

ICB™

Ion Charge Bonding (ICB™) Filter Element Upgrades

A Smarter Approach to Drastically Reduce Production Losses and to Provide Stable, Trouble-Free EHC Fluid



While Fuller's Earth and Selexsorb® filters have been widely used as acid removal filters in phosphate ester based EHC fluid applications, an entirely new level of EHC fluid purification is available through the use of ICB™. ICB™ is a specialized Ion exchange product developed by EPT™ that not only removes acids, but more importantly removes the dissolved contamination responsible for servo-valve sticking (Figure 2). This contamination is normally hidden in the EHC fluid as it is not tested as part of routine fluid analysis. In Figure 1, results of a Depositing Tendency Test are shown. In this test, EHC fluid is mixed with Hexane which forces dissolved contamination out of solution so that it can be viewed. In the first 3 test tubes, EHC fluids using conventional treatment form visible solids when mixed with hexane, while samples 4 and 5 that have been cleaned with ICB, show that this contamination has been eliminated.

This additional benefit of being able to remove this contamination using ICB™ is a game changer for phosphate ester based EHC fluid maintenance. For the past 40 years, steam turbine EHC operators have worked to manage acid numbers and fluid resistivity values, without the ability to remove the contamination responsible for servo-valve sticking. ICB™ removes this limitation, allowing for significantly improved servo valve operation.

WORLD CLASS PRODUCT AND SUPPORT

With 100's of installations operating since 1992, and over 1000 global installations to date, ICB™ has achieved over 30 million hours of operating performance history on some of the largest power stations and turbine fleets in the world. EPT's ICB™ products are supported by a team of world class experts, who are specialists in the maintenance of Phosphate ester fluids. ICB™ offers unmatched performance that will resolve servo valve problems, and when used as part of our Phosphate ester fluid maintenance and testing program will significantly reduce the related risk of production losses.

*Selexsorb® is a registered trademark of BASF.
ICB™ is a trademark of EPT*



When Results Matter

EPT 4772-50th Ave. S.E. Calgary, AB, Canada T2B-3R4
T 403.246.3044 F 403.249.8096 sales@cleanoil.com

KEY FEATURES OF ICB™

1. Removes the dissolved break-down products that are responsible for servo valve failures (See Figures 1 and 2).
2. Dramatically increases fluid resistivity values which eliminates a common servo-valve failure mode referred to as electro-kinetic-wear or valve erosion
3. Unlike conventional products, ICB™ does not contribute fine particulate, or add dissolved metals that normally contribute to increased rates of oxidation.
4. 6-7x more capacity to remove acid than Fuller's Earth
5. ICB™ is available in standard sized filter cartridges or as part of a complete EHC fluid treatment system.
6. Complete stainless steel construction, featuring robotic, spiral welding which provides maximum filter integrity, adding a new fail-safe in the EHC fluid conditioning system.

ICB SPECIFICATIONS

TABLE 1. ICB PART NUMBERS BY TURBINE TYPE	
600502	For small Alstom Steam Turbine EHC system
600503	Standard replacement for GE Steam Turbine EHC system
600504	Standard replacement for Industry standard 6"x18"
600508	Standard replacement for Westinghouse Steam Turbine EHC system
600511	Standard replacement for GE Frame 7B gas turbine
600514	Standard replacement for ABB/BBC Steam turbine using Rotring Treatment System*

* requires adapter component p/n 601245.

See Individual Product Specification Sheets for Additional Information.



Fig. 1 – In Step 1 of the Deposition Tendency Test referred to in the EPRI EHC Fluid Maintenance Guide 2002, Page 4-39, EHC fluid is mixed with Hexane which forces out dissolved contamination into solid form. In the first three test tubes, EHC fluid using conventional treatment form visible solids. Servo-valve performance and reliability would be significantly impaired using EHC fluid in this condition. In the last 2 test tubes where the EHC fluid was cleaned with ICB™, no deposition or solids of any form are observed. Servo-valve response time and reliability would be maximized operating EHC fluid in this condition.

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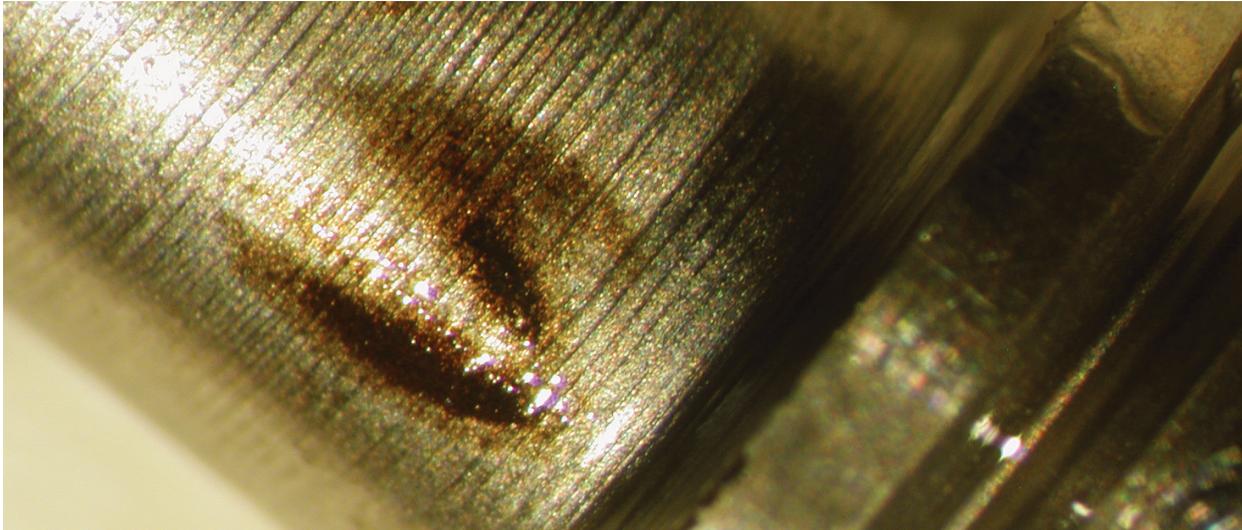


Figure 2—Servo Valve Spool showing signs of fluid contamination deposition. The contamination responsible for these deposits is not routinely measured and in this example the servo-valve would be at abnormal risk level for failure. The Deposition Tendency test as shown in Figure 1, easily identifies if this contamination is present.

RETURN ON INVESTMENT (ROI)

ICB™ filters have a published ROI of 680% saving one large turbine fleet an average of 1 million dollars per turbine. For additional information see Phosphate Ester Maintenance Brochure under ROI.

ADDITIONAL RESOURCES AND INFORMATION

White Paper “Phosphate Ester Fluid Testing and Maintenance Challenges in EHC Systems”, EPT 2015

ICB™ Specification Sheets for ICB™ elements p/n 600502-600524

ICB™ Case Study, EPT™ 2015

Article “Thirty-Seven Years of Fleet Operating and Maintenance Experience Using Phosphate Ester Fluids for Bearing Lubrication in Gas-Turbine/ Turbo-Compressor Applications”, ASTM STP1573, 2014

Article “Phosphate Ester-based Fluid Specific Resistance: Effects of Outside Contamination and Improvement using Novel Media”, ASTM STP 1573, 2014

Article, Trouble-free EHC Fluid Operation, Modern Power Systems, Dec. 2011

CONTACT INFORMATION

For Assistance please contact
sales@cleanoil.com



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