Product Bulletin

Fyrquel® EHC S
Electro-Hydraulic Control Fluid

OVERVIEW

Fyrquel® EHC S is an older second generation t-butylated phenyl and triphenyl phosphate ester self-extinguishing (fire-resistant) electro-hydraulic control fluid product that was originally developed in the 1970s, produced from then best available raw materials and process, containing between 15-25% of triphenyl phosphate (TPP) . It is still supplied but not promoted since ICL's heritage company developed a new technology platform to produce the improved Fyrquel® EHC Plus containing less than 4% triphenyl phosphate. ICL recommends that users of Fyrquel® EHC S fluid consider easily switching to Fyrquel® EHC Plus, the modern 3rd generation phosphate ester fluid, that is produced from newer raw materials and that features a more sustainable product design -- both trixylyl phosphate-free and featuring low triphenyl phosphate (TPP) content, specified less than 4% . The International Standards Organization (ISO) classifies phosphate ester fluids as HFDR class. HFDR phosphate ester class fluids are water-free fluids that are both extremely difficult to ignite and inherently self-extinguishing. Other types of synthetic fluids are not self-extinguishing and are separately classified by ISO as HFDU class. Steam turbine operators should use self-extinguishing HFDR class phosphate ester Fyrquel® fluids to get the highest level of protection from the risk of leaking fluid fires. Visit www.fyrquel.com to review the full range of Fyrquel® product choices and to view a short video that easily shows the self-extinguishing advantage of Fyrquel® phosphate ester fluids.

PRODUCT MIXING

Fyrquel® EHC S is fully mixable and interchangeable with other Fyrquel® EH series products and may be mixed or topped off in the same reservoir.

MAINTENANCE & HANDLING

Fyrquel® EHC S can be maintained in good condition by keeping the fluid dry, away from sources of overheating and by maintaining a low fluid acidity using standard off line chemical filtration. The Fyr-Check® Fluid Analysis service program is available on request along with other service assists from experienced technical representatives. Refer to Safety Data Sheets (SDS) for additional information, storage, handling, and transport guidelines.

TYPICAL PROPERTIES

Appearance	clear, transparent liquid
Viscosity	
at 37.8°C (100°F) cST (SUS)	47 (220)
at 98.9°C (210°F) cST (SUS)	5 (43)
ISO Grade	46
Viscosity Index	0
Specific Gravity @ 60/60° F	1.145
Pour Point , °C (°F)	-18 (0)
Water Content, wt. %	0.10 max
Chlorine Content, ppm (micro coulometry)	20
Acid Number, mg KOH/g	0.04
Foaming, (ASTM D-892-72), mL.	10
Color, ASTM	1.5
Particle Distribution (SAE A-6D, tentative)	ISO 15/12 Class 3
Resistivity (OHM/cm)	20.0 x 10^9 min
Air Entrainment, Minutes,	< 7 minutes

Note that these Typical Properties are not Sales Specifications. Sales specification values are available upon request. Actual values are confirmed by Certificate of Analysis at the time of shipment.

ENGINEERING DESIGN DATA

Evaporation Loss, wt. % (22 hrs @ 300° F)	1.50
Coefficient of Thermal Expansion @ 100° F (Ml/Ml/°F)	0.0003
Surface Tension (dynes/cm) @ 68° F	42
Heat of Combustion (btu/lb)	13,459
Specific Heat (cal/g °C)	
0°C	0.3523
38°C	0.3762
100°C	0.4101
Thermal Conductivity (cal-cm/sec/cm^3/°C)	
40°C	3.04 x 10^{-4}
94 °C	3.04 x 10^{-4}
146 °C	2.95 x 10^{-4}
Latent Heat	24.7 kcal/mole 60.3 cal/g 108.8 BTU/lb.
Vapor Pressure (mm Hg ABS)	
420 °F	0.08 mm Hg ABS
430 °F	0.50 mm Hg ABS
450 °F	1.20 mm Hg ABS

LUBRICITY DATA

Shell 4-Ball Test
- 1 kg. load, Scar dia. mm., avg. 0.19
- 10 kg. load, Scar dia. mm., avg. 0.38
- 40 kg. load, Scar dia. mm., avg. 0.48

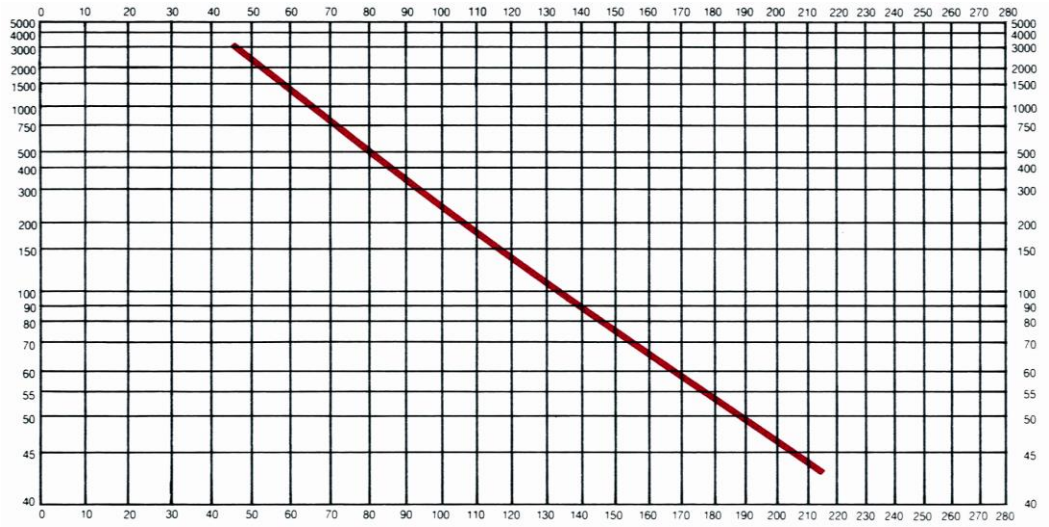
V-104C Vickers Vane Pump Test (ASTM D-2882)

Ring Wear, grs. cumulative	
24 hours	0.0037
100 hours	0.0043
Vane Wear, grs. cumulative	
24 hours	0.0030
100 hours	0.0085
“FALEX” Lubrication Test	(ASTM D-2625)
Wear Test (ASTM-D-2670)	0.0105 scar width, in.
Extreme Pressure Test (ASTM D-2625)	
Transition Load	1,500 lbs.
Transition Pressure	101,000 psi.
“TIMKEN” Lubrication Test	(ASTM D-2714)
Wear Test	1.25 scar width, mm
Extreme Pressure Test	
O.K. Load	55 lbs.
Pressure at O.K. Load	26,250 psi

SAFETY & HANDLING: Consult the Safety Data Sheet for these products.
SHIPPING INFORMATION: 55 gallon/208 liter drums.

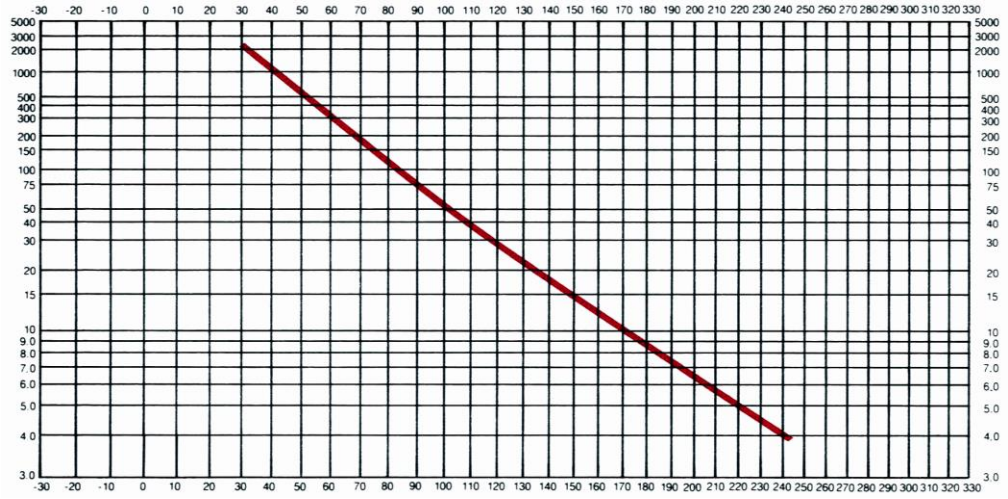
Temperature, Degrees Fahrenheit

Viscosity, Saybolt Universal Seconds



Temperature, Degrees Fahrenheit

Kinematic Viscosity, Centistokes



Visit www.fyrquel.com to review product choices and Fyrquel® contact information.