around 0.5/0.6%, which is quite high but still acceptable for PG oils that can emulsify water well



GEARBOX WEAR PROGRESSION

400 h



600 h



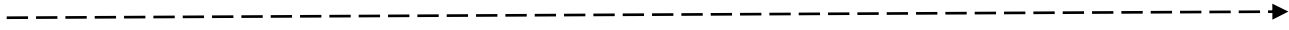
900 h



1050 h



Micropitting



FAILURE



CONCLUSION: WHY CHOOSE REAL-TIME OIL CONDITION SENSORS?



Continuous an immediate Monitoring: Downtime Reduction and identification and resolution of issues before they become critical.



Reliability and Accurate Trend Analysis: No lack of information and elimination of sampling errors. Improvements of predictive capabilities and lifecycle management of equipment.



Operational Efficiency : Optimization of intervention times and reduction of maintenance costs.





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Thank you for the attention!

simone.mozzon@sanchip.net

Via del Fanuccio, 99/A
55014 Capannori | Lucca

info@sanchip.net
www.sanchip.net



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