



## MachineWatch® Case Study

### Detecting wear metals in oil with MachineWatch®

#### How monitoring oil conductivity provides real-time detection of wear metals in oil

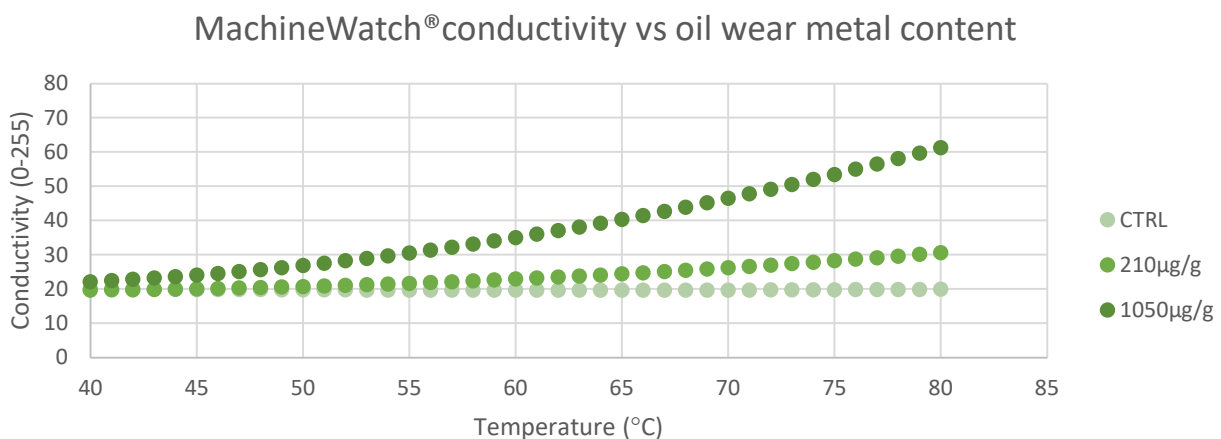
Wear metals in oil, such as copper and iron, serve as an indicator of equipment health and an early warning of potential damage or failure. Monitoring the concentration of wear metals in oil and its relative change over time can therefore help prevent costly equipment damage, downtime and can extend machinery life.

This study demonstrates the efficacy of MachineWatch® in detecting wear metal levels in oil through its novel conductivity readings.

#### The experiment

Three oil samples (including one control sample) containing varying concentrations of wear metals were tested using MachineWatch®. The control sample, a 75 cSt mineral oil, contained less than 1 µg/g trace elements of wear metals. The other two samples contained wear metal concentrations of 210 µg/g and 1050 µg/g respectively. All three samples were manufactured and certified under a quality control system accredited to ISO 9001 and ISO/IEC 17025 standards.

Each sample was slowly heated up to a temperature of 80 Celsius degrees and then left to cool back down to room temperature with MachineWatch® taking measurements at five-minute intervals. This process was repeated for each of the three samples. The data collected by MachineWatch® in this experiment is shown in *Figure 1*.



*Figure 1- Processed data from MachineWatch® demonstrates the relationship between conductivity and wear metal concentration in oil.*

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The graph demonstrates the relationship between oil conductivity and wear metal concentrations in oil<sup>1</sup>. As depicted in the graph, the control sample experienced little to no change in conductivity, as it only contained traces elements of wear metals. The 210 µg/g sample experienced a slight increase in conductivity, while the 1050 µg/g sample experienced a drastic increase in conductivity.

The data therefore indicates that a higher wear metal concentration in an oil sample corresponds to a higher conductivity reading.

By detecting changes in wear metal concentrations in oil, MachineWatch® provides decision makers with accurate, up to date information to make informed choices. Continuous monitoring means that MachineWatch® can provide early detection of increases in wear metal concentrations, as well as monitor concentration trends over time.

### About Oil Advantage

Oil Advantage provides cost-effective, real-time oil condition monitoring, empowering decision makers to act with data-driven insights, improving the operational performance and lifespan of critical equipment.

Our sensors require no calibration and are compatible with all commercially available oils. They are maintenance-free, durable, and designed to last the lifetime of your equipment. Data collected over a given period can provide valuable insight on machine performance and helps you to plan your preventative maintenance routine.

When trialling our equipment as an early warning system or for continuous condition monitoring, we help you interpret your data before developing intelligent dashboards and automated notifications that suit your business' unique needs and workflows.

**Contact us for an obligation-free consult or to test drive a MachineWatch® sensor.**



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<sup>1</sup> Note: oil conductivity is a function of temperature

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