

CHEMOLUBE® H

WATER-GLYCOL FIRE RESISTANT FLUIDS

PRODUCT DESCRIPTION

CHEMOLUBE H fluids are specially formulated, water-glycol based products designed for industrial application. **CHEMOLUBE H** fluids at the suggested water dilution, will retain its high degree of fire resistancy while protecting your system against wear, rusting, corrosion, foaming and freezing. We recommend that the dilution water be distilled or de-ionized or good steam condensate. The use of **CHEMOLUBE H** fluids involves no change in normal equipment, design, or operating procedure.

CHEMOLUBE H is an inhibited glycol solution that has been extensively tested and found to inhibit corrosion for all metals normally used in cooling, barrier seal, and hydraulic systems.

CHEMOLUBE H fluids have excellent low-temperature operating properties and eliminate the need for steam tracing to prevent freezing. **CHEMOLUBE H** eliminates the freezing and plugging troubles caused by water which is usually present in the oil system as a result of condensation or from other causes. **CHEMOLUBE H** is non-irritating to the skin and is relatively non-toxic.

Aside from the normal, thorough cleaning of dirty systems during shut downs or new start-ups, no conversion of equipment or change in procedures is required for the use of **CHEMOLUBE H** fluids. Hytek can assist in the cleaning operation if needed.

Since **CHEMOLUBE H** can be delivered as a concentrate, it is less expensive than other synthetic fire resistant fluids. **CHEMOLUBE H** lasts longer, with much less maintenance, and does not have to be changed out as frequently as regular petroleum based oils, eliminating disposal problems and costs. **CHEMOLUBE H** has been used in systems for over ten years without being changed out, increasing reliability of the equipment and reducing operating costs.

FIRE RESISTANCE

The flash point and the fire point of a fluid are basically measurements of flammability. The flash point is the minimum temperature at which sufficient liquid is vaporized to create a mixture of vapor and air that will burn if ignited. It is thus the temperature at which a flash fire occurs. The fire point is the minimum temperature at which vapor is generated at a rate sufficient to sustain combustion. It is reported as the temperature at which the flame persists for five seconds or more. The hot manifold test is designed to simulate conditions in the vicinity of hot metal surfaces.

As evidenced by the above tests, our **CHEMOLUBE H** fluids exhibit complete fire protection as long as enough water is present. If the water is allowed to boil off by prolonged heating, the fire properties of glycol are obtained.

CHEMOLUBE® H
WATER-GLYCOL FLUIDS
TYPICAL PROPERTIES

	<u>CONCENTRATE</u>	<u>50% CONC. 50% WATER</u>	<u>60% CONC. 40% WATER</u>
Appearance	Light Straw to Amber	Light Straw to Amber	Light Straw to Amber
Specific Gravity 20/20°C	1.119	1.078	1.091
Density lb/gal @ 20°C	9.3	9.0	9.1
Viscosity			
200°F, centistokes	3.3	0.92	1.25
150°F, centistokes	6.2	1.3	2.0
100°F, centistokes	16.0	3.0	
4.0			
50°F, centistokes	64	8.2	12.5
0°F, centistokes		48	80
-20°F, centistokes		160	280
Pour Point °F		Below -40	Below -60
pH (approx.)		9.45	9.45
Percent Water (approx.)	2	50	40
Reserve Alkalinity ml 0.1 N HCl/10 ml sample	19	10	12
Flash Point ,°F (Cleveland Open Cup)	290	None	None
Fire Point °F (Cleveland Open Cup)		No Fire	No Fire
Hot Manifold Test		No Flame	No Flame

The above values are representative of current production. Some are controlled by manufacturing specifications, while others are not. All of them may vary within modest ranges.

APPLICATIONS

HYDRAULIC FLUIDS:

CHEMOLUBE H hydraulic fluids are particularly advantageous where possibilities of fires exist. These fluids are fire resistant and were originally designed specifically for the operation of hydraulic systems. The development was in answer to a serious fire which occurred when a coupling failed and allowed hydraulic oil at 200 PSI pressure to spray on a hot line. With the development of higher pressure systems and the associated close tolerance of high speed pumps, **CHEMOLUBE H SPECIAL** was developed in order to provide improved lubricity and viscosity characteristics. Technical information giving you full details about fire resistant **CHEMOLUBE H SPECIAL** hydraulic fluid can be obtained by contacting our office.

HEAT TRANSFER FLUIDS:

CHEMOLUBE H heat transfer fluids are especially favorable in the low- temperature range offering economy, efficient operation, minimum maintenance and precise temperature control. The addition of 50 - 60% of water to **CHEMOLUBE H** reduces the freezing point which creates an effective coolant for a wide variety of services, providing a superior heat transfer media having marked advantages over mineral oils or synthetic type fire resistant fluids. The **CHEMOLUBE H** fluids have excellent thermal and oxidation stability, plus minimal tendency to sludge, carbonize and foul heat transfer surfaces, and they also have high thermal conductivities.

BARRIER SEAL FLUID:

New federal, state and local regulations to reduce fugitive emissions from equipment in petroleum refineries, chemical plants and natural gas processing plants are continually being required. As a result, the seal manufacturers have developed dual mechanical face seals to control emission from pumped products into the environment and to provide safety back-up sealing. The barrier seal fluid which is circulated through a seal chamber between the dual seals is an effective way to carry away both the frictional heat generated at the seal surfaces and the heat generated by turbulence around the seals.

Extensive seal performance tests conducted by one of the major seal manufacturers resulted in **CHEMOLUBE H** fluid being recommended as a barrier fluid. As a matter of fact, the **CHEMOLUBE H 50** fluid outperformed most of the other fluids tested. This is easy to understand since the increased heat transfer capability of the **CHEMOLUBE H** fluids makes them run cooler than regular petroleum products and other synthetics. Thus based on the measured variables, seal face temperature, the temperature difference between the stationary sealing face and the barrier fluid, as well as the post-test of wear of the seal faces, **CHEMOLUBE H** fluids performed exceptionally well.

FLUID MAINTENANCE

We recommend that the **CHEMOLUBE H** concentrate be diluted with distilled or de-ionized water resulting in a minimum of 50% **CHEMOLUBE H** in water solutions. In areas with cold climates we recommend increasing the **CHEMOLUBE H** concentration to 60%. Impure water containing minerals, salts, etc. will react with the inhibitors in the **CHEMOLUBE H** and form solids. An indication that this is happening is a drop in pH and/or cloudiness in the fluid. The specific gravity, pH and appearance of the **CHEMOLUBE H**/Water solution should be checked routinely. The specific gravity provides a check on the water content in the system which determines the freezing point as follows:

CHEMOLUBE H VOLUME %	<u>CHEMOLUBE H PROPERTIES</u>			
	SP GR @20°C	REFRACTIVE INDEX (BRIX)	FREEZING POINT	
			°F	°C
0	1.000	0	+32	0
10	1.016	8.75	+30	1.1
20	1.034	17.0	+24	-4.4
30	1.047	24.5	+15.8	-9
40	1.064	31.75	+3	-16.1
45	1.072	35.0	-6	-21
50	1.0785	38.25	-16	-26.7
51	1.080	39.0	-18.4	-28
52	1.081	39.5	-21.5	-29.7
53	1.0825	40.0	-25	-31.7
54	1.083	40.5	-28	-33.3
55	1.084	41.0	-31	-35.0
56	1.086	41.5	-35	-37.2
57	1.0875	42.0	-38	-38.9
58	1.089	43.0	-41	-40.5
59	1.090	43.5	-44	-42
60	1.0915	44.0	-47	-44
61	1.0922	44.5	-50.8	-46
62	1.0935	45.0	-54	-47.8
63	1.0943	45.5	-56.2	-49
64	1.0955	46.0	-58	-50
65	1.0965	46.5	-59.8	-51
70	1.101		-51.7	-46.5
80	1.1085		-34.6	-37
90	1.114		-18	-27.8
100	1.1187		+3	-16.1

Distilled or de-ionized water should be added if water content in the system drops below 35%. The water content should not be allowed to remain above 50%, not only because of the possibility of freezing in cold weather, but also to insure that adequate inhibitor content is present in the system to protect your unit.

The appearance of **CHEMOLUBE H** fluids should remain clear and straw to amber in color. During startup of a new unit or after converting your system to **CHEMOLUBE H** from another type fluid, the monitoring should be scheduled more frequently than when normal operation has been established. We recommend a frequent check for the first week of operation, then weekly for one month and finally quarterly checks are adequate.

Because most failure is due to dirty or contaminated fluids caused by particulate contamination, it is very important that a dirty system be properly cleaned before adding **CHEMOLUBE H** fluid. During the initial period of operation, the filters should be checked and cleaned or replaced as required. This is particularly true when using **CHEMOLUBE H** fluids for the first time since the solvency action of **CHEMOLUBE H** will pick up any impurities and keep them in suspension. Of course this will eventually result in an efficient, clean system with a minimum of maintenance.

As a service to our customers, Hytek will test samples of the **CHEMOLUBE H**. We will send you a complete technical service report and make any recommendations we feel are necessary if the fluid does not meet our specifications.

Drums containing **CHEMOLUBE H** fluids should preferably be stored indoors and have been stored for up to five years without showing any deterioration. We have not had any occasion to store this fluid in drums for longer periods than five years, but **CHEMOLUBE H** samples kept in glass appear to have unlimited shelf life.

COMPATIBILITY

CHEMOLUBE H fluids have been inhibited against corrosion of iron, steel, and copper alloys and show excellent corrosion protection both in the liquid and vapor phase. Zinc, cadmium, magnesium, lead and unanodized aluminum should be avoided.

CHEMOLUBE H fluids have less effect than regular oil on the various physical properties such as tensile strength, elongation, hardness, and swelling of elastomeric sealing and packing materials. This is readily understandable, because glycols are not miscible in oils and greases or hydrocarbon polymers, and thus have little tendency to extract or dissolve the various components of gasket materials. **CHEMOLUBE H** fluids are compatible with natural rubber, SBR, neoprene, EPR, nitrile, butyl, viton, etc. Material like cork, leather, and untreated cotton or cellulose which tend to soften, swell, or disintegrate in water should be avoided.

CHEMOLUBE H fluids are completely miscible with water but should not be mixed with other types of fluids such as phosphate esters, petroleum oils or emulsions.

Since the solvent action of **CHEMOLUBE H** fluids will remove most paints, we do not recommend painting the interior of a system or any part coming in touch with the hydraulic fluid. If paints are desired, please consult with the paint manufacturer and our office to ascertain that a compatible paint is being used.

Pipes can be assembled with any good grade of pipe compound. We particularly recommend using teflon ribbon.

PRODUCT SAFETY

Experience in industry with **CHEMOLUBE H** fluids has not shown the existence of health hazards with their use. With the exception of internal consumption, they are fluids of low acute toxicity. Proper precautions should be used in handling the fluids. Contact with eyes and prolonged or repeated skin contact should be avoided. Do not breathe vapors. Remove contaminated clothing and wash skin thoroughly with soap and water immediately following exposure.

Information on health effects and their management, and on any recommended safety procedures, may be found in our Material Safety Data Sheets for **CHEMOLUBE H** products.

CHEMOLUBE H is not regulated by the Department of Transportation, therefore it does not have DOT shipping names, hazard classifications, DOT warning labels or identification numbers.

AVAILABILITY

CHEMOLUBE H fluids are available from Newark, DE in 55 gallon drums and also in bulk.

Our personnel are available to offer assistance in the employment and operation with **CHEMOLUBE H** fluids. For information, technical assistance, and placement of orders, please contact our office.

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