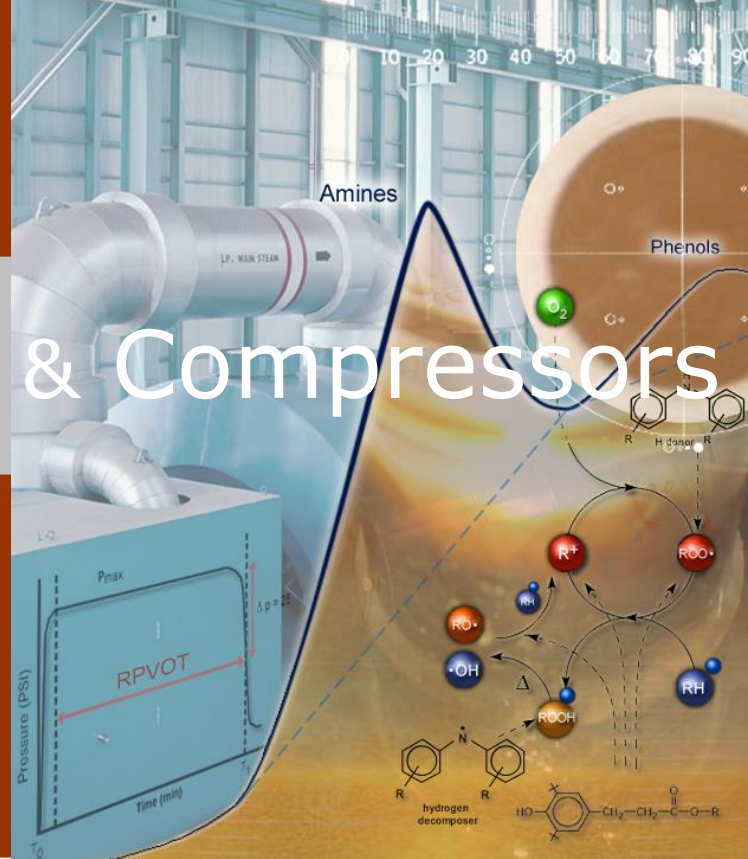


# Advanced Oil Monitoring

Predictive Analysis for large Industrial Systems

# Industrial Turbines & Compressors

LARGE INDUSTRIAL TURBINES AND COMPRESSORS REQUIRE THE COMPREHENSIVE OIL TESTING PROVIDED BY WEARCHECK ADVANCED OIL MONITORING TO ENSURE THE OPERATIONAL INTEGRITY OF THE SYSTEM LUBRICANT.



## OVERVIEW

- Monitors industrial turbine and compressor oils potential for harmful varnish and sludge build-up.
- Comprehensive testing and reporting makes the decision between oil extension and oil replacement easy.
- Provides a level of confidence on the operating condition of your critical systems.
- Suitable for all large industrial gas, steam, hydro-electric and aero-derivate turbines and large rotary and reciprocating compressors.

## BENEFITS

**In today's world companies rely on turbines and compressors** to provide power and gas transportation for core processes. Turbines and compressors already have demanding lubrication requirements and those demands are increasing. More demands are being put on these fluids as reservoir size and working clearances decrease and system power outputs, pressures, temperatures and oil service life increase. Lubricants must be highly oxidative and thermally stable to be able to handle high operating temperatures. Additionally the lubricant must remain contaminant free to properly lubricate bearings and gears, and to act as a favourable hydraulic medium for governors and valving systems.

**Oil oxidation and sludge will lead to sticking servo valves** meaning turbines will not start on demand. Oil contamination will accelerate wear, cause governors and valves to operate erratically and plug system filters. Unmonitored, poor oil condition leads to unplanned outages which are extremely expensive. Besides repair and maintenance companies may have to purchase power off the power grid at costs exceeding \$50,000 per day.

**In order to achieve peace of mind** on the operating condition of your turbine and compressor lubricants you need the comprehensive testing that WearCheck Advanced Oil Monitoring provides. Specifically designed for industrial turbines and compressors, WearCheck's advanced oil monitoring combines well established industry tests with more recent advances in industry testing to provide an unparalleled view of the operating condition of your critical lubricants.

**WearCheck's Advanced Oil Monitoring** determines the levels of remaining anti-oxidants in the oil, detects for unwanted oil contamination and will accurately determine the suitability of the lubricant for continued use. A comprehensive diagnosis will warn you of any potential for damaging varnish build-up and includes recommendations for any necessary maintenance actions to remove contaminants and restore the lubricant to proper operating conditions.

**WearCheck's Advanced Oil Monitoring** is intended for use with gas, steam, hydro-electric and aero derivative turbines and large reciprocating and rotary compressors.



# WEARCHECK

THE LEADER IN OIL ANALYSIS

# Advanced Oil Monitoring

Predictive Analysis for large Industrial Systems



## TESTING METHODS

## AOM1 AOM2 AOM3

|  |   |   |   |   |   |
|--|---|---|---|---|---|
|    | <b>ICP Analysis</b><br>ASTM D5185           | Determines the parts per million (ppm) of all wear metals (Fe, Cr, Ni, Pb, Cu...), contaminants (Si, Na, K....), and additives (Ca, P, Zn, Mg, Mo...) in the oil.   | ● | ● | ● |
|    | <b>Viscosity @ 40°C</b><br>ASTM D7279       | Measures the kinematic viscosity of the oil at 40°C to determine if oil is still within specification. High viscosity can indicate oxidation, low viscosity can indicate contamination, improper make-up oil.                   | ● | ● | ● |
|    | <b>Acid Number</b><br>ASTM D664 / D974      | Determines overall acidity of the oil which is an indication of oil oxidation and degradation. Used to determine appropriate change-out interval.   | ● | ● | ● |
|    | <b>Karl Fischer</b><br>ASTM D6304           | Determines level of moisture or water contamination in the oil.   | ● | ● | ● |
|    | <b>Particle Count</b><br>ASTM D7647         | Determine cleanliness levels of oil and generate an ISO Cleanliness Code (i.e. 17/15/12). High particle count levels can indicate gross contaminant ingress, wear, filter by-pass or all of these issues.                       | ● | ● | ● |
|   | <b>Varnish Potential Test</b><br>ASTM 7843  | Measures the relative amount of insolubles present in the oil and the resulting potential for sludge and varnish formation.   | ● | ● | ● |
|  | <b>Voltammetry (RULer)</b><br>ASTM D6971    | Measures the levels of aminic and phenolic anti-oxidants remaining in the oil. Determines the necessity for oil replenishment or replacement.   | ● | ● | ● |
|  | <b>Analytical Ferrography</b><br>ASTM D7690 | Detailed morphological analysis of the wear particles present in the oil. Determines the wear modes present in the system.  |   | ● | ● |
|  | <b>RPVOT</b><br>ASTM D2272                  | Rotating Pressure Vessel Oxidation Test stresses the oil to determine the remaining amounts of anti-oxidants present in the oil.  |   |   | ● |
|  | <b>Foaming Characteristics</b><br>ASTM D892 | Multi-stage test (stages I, II, III for both foaming tendency and stability) Determines the oils tendency to entrap air and cause oil foaming as well as the ability of the oil to dissipate this foaming tendency (stability). |   |   | ● |
|  | <b>Air Release Value</b><br>ASTM D3427      | Provides a comparison of the ability of oils to separate entrained air under operational conditions. Determines if the oil will shed air during reservoir dwell time.   |   |   | ● |
|  | <b>Water Separability</b><br>ASTM D1401     | Measures the oils ability to separate from water.   |   |   | ● |
|  | <b>ASTM Color</b><br>ASTM D1500             | Determines the ASTM color of the oil product. Indication of the degree of oil refinement and useful in determining when the oil is grossly contaminated, oxidized or thermally degraded.  |   |   | ● |
|  | <b>Rust Test</b><br>ASTM D665 (A)           | Indicates how well the oil inhibits the formation of rust in the presence of water contamination.   |   |   | ● |
|  | <b>Sediment Test</b><br>ASTM D893           | Directly measure the amount of insolubles present in the oil. Provides a determination of the amount of sludge forming materials present in the oil (varnish and shellac pre-cursors).  |   |   | ● |

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