

PANOLIN Conversion Guidelines

We certainly recognize the many different systems and applications for our lubricants, therefore we have provided some basic guidelines for you to consider while converting fluids. PANOLIN also would encourage you to contact the Original Equipment Manufacturer (OEM) in regards to lubricant conversions as well. Based on the fact they would have a clearer idea of capacity, components and a history of converting fluid. In most applications you will be converting from mineral oil to PANOLIN ECL fluids but these guidelines can also apply to other fluids. In the case you are converting an HEPG (PAG) please note additional content in section 6. Please feel free to contact PANOLIN Headquarters in Switzerland or any other subsidiary or PANOLIN Partner to discuss possible lubricant conversions in person.

The Conversion Guidelines are applicable for the following PANOLIN ECL fluids:

PANOLIN HLP SYNTH | PANOLIN HLP SYNTH E | PANOLIN HLP SYNTH E SPEC
PANOLIN MARHYD | PANOLIN POLAR SYNTH

1. Drain

Drain oil from the entire system (tank, cylinder, coolers, tubes and hoses etc.). Warm fluid will be easier to drain and is preferred. Check oil tank for cleanliness specifically at this stage, clean if needed. Cleaning the tank and draining the components will help eliminate contaminants during flushing.

2. Filter

Replace filter cartridges.

Note: The before mentioned fluids will actually have a cleaning effect on your system and loosen deposits produced by other lubricants. This cleaning will start during the flushing process. Therefore please check your filters regularly. PANOLIN does not specify any particular filter material.

3. Flushing

Note: During flushing no air should enter the system or suction inlet of the pumps. Air in the system will prevent a thorough flushing and could create cavitation or could cause further damage to your system.

After draining the tank and system we have found that filling with 30 to 50 % of system capacity should be adequate for flushing. Do not operate system with less than the OEM specified minimum fluid requirements. We also are aware that in some systems it might make more sense to fill the system completely and then push through or drain 30 to 50 % of the fluid. This will entail topping up as you flush. You might also need to drain more fluid or a higher percentage of fluid until your contamination rate is achieved. Once you have determined the appropriate means of flushing and the system has the flushing fluid installed, we recommend operating the system a few times before draining (as is section 1). This will help release contaminants and help get any residual fluid out.

Note: To avoid any negative reactions to your new PANOLIN ECL fluid please use the replacement fluid in the correct viscosity when flushing or one of PANOLIN's flushing fluids (if applicable). Using alternative flushing fluids can jeopardize performance, viscosity and environmental benefits of your new fluid.

4. Filling

After flushing the system is complete fill with the replacement PANOLIN ECL fluid. Make sure the system is adequately filled to OEM specifications. If you need to deaerate the system or perform a system bleed make sure to top up afterwards if needed.

5. Starting/Control

We prefer getting on a regular sampling schedule. Starting with a zero sample directly after the fluid change. This will help us determine if any draining and top up should be done to meet fluid cleanliness. We can calculate contaminants and inform you of how much fluid should be drained and fresh fluid replaced. If you already have a fluid testing program please use the below chart as a guideline for testing. A zero sample or initial sample should still be on file.

Test interval after put into Operation/oil change	Normal conditions	Special conditions (e.g. hydraulic breaker)
1. control after	50 working hours	50 working hours
2. control after	500 working hours	250 working hours
3. control after	1'000 working hours	500 working hours
Following tests each	1'000 working hours at least once a year	500 working hours at least once a year

6. Mixing

Do not mix with other oils along with biodegradable oils (such as HEES, HEPR, HETG or HEPG fluids according to ISO 15'380). For technical reasons the mineral oil residual component (such as HLP or HVLP hydraulic fluids to DIN 51'524) must not exceed 5 % of total filling quantity, and the respective mineral oil must be a known and tested commercial hydraulic fluid suitable for the same application. In case of any doubt, please consult our Technical Service department.

Mixing can negatively affect performance and/or environmental compatibility, and seriously impairs the high quality of PANOLIN ECL fluids in some cases.

According to the ISO 15'380 guideline, readily biodegradable fluids may only be mixed with up to 2 % mineral oil based fluids. Due to the different test procedures used in various laboratories, foreign oil components cannot be compared reliably. For this reason we only regard PANOLIN test laboratory results as binding.

Requirements of manufacturers and Eco Labels

Some manufacturers and Eco Labels set the limit for foreign oil content below 5 %.

Example:

Extract of the basic criteria for award of the Environmental Label «Der Blaue Engel, RAL-UZ 178»

«The hydraulic fluids must meet the technical minimum requirements according to DIN ISO 15380.»

The PANOLIN Conversion Guidelines are subordinated to the hydraulic manufacturer's and Eco Label requirements.

7. Microfiltration

By changing a used machine with maybe several thousand of working hours the high dispersant function of PANOLIN ECL fluids must be observed. (see section 2)

After changing from common mineral oil to PANOLIN ECL fluids mineral oil residues might be dispersed. The system should be filtered by a microfiltration system (observe the following instructions) immediately after oil change to avoid such negative impact on the fluid in use:

- good capacity for dirt
- hold back rate should guarantee the cleanliness class <18/16/13 (ISO 4'406)
- Water (condensate) should be retained in the filter too.

8. Disposal

PANOLIN ECL fluids can be disposed by authorized companies by thermal use or by recycling.

The mixture with big quantities of rape seed oil or unsaturated esters can complicate the disposal. Disposal is subject to national and local laws and regulations.

9. Anything unclear?

If anything is unclear please let us help. These guidelines are a reference outline compiled over many conversions and for guidance and support only.