Product Bulletin

ICL Industrial PRODUCTS

Fyrquel® Electro-Hydraulic Control Fluids

Fyrquel® Power Generation Series

Overview

Fyrquel® Electro-Hydraulic Control Fluids are phosphate ester based fire-resistant fluids formulated with trixylenyl and or butylated phenyl phosphates. The fluids are in the class of "non aqueous hydraulic fluids" sometimes referred to as "synthetic fire resistant fluids". Fyrquel® fluids are both extremely difficult to ignite and inherently self extinguishing. Other type synthetic fluids are not self extinguishing. Critical equipment should use self extinguishing fluids to get the highest level of protection from leaking fluid fires. Please visit www.icl-ip.com and go to the Functional Fluids business unit icon to see a comparison of fire-resistant fluids.

Fyrquel® fluids offer:

- Highest fire resistance
- Inherent self extinguishing property
- High oxidative and thermal stability
- Good hydrolytic stability
- Excellent lubrication properties
- Rated readily biodegradable

Fyrquel® Product Selector

Fyrquel® EHC meets or exceeds GE, Westinghouse, Alstom/ABB, and most other EHC equipment OEMs. Fyrquel® EHC-N meets or exceeds Siemens, Alstom/ABB specifications for a trixylenyl phosphate product with low air release time. Fyrquel® EHC-S has been traditionally recommended for higher temperature service.

Fyrquel® Series

First Generation	Fyrquel® EHC-N	Trixylenyl phosphate (TXP)
Second Generation	Fyrquel® EHC	Trixylenyl phosphate (TXP) and Butylated phenyl phosphates
Second Generation	Fyrquel® EHC-S	Butylated phenyl phosphates (Higher Temperature Service)

Product Mixing

The Fyrquel® products listed in the above box are fully miscible with each other and may be mixed or topped off in the same reservoir. However, when upgrading to a newer generation fluid, we recommend a total fluid change to receive the full benefit of the new fluid. This will also allow cleaning of the reservoir prior to the change. The only two exceptions to this guideline would be mixing a degraded fluid, identified by a >0.20 TAN fluid acidity condition, with new fluid. The first exception is when performing a corrective partial fluid change to a reservoir containing degraded fluid; the same product should be used for the partial re-fill. The second exception is when performing a total fluid change replacing degraded fluid; the system should first be cleaned to remove built-up contamination prior to refilling with the third generation fluids.

Maintenance & Handling

Fyrquel® products are easily maintained in like new, clean condition using standard off line chemical filtration and the FyrCheck Routine Fluid Analysis service available on request, along with other service assists from experienced field representatives. The new generation fluid products feature equal or better stability for continued long service life. Refer to ICL Supresta Material Data Sheets (MSDS) for additional information, storage, handling, and transport guidelines. A review of the MSDS will show Fyrquel® products have similar characteristics as conventional lubricants.

Fyrquel® Electro-Hydraulic Control Fluids

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	0.05
Foaming, (ASTM D-892-72), mL.	10
Color, ASTM	1.5
Particle Distribution	ISO 15/12
(SAE A-6D, tentative)	Class 3
Resistivity (OHM/cm)	12.0×10^{9}
Air Entrainment, Minutes,	<=5 minutes

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	3.04×10^{-4}
94 °C	3.04×10^{-4}
146 °C	2.95×10^{-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

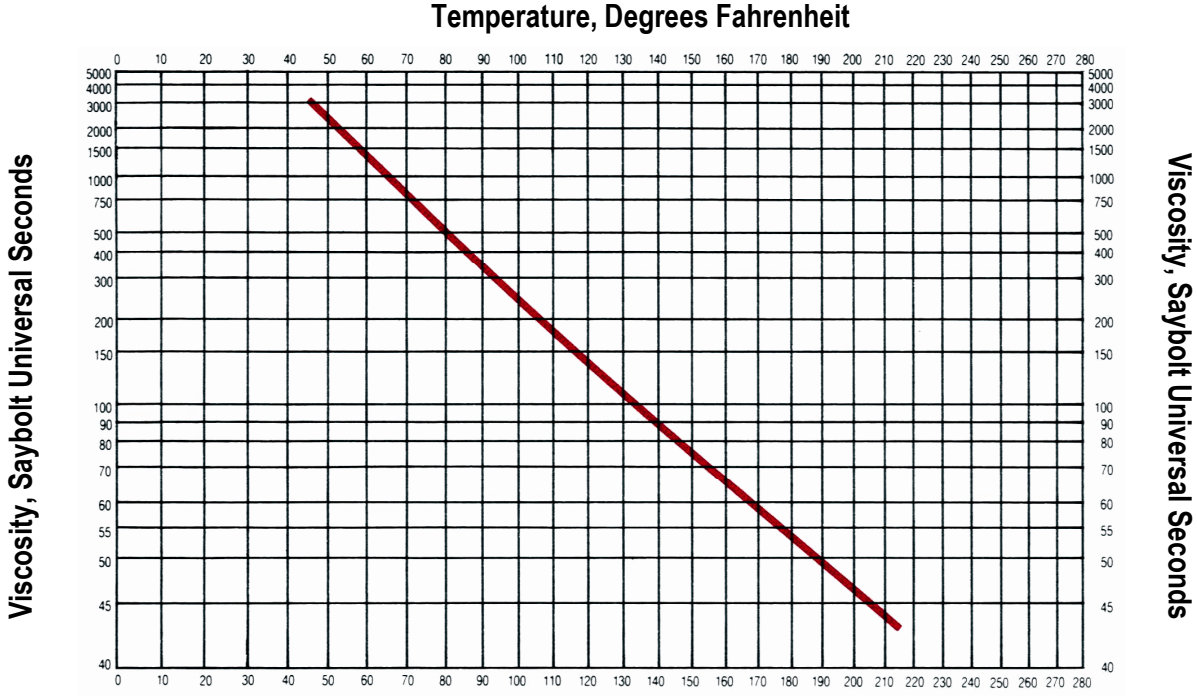
Shell 4-Ball Test	
1 kg, load, Scar dia. mm., avg.	0.19
10 kg load, Scar dia. mm., avg.	0.38
40 kg. load, Scar dia. Mm., avg.	0.48
V-104C Vickers Vane Pump Test (ASTM D-2882)	
Ring Wear, grs. cumulative	
24 hours	0.0037
100 hours	0.0043
Vane Wear, grs. cumulative	
24 hours	0.0030
100 hours	0.0085
"FALEX" 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

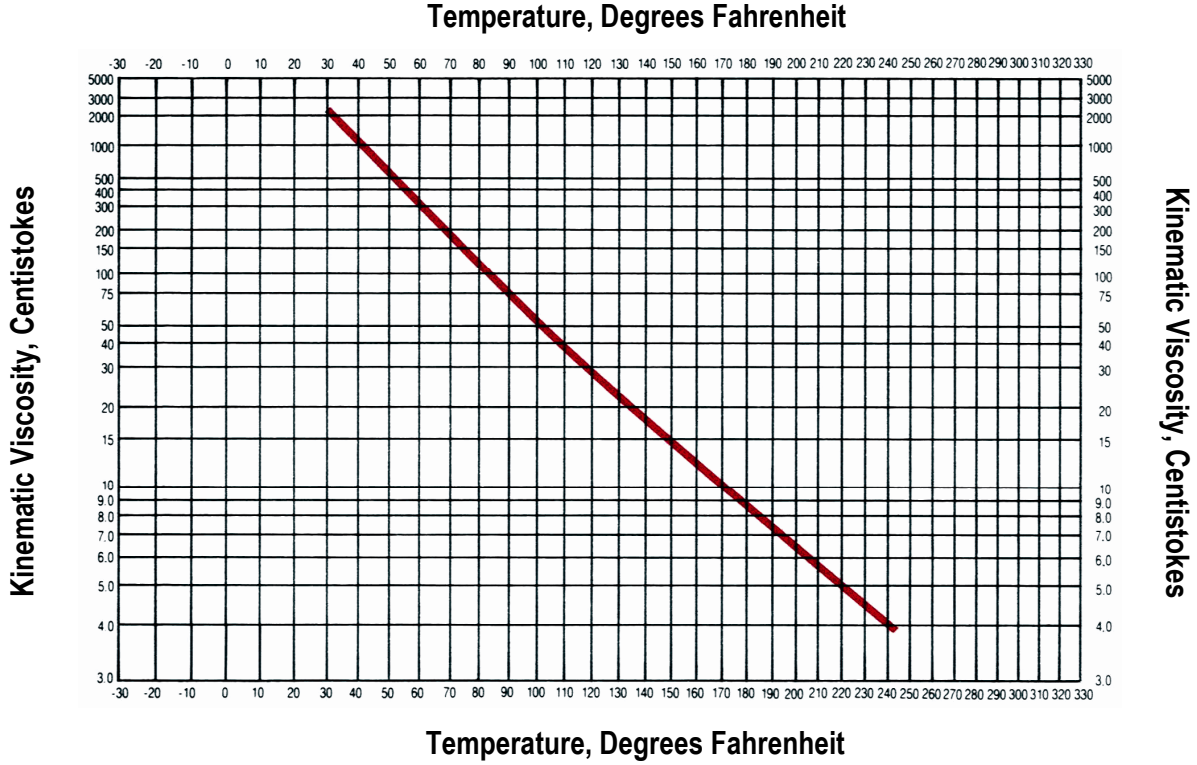
Safety & Handling

Consult the Material Safety Data Sheet for these products.

Shipping Information

Available 55 gallon/208 liter drums.





For more information about our products and to place an order, please contact your nearest ICL regional sales office:

AMERICAS REGIONAL SALES OFFICE
ICL Supresta Inc.
622 Emerson Road, Suite 500
St. Louis, Missouri 63141-6742 USA
Tel: 800-666-1200
Fax: 314-983-7607

ASIA PACIFIC REGIONAL SALES OFFICE
ICL China
93 Huai Hai Zhong Road #905-909
Shanghai 200021, China
Tax: 021-53863336
Fax: 021-53863336

EUROPEAN REGIONAL SALES OFFICE
ICL-IP Europe BV
Fosfaatweg 48 1013 BM Amsterdam
P.O. Box 465 1000 AL Amsterdam, Netherlands
Tel: (31) 20 800 5800
Fax: (31) 20 800 5805