

# Turbine and Compressor Lubricant Chemistry Management Solutions





# Lubricant Chemistry Management

## Asset Availability, Predictability and Reliability Are Critical

Uptime and availability are key performance indicators for critical turbomachinery. These critical assets must be available at a moment's notice 100% of the time. What is missing from this equation is that turbine lubricant maintenance focuses on particulate removal only, leaving chemistry in an unmanaged state.

## EPT Clean Oil Exists To Eliminate Lubricant-Related Failures

From the first day a lubricant is put into service, it begins to chemically break down, slowly impairing its physical properties and performance. EPT Clean Oil partners with you to address the root cause of lubricant breakdown, applying science and solutions to transform the way industrial lubricants are used and maintained. We call this Lubricant Chemistry Management.

*Partner with EPT Clean Oil and change the economic and environmental performance at your plant with Lubricant Chemistry Management.*

## Manage Uptime with Lubricant Chemistry Management

Lubricant Chemistry Management places a protective shield over your critical assets. Going beyond particulate removal, we apply technology that actively eliminates chemical breakdown products including varnish precursors and oxidation materials, managing the chemistry in your system on a permanent basis and eliminating lubricant-related failure.

## Deliver Unmatched Results and Asset Performance

Lubricant Chemistry Management delivers unmatched economic and environmental returns, mitigating failure costs and lubricant-related carbon emissions. Target the root cause of oil breakdown and failure and take your maintenance program to the next level.



**LUBRICANT CHEMISTRY MANAGEMENT**





# It Starts With Lubricant Condition Monitoring



The foundation of critical rotating equipment and hydraulic system maintenance programs starts with the right test, at the right time and to the right ASTM standard. When you partner with EPT Clean Oil we provide this foundation, bringing certainty and predictability to your maintenance program.

Our Fluid Technical Center team of subject matter expert professional and Ph.D. chemists provide comprehensive interpretations of your oil's condition and remaining lifetime to optimize, extend and align lubricant asset lifecycles with maintenance windows years in advance.

Submit a sample today and let's get a handle on the condition of your turbine lube oil or control fluid. [lab@cleanoil.com](mailto:lab@cleanoil.com)

## Our ASTM-compliant Testing Packages

<b>Rust &amp; Oxidation Turbine Oil</b> ASTM D4378	<b>Phosphate Ester Fluid</b> ASTM D8323	<b>Aeroderivative Turbine Oil</b>	<b>Anti-wear Hydraulic Oil</b> ASTM D6224
<ul style="list-style-type: none"> <li>▪ MPC Varnish Potential</li> <li>▪ Acid Number</li> <li>▪ Fluid Color</li> <li>▪ Viscosity (40°C)</li> <li>▪ Water</li> <li>▪ ISO Particle Count</li> <li>▪ Dissolved Metals</li> <li>▪ Antioxidant Levels</li> <li>▪ Demulsibility (Steam Turbine Lube Oils)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Acid Number</li> <li>▪ MPC Varnish Potential</li> <li>▪ Patch Weight</li> <li>▪ Resistivity (20°C)</li> <li>▪ Phenol Levels</li> <li>▪ Water Content</li> <li>▪ ISO Particle Count</li> <li>▪ Dissolved Metals</li> <li>▪ Fluid Color</li> <li>▪ Viscosity (40°C)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Acid Number</li> <li>▪ MPC Varnish Potential and Patch Weight</li> <li>▪ Viscosity (40°C)</li> <li>▪ Water</li> <li>▪ ISO Particle Count</li> <li>▪ Dissolved Metals</li> <li>▪ Fluid Color</li> <li>▪ Antioxidant Levels</li> </ul>	<ul style="list-style-type: none"> <li>▪ Acid Number</li> <li>▪ MPC Varnish Potential</li> <li>▪ Antioxidant and AW Additive Levels</li> <li>▪ Viscosity (40°C)</li> <li>▪ Water</li> <li>▪ ISO Particle Count</li> <li>▪ Dissolved Metals</li> <li>▪ Fluid Color</li> </ul>







# Solutions for Rust & Oxidation Turbine Oil

Rust and oxidation turbine oil (R&O) are used in lube oil applications, including turbines, compressors and other bearing applications. While offering outstanding lubricating properties, these lubricants break down due to oxidation, creating dissolved contamination from day one that impairs oil performance and decreases lubricant life. When left unmanaged, these breakdown products are eventually forced out of the oil and form varnish. Our solutions below eliminate varnish and, more importantly, manage the oil breakdown process, eliminating a common cause of equipment failure.



Contact EPT Clean Oil to learn more about these proven lubricant lifecycle solutions for your rust & oxidation turbine oil application. [support@cleanoil.com](mailto:support@cleanoil.com)

## Meet ICB® RO

ICB RO, patented ion-exchange technology, continuously removes varnish precursors and dissolved breakdown products. Rather than waiting for these oxidation products to cause harm, ICB RO breaks the accumulation cycle, eliminating the root cause of varnish formation and improving lubricant performance.



## Meet TMR® N<sub>2</sub>

TMR N<sub>2</sub> is an engineered high purity nitrogen generation system designed to remove 98% of the oxygen present and maintain water at very low levels (<50 ppm total), reducing the rate of lubricant breakdown in atmospheric breathing reservoirs.

## Meet SVR® RO

SVR RO is a skid-mounted dialysis lubricant conditioning system that works 100% of the time, targeting the underlying cause of lubricant failure: chemical breakdown. Backed by patented ion-exchange technology, ICB RO, SVR removes acids and dissolved oxidation material as they are generated. Only by managing oxidation levels and removing oxidation material can the root cause of lubricant deposits, or varnish, be eliminated.



# Solutions for Phosphate Ester Fluid



Phosphate esters are fire-resistant fluids (FRFs) in turbine electro-hydraulic control (EHC) systems throughout the power generation industry. Used primarily for their fire-resistant properties and thermal stability, these synthetic fluids hydrolyze and oxidize readily during service, creating harmful acids and phenols. These breakdown products are established varnish precursors that must be removed to ensure reliable servo valve performance in EHC systems.

Contact EPT Clean Oil to learn more about these proven lubricant lifecycle solutions for your phosphate ester fluid application.  
[support@cleanoil.com](mailto:support@cleanoil.com)



## Meet TMR® N<sub>2</sub>

TMR N<sub>2</sub> is an engineered high purity nitrogen generation system designed to remove 98% of the oxygen present and maintain water at very low levels (<350 ppm total), reducing the rate of lubricant breakdown in atmospheric breathing reservoirs.



## Meet ECR® 10000

ECR 10000 is an integrated skid-mounted system that conditions EHC fluids to the requirements outlined in ASTM D8323. Offering four leading filtration technologies, including patented ICB FRF ion-exchange filters, proprietary ECR Collectors, high-efficiency particulate filtration and TMR® N<sub>2</sub> water removal, the ECR 10000 offers best-in-class maintenance and management of EHC fluid quality, extending life and reliability.

## Meet ICB® FRF

ICB FRF, patented ion-exchange technology, is designed to address phosphate ester chemistry, removing acids, phenols and varnish while simultaneously improving resistivity. More importantly, ICB FRF removes varnish precursors responsible for the primary mechanical failure pathways in EHC systems. With proven results since 1992, ICB FRF is an engineered workhorse designed to address phosphate ester fluid chemistry, preventing EHC failures and saving end-users hundreds of thousands of dollars in costly fluid replacement and system flushing.



## Meet SVR® FRF

SVR FRF is a skid-mounted dialysis lubricant conditioning system designed to protect and manage phosphate ester fluid and asset reliability. Backed by patented ion-exchange technology, ICB FRF, SVR addresses the chemistry of phosphate ester fluids, maintaining key parameters and preventing fluid breakdown. Providing 200-400% more filtration capacity than most OEM systems, SVR provides an engineered solution with redundant fail-safes to return and maintain your phosphate ester fluid reservoir to optimal condition.



# Solutions for Aeroderivative Turbine Oil

Aeroderivative turbine oil, made from high-quality polyol ester base stocks, is used exclusively in jet lube applications because of its high oxidative stability and unique viscosity requirements. From the first day jet lubes are put into service, they begin to break down due to oxidation and hydrolysis, creating dissolved degradation products. These dissolved contaminants are produced from high temperatures, water content and entrained oxygen. Varnish and coking deposits start to form once the lubricant becomes saturated with these dissolved breakdown products.

  
**EPT**<sup>TM</sup>  
CLEAN OIL

Contact EPT Clean Oil to learn more about these proven lubricant lifecycle solutions for your aeroderivative turbine oil application.  
[support@cleanoil.com](mailto:support@cleanoil.com)



## Meet ICB<sup>®</sup> JET

ICB JET, patented ion-exchange technology, continuously removes acids, varnish, oil coking precursors and dissolved contaminants. Rather than wait for these oxidation products to cause harm, ICB JET breaks the accumulation cycle and eliminates the root cause of deposit formation and equipment failure.



## Meet TMR<sup>®</sup> N<sub>2</sub>

TMR N2 is an engineered high purity nitrogen generation system designed to remove 98% of the oxygen present and maintain water at very low levels (<50 ppm total), reducing the rate of lubricant breakdown in atmospheric breathing reservoirs. The combined approach of dissolved contaminant filtration with SVR JET and oxygen/water elimination with TMR N2 maintains these polyol ester lubricants in ideal operating conditions – free of oil breakdown products.

## Meet SVR<sup>®</sup> JET

SVR JET is a skid-mounted dialysis lubricant conditioning system engineered to remove oxidative breakdown materials, including acids and varnish pre-cursors, preventing accumulation and eliminating the varnish and coke deposit formation pathways. Backed by patented ion-exchange technology, ICB JET, SVR reduces and manages Acid Number, so jet lubes no longer have to be condemned based on the acid number.



# Solutions for Anti-wear Hydraulic Oil



Anti-wear (AW) hydraulic oils are found in various applications, from small assembly processes to integrated steel and paper mill applications. Offering excellent protection against corrosive acid and metal surface wear in critical hydraulic systems, anti-wear hydraulic oils break down to form varnish due to oxidation of their base oil and additive depletion.

While the presence of anti-wear additive packages protects hydraulic components, these mineral oil-based lubricants chemically break down over time due to oxygen and heat. As oils chemically break down, acids are generated that attack the oil and mechanical components. Even more harmful, varnish precursors are generated, increasing the tendency for varnish deposits to form on mechanical surfaces. When this happens, the performance and reliability of hydraulic equipment suffer.

Contact EPT Clean Oil to learn more about these proven lubricant lifecycle solutions for your anti-wear hydraulic oil application. [support@cleanoil.com](mailto:support@cleanoil.com)

## Meet ICB® AW

ICB AW, patented ion-exchange technology, selectively removes varnish and key varnish feedstocks continuously. Rather than wait for these break down products to cause harm, ICB AW breaks the accumulation cycle preventing varnish problems.



## Meet TMR® N<sub>2</sub>

TMR N<sub>2</sub> is an engineered high purity nitrogen generation system designed to remove 98% of the oxygen present and maintain water at very low levels (<50 ppm total), reducing the rate of lubricant breakdown in atmospheric breathing reservoirs. The combined approach of dissolved contaminant filtration and removing oxygen and water offers a complete step-change in hydraulic oil maintenance, maintaining these oils in ideal operating condition – free of oxidation products, significantly extending oil life.

## Meet SVR® AW

SVR AW is a skid-mounted dialysis lubricant conditioning system that works 100% of the time, targeting the underlying cause of lubricant failure: chemical breakdown. Backed by patented ion-exchange technology, ICB AW, SVR selectively removes acids and dissolved oxidation material as it is generated. Only by managing oxidation levels can the root cause of lubricant deposits, or varnish, be eliminated.

