



ICB - DRY ION CHARGE BONDING

ICB Element Upgrades

Eliminate & prevent EHC servo valve sticking and reduce fluid maintenance requirements.

Replaces Fuller's Earth and Selexsorb for EHC systems using phosphate ester.

Eliminate the largest source of fluid contamination and reason for EHC failures.

Remove & maintain Acid Number to < 0.05.

Eliminate gels & deposits by removing dissolved metals (Ca, Mg, Fe, Na, Si, Al).

Phosphate Ester Fluids

For most EHC systems the primary operating fluid is phosphate ester. This is a very safe and effective fluid that when maintained in a narrow condition range regarding acid number, water and particulate can deliver years of trouble-free optimum performance.

When the fluid is not properly maintained the result is servo valve failure. Other issues include accelerated acid production, loss of resistivity, poor air release, premature fluid replacement, costly system flushes and fluid degradation related component failures.

Dissolved Metals, Gels & Deposits

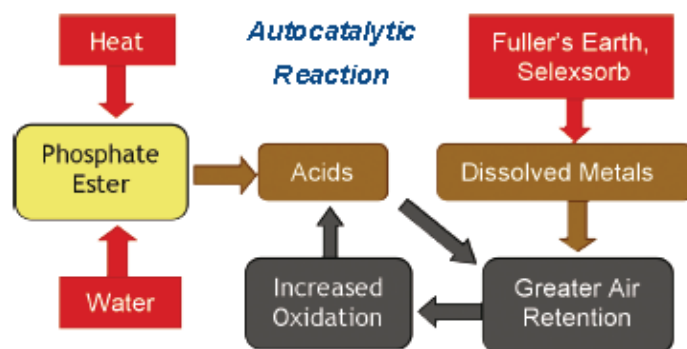
Airborne contamination (i.e. seawater & agriculture - Cl, Mg, Ca, Na) and traditional acid scavenging elements (Fuller's and Selexsorb - Al, Si, Na) contribute dissolved metals to EHC fluid.

As dissolved metals accumulate they act as a catalyst forming depots on servo valves and gels that can cause valve stiction and mask filter elements. ICB elements do not contribute metals and will remove dissolved metals from airborne ingress and element leaching to < 10ppm.

NO METALS = NO DEPOSITS / NO GELS

Acid Production

The primary sources of fluid degradation in phosphate ester are Oxidation (heat) and Hydrolysis (water) which act on phosphate ester to form acids. Dissolved metals from Fuller's and Selexsorb elements enable the acid creating an autocatalytic effect where air retention increases which accelerates oxidation (more acid).



Acid production rates are directly related to the existing Acid Number (AN or TAN). Acid production at AN > 0.20 is significantly higher than at AN of 0.05. The lowest fluid maintenance costs are achieved when the Acid Number is maintained at < 0.05.



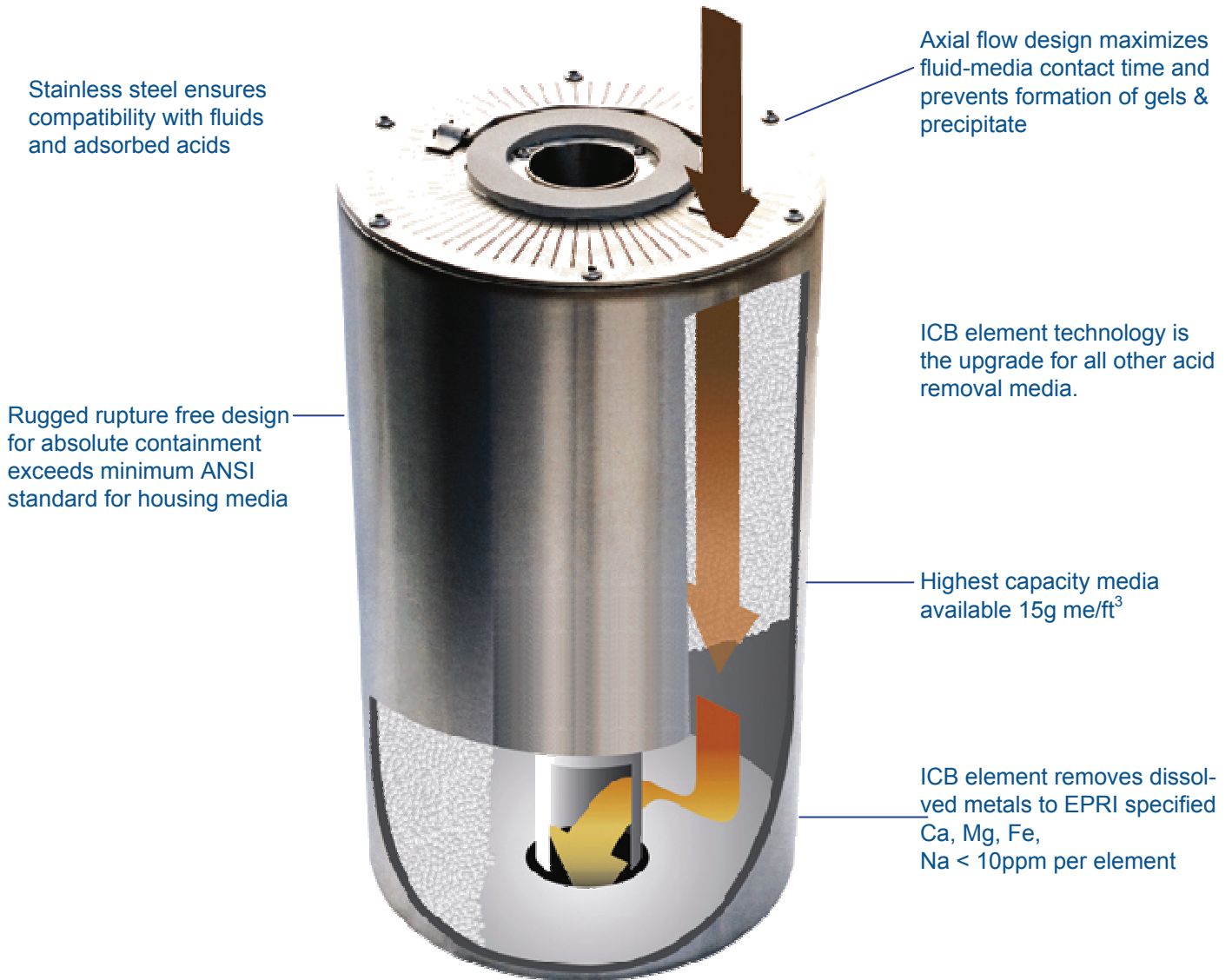
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30 million hours of proven performance

Solving million dollar EHC problems on the largest fossil fuel plants in The U.S.A, Europe & Asia, and on the largest Gas & Steam turbines in the world

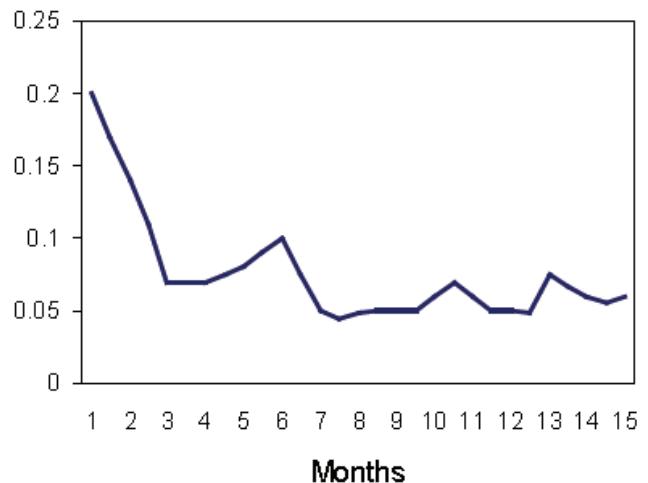
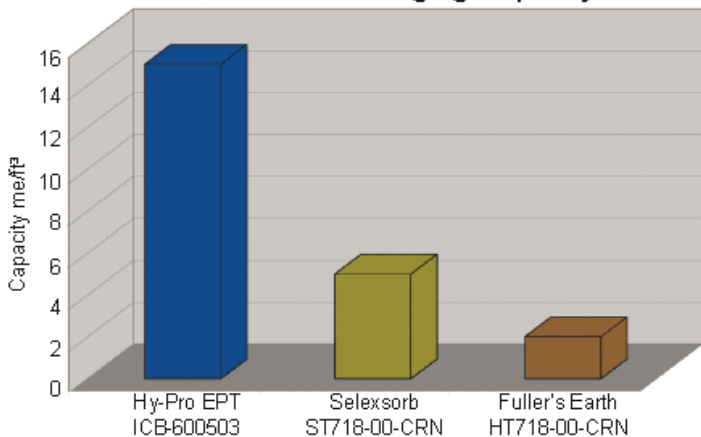


Highest Capacity for Acid Removal

ICB element technology features the highest capacity to remove and retain acid when compared to other medias.

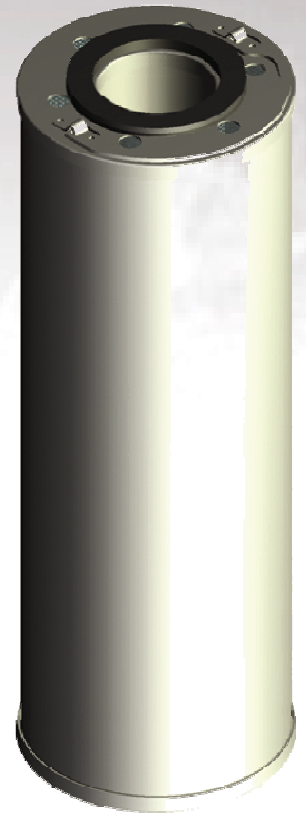
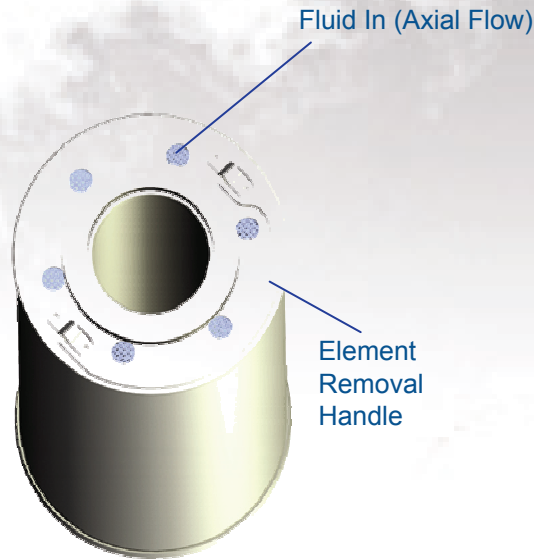
Maintains AN of < 0.05. AN reduction up to 0.5 AN in 24 hours has been achieved.

Acid Scavenging Capacity



ICB Single Use Element Upgrades

Single use ICB element designs are the standard replacing the original rechargeable element. The single use platform reduces cost of ownership by reducing element hardware & production costs and eliminating double freight and hazardous material shipping challenges.



ICB Single Use Elements - Materials of Construction

All Hardware - 304 Stainless Steel

Gasket seal material - 0.250" thick Silicone (600508 Utilizes viton gasket standard)

Bonded end caps cured with chemically compatible high strength epoxy (rated to 450 psi / 31 bar Max OP)

Static pressure tested to 120 psi / 8 bar

Disposal - The ICB cartridge should be disposed of in accordance with the disposal regulations of the fluid it is used to treat, same as standard hydraulic and lube filter elements.

Acid Scavenging Technology Comparison

ICB Ion Charge Bonding	Selexsorb	Fuller's Earth
+ Eliminate regular fluid replacement	Made from purified activated Alumina as a Y-Zeolite	Made from magnesium oxide and hydroxide, processed from attapulgus clay or attapulgite
+ Eliminate costly system flushes		
+ Avoid unscheduled down time	Removes acid but re-contaminates your fluid (Sodium, Aluminum, Silicon)	Removes acid but re-contaminates fluid (Magnesium, Iron, Calcium)
+ Avoid equipment failure resulting from fluid degradation		
+ Does not produce gels	These by-products react with fluid to cause soft gel deposits	Produces hard salts and soap deposits that coat sensitive servo valves
+ Does not produce dissolved metals	Gel increase friction and restrict flow	
+ Before and after lab analysis to verify results provided	Cause reliability issues	Much lower capacity to remove acids than ICB
+ Axial flow design maximizes media and fluid contact time (residence time)	Selexsorb has a radial flow design as to an axial flow	Fuller's Earth has a radial flow design as to an axial flow
+ Widest range of ICB acid scavenging elements available to solve any EHC problem to your requirements	Housing design not as robust as ICB	Housing design not as robust as ICB

ICB ELEMENT PART NUMBER ORDER GUIDE AND DIMENSIONAL DESCRIPTION



ICB Part Number	Nominal ID x OD x Length
ICB-600501	1 ^{1/8} x 3 x 9 ^{13/16}
ICB-600502	1 ^{7/8} x 4 ^{3/4} x 11
ICB-600503*	2 ^{1/4} x 6 ^{1/4} x 18
ICB-600504*	2 ^{7/8} x 6 ^{1/4} x 18
ICB-600506*	2 ^{1/4} x 6 ^{1/4} x 18
ICB-600507*	2 ^{7/8} x 6 ^{1/4} x 18
ICB-600508*	2 ^{7/8} x 6 ^{1/4} x 32 ^{7/8}
ICB-600509*	2 ^{7/8} x 11 x 17 ^{7/8}
ICB-600510*	2 ^{7/8} x 11 x 19
ICB-600511*	2 ^{7/8} x 11 x 19 ^{1/2}
ICB-600512*	2 ^{7/8} x 13 x 13 ^{3/8}
ICB-600513*	2 ^{7/8} x 13 x 19 ^{3/8}
ICB-600514*	2 ^{7/8} x 11 x 20 ^{3/8}

* Single use element design is standard

ICB ELEMENT UPGRADE CROSS REFERENCE

Hilco P/N	ICB P/N	Hilco P/N	ICB P/N
AT310-00-C	ICB-600501	ST511-00-C	ICB-600502
AT310-00-CV	ICB-600501	ST511-00-CV	ICB-600502
AT310-00-NC	ICB-600501	ST630-00-C	Call
AT511-00-C	ICB-600502	ST718-00-CN	ICB-600504
AT718-00-CN	ICB-600504	ST718-00-CRN	ICB-600503
AT718-00-CRN	ICB-600503	ST718-00-CVN	ICB-600504
AT119-00-03ZXC0	ICB-600511	ST718-00-03ZXC0	ICB-600503
HT310-00-C	ICB-600501	ST119-00-03ZXC0	ICB-600511
HT310-00-CV	ICB-600501	FAC-310	ICB-600501
HT511-00-C	ICB-600502	FAC-511	ICB-600502
HT718-00-03ZXC0	ICB-600503	FAC-00	ICB-600503
HT718-00-CN	ICB-600504	FFC-000	ICB-600502
HT718-00-CRK	ICB-600503	FFC-00	ICB-600503
HT718-00-CRN	ICB-600503	FFC-00-2	ICB-600504
HT718-00-CVN	ICB-600504	FFC-00-10	ICB-600503
HT119-00-03ZXC0	ICB-600511	FFC-000	ICB-600503
HT119-00-03ZAGO	ICB-600511	FFC-1-600	ICB-600511



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