

CHEMOLUBE® H SPECIAL

FIRE RESISTANT HYDRAULIC FLUID

PRODUCT DESCRIPTION

CHEMOLUBE H SPECIAL is a specially formulated, water-glycol based fire resistant hydraulic fluid designed for industrial application. **CHEMOLUBE H SPECIAL** consists of water, glycol, high viscosity water soluble lubricating and thickening agents, plus a special blend of corrosion inhibitors and anti-wear additives.

CHEMOLUBE H hydraulic fluids were originally developed in answer to a serious fire which occurred when a coupling failed and allowed hydraulic oil at high pressure to spray on a hot line.

CHEMOLUBE H SPECIAL has been in use for several years with excellent results in hydraulic systems and has been extensively tested and found to inhibit corrosion for all metals normally used in such systems.

CHEMOLUBE H SPECIAL hydraulic fluid has excellent low-temperature operating properties and eliminates the need for steam tracing to prevent freezing. **CHEMOLUBE H SPECIAL** 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.

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 SPECIAL** hydraulic fluid. Hytek can assist in the cleaning operation if needed.

CHEMOLUBE H SPECIAL 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 SPECIAL** has been used in systems for over ten years without being changed out, increasing reliability of the equipment and reducing operating costs.

CHEMOLUBE H SPECIAL is non-irritating to the skin and is relatively non-toxic.

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 SPECIAL** exhibits 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.

TYPICAL PROPERTIES OF CHEMOLUBE® H SPECIAL

Appearance	Clear Red
Specific Gravity @ 20/20°C	1.087
Density, lb/gal	9.05
Refractive Index, Brix	43
Viscosity	
200°F, centistokes/SUS	11/62
150°F, centistokes/SUS	19/93
100°F, centistokes/SUS	43/200
50°F, centistokes/SUS	120/556
0°F, centistokes/SUS	600/2800
Viscosity Index	210
Pour Point, °F	Below -40
pH (approx.)	9.6
Percent Water (approx.)	44
Reserve Alkalinity (ml 0.1 N HCl/10 ml sample)	13 - 20
Rust Test (ASTMD665)	Pass
ASTM D-2882 Pump Test	Pass
Flash Point ,°F (Cleveland Open Cup)	None
Fire Point, °F (Cleveland Open Cup)	No Fire
Hot Manifold Test	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.

FLUID MAINTENANCE

The viscosity, pH and appearance of **CHEMOLUBE H SPECIAL** should be monitored routinely. The viscosity is directly related to water content. The water content of the system is easiest determined by measuring viscosity as follows:

Viscosity @ 100°F (SUS)	% Water
96 - 100	56
101 - 110	55
111 - 115	54
116 - 120	53
121 - 128	52
129 - 135	51
136 - 145	50
146 - 150	49
151 - 165	48
166 - 175	47
176 - 185	46
186 - 195	45
196 - 205	44
206 - 220	43
221 - 230	42
231 - 245	41
246 - 260	40
261 - 280	39
281 - 295	38
296 - 310	37
311 - 330	36
331 - 350	35
351 - 370	34
371 - 390	33
391 - 410	32
411 - 435	31
436 - 460	30
461 - 485	29
486 - 510	28
511 - 535	27
536 - 570	26
571 - 600	25

If an open system is operated at excessive temperatures (above 150°F) over a period of time, water may be lost through evaporation and the viscosity of

the system will increase. It has been our experience that this is a very rare occurrence. If a substantial amount of water is lost, the fire resistance of the fluid starts to decrease. If the viscosity increases to above 260 SUS at 100°F, distilled or de-ionized water should be added to the unit. Our office should be contacted in order to establish the reason for the water loss and also to determine the amount of water to be added.

Although **CHEMOLUBE H SPECIAL** contains excess vapor phase inhibitors, some can also be lost by accompanying water losses over extended periods or by fluid contamination. We monitor this by reserve alkalinity tests and if necessary, we recommend that a small amount (usually one quart for every 25 gallons of water) of vapor phase inhibitor be added when adding water.

The pH should be kept between 9.2 and 10. If the pH is not within these limits, it is an indication of contamination in the system or loss of vapor phase inhibitor, and our office should be notified immediately.

The appearance of **CHEMOLUBE H SPECIAL** hydraulic fluid should remain clear and bright red in color. During startup of a new unit or after converting your system to **CHEMOLUBE H SPECIAL** 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 failures are 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 SPECIAL** hydraulic 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 SPECIAL** fluid for the first time since the solvency action of **CHEMOLUBE H SPECIAL** 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 SPECIAL**. 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 SPECIAL** hydraulic fluid 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 SPECIAL** samples kept in glass appear to have unlimited shelf life.

COMPATIBILITY

CHEMOLUBE H SPECIAL hydraulic fluid has been inhibited against corrosion of iron, steel, 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 SPECIAL hydraulic fluid has 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 SPECIAL** is compatible with natural rubber, SBR, neoprene, EPR, nitrile, butyl, viton, etc. Materials like cork, leather, and untreated cotton or cellulose which tend to soften, swell, or disintegrate in water should be avoided.

CHEMOLUBE H SPECIAL hydraulic fluid is 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 SPECIAL** hydraulic fluid 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 SPECIAL** has not shown the existence of health hazards with its use. With the exception of internal consumption, it is a fluid 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 Sheet for **CHEMOLUBE H SPECIAL** hydraulic fluid.

CHEMOLUBE H SPECIAL is not regulated by the Department of Transportation. The freight classification is "hydraulic systems fluid", therefore it does not have hazard classifications, DOT warning labels or identification numbers.

PERFORMANCE PROPERTIES

CHEMOLUBE H SPECIAL was made available to satisfy the requirements for higher pressure systems yet take advantage of all the benefits of a fire-resistant water-compatible fluid.

During the initial development period of **CHEMOLUBE H SPECIAL** a Pump Life Test was conducted by Paul Monroe Hydraulics, Inc. using Vickers PVB-RSY-20-C-11 pressure-compensated piston pump at 2000 psi discharge pressure. After the test the pump was disassembled and inspected. There were no visible signs of wear, scoring, or pitting of any of the normal wear surfaces. Measurements of the critical components showed no measurable wear in any of the components. After the test a sample of fluid from the pump case was sent to Spectro-Metrics, Inc. for an analysis of particulate matter level (an indication of wear) in the fluid. This analysis indicated that the wear rates were normal.

CHEMOLUBE H SPECIAL meets the rigid requirements of the ASTM D-2882 pump test.

Increased system performance can be obtained from proper filtration of the **CHEMOLUBE H SPECIAL** hydraulic fluid. If suction strainers are installed, we recommend that they be of a large area, low pressure drop type with no finer than 60 mesh screen. Flooded suction without restriction to the pump is recommended. On the pressure side of the system filters of as low as 5 microns will give good performance. **CHEMOLUBE H SPECIAL** hydraulic fluid should not be filtered through "Fuller's Earth" or other surface active clay elements.

AVAILABILITY

CHEMOLUBE H SPECIAL hydraulic fluid is available from Newark, DE or Houston, TX in 55 gallon drums.

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

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