

**Technical Recommendations**

## Use of Components in Systems

with environmentally friendly hydraulic fluids

### Environmentally friendly hydraulic fluids

At present, three groups of environmentally sound<sup>1</sup> or environmentally compatible<sup>1</sup> hydraulic fluids are used:

- › Native esters (HETG), e.g., rapeseed oil
- › Synthetic esters (HEES), e.g., dicarboxylic acid ester
- › Polyalkylene glycols (HEPG), e.g., polyethylene glycol

### Chemical resistance tests

The chemical resistance of ARGO-HYTOS products is currently tested with typical representatives of the groups native esters (HETG), synthetic esters (HEES) and mineral oils (HL, HLP, HLPV).

### Ventilating Filters, Filling and Ventilating Filters, Accessories for Filters and Tanks

#### *Native esters (vegetable oils)*

The current level of knowledge shows that the above mentioned components can be used in vegetable oils without any problems, provided that the vegetable oils are kept free of water during operation.

If water is allowed to enter, the sealing materials (as well as metal components) may corrode due to hydrolytic<sup>2</sup> separation of the rapeseed oils.

#### *Synthetic esters*

The current level of knowledge shows that the above mentioned components can be used in synthetic esters without any problems.

### Hydraulic Filters

#### *Native esters and synthetic esters*

In fluids of these groups, ARGO-HYTOS filters can be used without any problems. For these components no chemical resistance problems occur in case of no other sealing materials than NBR<sup>3</sup> is specified by the fluid manufacturer and provided that the subsequent recommendations are observed.

#### *Polyalkylene glycols*

If you intend to use the hydraulic filters for fluids of the polyalkylene glycol type (HEPG), it is essential that you first consult ARGO-HYTOS.

### Required Replacement Intervals for ARGO-HYTOS Filter Elements

#### Initial fill of hydraulic systems

Hydraulic components are normally tested with mineral oil. Rapeseed oil-based hydraulic fluids and synthetic esters can both be mixed with mineral oils.

#### *With native esters (vegetable oils)*

- › First filter element change after running-in period, but not later than after 50 operating hours.
- › Second filter element change after 500 operating hours, together with change of hydraulic fluid

Subsequent filter element changes every 1000 operating hours and / or always together with hydraulic fluid change, but at least once a year. The hydraulic fluid should be tested by the supplier / manufacturer in all cases after 1000 operating hours, and thereafter at intervals of 300 operating hours, owing to the risk of hydrolysis<sup>2</sup> if water<sup>4</sup> enters.

#### *With synthetic esters*

- › First filter element change after running-in period, but not later than after 50 operating hours.
- › Second filter element change after 500 operating hours, together with change of hydraulic fluid.

Subsequent filter element changes every 1000 operating hours and/or always together with hydraulic fluid change, but at least once a year.

### Changing the oil type of hydraulic systems to native or synthetic esters

After filling with vegetable oil or synthetic ester for the first time, and using new filter elements, the entire hydraulic system should be flushed. All hydraulic functions should be operated several times to ensure that any residue of used oil is flushed out of the entire system. After this first flushing process, a full oil change should be carried out, whereby the filter elements should also be replaced with new ones.

As both vegetable oils and synthetic esters have good dirt dissolving<sup>5</sup> properties, the

- › first filter element change should be made approx. 10 ... 20 operating hours after changing the oil type.

All subsequent filter element changes should be carried out at the same intervals as for initial fill of hydraulic systems (see above).

<sup>1</sup> The terms "environmentally sound" and "environmentally compatible" should be regarded in relation to mineral oil-based hydraulic oils (fluids). The term "environmentally friendly" should not be used in connection with hydraulic fluids.

<sup>2</sup> Separation into glycerine and fatty acid

<sup>3</sup> In oil hydraulics NBR sealing materials are standard. If in the technical datasheet of the used oil a higher quality sealing material than NBR is recommended, ARGO-HYTOS should be consulted.

<sup>4</sup> e.g. condensation water

<sup>5</sup> Deposits which have built up during operation with mineral oil are loosened