PRODUCT INFORMATION

A PRODUCT OF AMERICAN CHEMICAL TECHNOLOGIES, INC.

CONVERTING HYDRAULIC SYSTEMS TO *EcoSafe*® FR FLUIDS

Thoroughness and preparation must be prime considerations when changing fluids in a hydraulic system. Sufficient time, thought and care can often mean the difference between successful operation or shutdown. Your American Chemical Technologies' representative is trained and experienced in all aspects of hydraulic system conversion and compatibility.
NOTE: Avoid the use of halogenated solvents in system cleaning.

Changing from Petroleum Oil, or Water-Glycol to EcoSafe®

1) Check the compatibility/solubility between the petroleum oil being replaced and EcoSafe®. Prior experience has shown that anti-wear oil' containing a zinc-based anti-wear additive (ZDTP) that this additive is not soluble in EcoSafe®. Also, if motor oil is being used, they generally contain a viscosity modifier (poly-iso-butylene) that again is not soluble. With adequate planning, this oil can be properly drained/flushed from the system to minimize the precipitate formed.

2) Completely drain and clean the reservoir, while the old fluid is warm. Small amounts of residual oil will not interfere with the performance of EcoSafe® FR fluids, but will reduce their fire resistance. Any residual water-glycol will separate and sink to the bottom of the reservoir. This can be removed from the reservoir by periodically opening the bottom drain. Determine compatibility of coatings inside the reservoir, if one is present.

3) Drain and blow-out piping, tubing, headers, hoses, valve stacks and manifolds with clean dry air.

4) Drain pumps, accumulators, hydraulic motors and cylinders to insure removal of all fluids.

5) Dismantle, wash and clean strainers.

6) Drain & clean filter housings. Determine filter element compatibility with the EcoSafe® FR fluid and replace or clean as necessary. It is recommended to start-up with a coarser filter element as the precipitate formed from the insoluble oil additive(s) will prematurely plug a finer element. The coarser elements should be used for the first 30 days.

7) Thoroughly drain and clean coolers.

8) Close the system and circulate a small amount of EcoSafe® FR fluid at low pressure.

9) Thoroughly drain system (repeating Steps 1-6 above) and refill promptly with new EcoSafe® FR fluid.

10) After system is in operation, inspect carefully for leakage during the next two to three weeks.

11) Any residual anti-wear petroleum oil / diesel engine oil (<1%) is compatible and miscible in EcoSafe® FR fluids and will have no long-term detrimental effect on the hydraulic system. Monitor filter plugging for the first thirty (30) days after conversion, due to additive insolubility with these two fluid types. Residual water-glycol will eventually separate from the EcoSafe® FR fluid and sink to the bottom of the reservoir. This material can be removed by draining it from the bottom valve on the reservoir

CHANGING FROM PHOSPHATE ESTER TYPE FLUIDS TO ECOSAFE®

1) Studies have shown phosphate ester fluids and/or phosphate ester/petroleum oil blends to be completely compatible and miscible in EcoSafe® FR fluids.

2) If a 'Fullers Earth' filter is used on the phosphate ester fluid for the control of the Total Acid Number, it should be valved off and eventually removed from the system. This type of filtration is not necessary, nor recommended, for EcoSafe® FR fluids. Standard depth type filters that carry an 'absolute' rating are recommended.

OPTION #1

Because of the compatibility and miscibility of phosphate ester in EcoSafe®, the system can be 'topped-off' with EcoSafe®. EcoSafe® will become the predominant fluid over time with normal fluid makeup. However, for phosphate ester containing systems, it is recommended that the system be drained and flushed before introducing EcoSafe® FR fluids to avoid future disposal problems (i.e.: contamination by the phosphate ester fluid). This is more expensive than disposing of EcoSafe® which can be waste hauled like any petroleum oil.

OPTION #2

1) Follow procedure outlined in 'Changing from Petroleum Oil, or Water-Glycol to EcoSafe®'; steps #1 up to and including #7.

2) Close system and circulate, at low pressure as recommended by the component supplier, a quantity of light petroleum oil (22-46 cSt @ 40°C, 105-215 SUS @ 100°F), or EcoSafe®, sufficient to cover pump inlet.

3) Repeat steps #1 through #7 for 'Changing from Petroleum Oil, or Water-Glycol to EcoSafe®.

4) Close the system and refill promptly with EcoSafe® FR fluid.

5) After system is in operation, inspect carefully for leakage during the next two to three weeks.

Changing from Polyol Ester type fluids to EcoSafe®

1) Studies have shown that polyol ester fluids contain an anti-mist additive that is not soluble in EcoSafe®. Because of this insolubility, special care and attention should be taken when converting from polyol ester to EcoSafe®.

2) Follow procedure outlined in 'Changing from Petroleum Oil, or Water-Glycol to EcoSafe®'; steps #1 up to and including #7.

3) Close system and circulate, at low pressure as recommended by the component supplier, a quantity of light petroleum oil (22-46 cSt @ 40°C, 105-215 SUS @ 100°F), or EcoSafe®, sufficient to cover pump inlet.

4) Repeat steps #1 through #7 for 'Changing from Petroleum Oil, or Water-Glycol to EcoSafe®'.

5) Close system and circulate, at low pressure as recommended by the component supplier, a quantity of EcoSafe® FR fluid sufficient to cover pump inlet.

6) Repeat steps #1 through #7 for 'Changing from Petroleum Oil, or Water-Glycol to EcoSafe®'.

7) Close the system and refill promptly with the proper viscosity EcoSafe® FR fluid.

8) After system is in operation, inspect carefully for leakage during the next two to three weeks.

9) As with #6 above, at start-up a coarser filter element should be used to reduce initial filter plugging. Any residual polyol ester fluid (<1%) will have no long term detrimental effect on the hydraulic system. Filters should be monitored for the next 30 days for plugging. When element life returns to normal, a finer element can be used.