PANOLIN – Simply the Environmentally Considerate Lubricants you need!

In compliance with EPA Vessel General Permit

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PANOLIN HLP SYNTH
Bio-hydraulic fluid – saturated synthetic ester basis, environment-friendly

- Fully synthetic high-performance hydraulic fluid, zinc-free and environment-friendly, on synthetic ester basis with special additives
- Prevents gumming and deposits of ageing products, even at high temperatures
- Extremely long oil-change interval «lifetime filling»
- Reduces CO₂ emissions
- Far greater reserve capacities than conventional hydraulic oils
- Outstanding high-pressure characteristics
- Excellent cold flow characteristics (extremely low pour point)
- Oxidation-resistant at high temperatures

Application/new filling (follow manufacturer’s instructions)
- For hydraulic systems
- Before changing over to PANOLIN HLP SYNTH, please ask for our filling instructions

Note: PANOLIN HLP SYNTH may loosen any deposits in the hydraulic system.

Environmental compatibility (average values – biological data subject to natural fluctuations)
PANOLIN HLP SYNTH is decomposed by micro-organisms in water and/or soil almost without any residues.
- ASTM D-6046-98a: P_W1, T_W1, T_1
- Biodegradability acc. to OECD 301 B: ≈ 70 %
- CO₂ reduction thanks to longer oil-change intervals
- Eco Labels from: Croatia, Czech Republic, Germany, Italy, Japan, Korea, Sweden
- Water hazard classifications/VwVwS; nwg (ISO VG 15, 22, 32), WGK1 (ISO VG 46, 68, 100)

Specifications
ASTM D 943 (Dry TOST test) > 3’000 h; ASTM D 2070 (modified, 1’680 h); FZG Test A/8.3/90; loading stage 12; ISO 15’380/HEES; ÖNORM C 2’027, Part 5; VDMA 24’568 HEES (synthetic esters insoluble in water);
Vickers 35 VQ–25, V104 C

Approvals
Approved by numerous manufacturers of machinery and components.

PANOLIN HLP SYNTH – Compliance of EPA Vessel General Permit 2013

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Assessment in accordance to requirements of Vessel General Permit 2013

EPA test requirements state, all vessels must use an EAL in all oil to sea interfaces. “Environmentally Acceptable Lubricants” means lubricants that are “biodegradable” and “minimally-toxic” and are “not bioaccumulative” as defined in Appendix A of the Vessel General Permit. PANOLIN has conducted the EPA test requirements for all standards described in the 2013 Vessel General Permit (review above chart for test results).
PANOLIN MARHYD
Bio-hydraulic fluid – saturated synthetic ester basis, environment-friendly

- Fully synthetic, zinc-free rapidly biodegradable high-performance hydraulic fluid
- Based on saturated esters from natural resources combined with special additives
- Low toxicity
- Excellent oxidation stability
- Good corrosion protection, also in saltwater
- Excellent lubrication and viscosity characteristics over a wide temperature range
- Excellent cold flow characteristics [extremely low pour point]
- Good abrasion protection
- Reduces CO₂ emissions

Applications/oil changing (follow manufacturer’s instructions)
- Specifically for hydraulic systems in port installations or on boats and ships
- Harbour, on-board and jib cranes
- Stabilizers, bow thrusters and rudder systems
- Winches and hydraulic pitch adjusters

Note: PANOLIN MARHYD may loosen any deposits in the hydraulic system.

Mixing
DO NOT mix with mineral oil or with other biodegradable oils!

Environmental compatibility (average values – biological data subject to natural fluctuations)
PANOLIN MARHYD is decomposed by micro-organisms in water and/or soil almost without any residues.
- Acute Mysid Test acc. to EPA/821/R:02/012
- Biodegradability acc. to OECD 301 B: > 70 %
- European Eco-label (36114: DE/27/095, 36116: DE/27/097)
- Water hazard classifications/VwWwS; nwg, WGK-1

PANOLIN MARHYD – Compliance of EPA Vessel General Permit 2013

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Assessment in accordance to requirements of Vessel General Permit 2013

EPA test requirements state, all vessels must use an EAL in all oil to sea interfaces. “Environmentally Acceptable Lubricants” means lubricants that are “biodegradable” and “minimally-toxic” and are “not bioaccumulative” as defined in Appendix A of the Vessel General Permit. PANOLIN has conducted the EPA test requirements for all standards described in the 2013 Vessel General Permit (review above chart for test results)
PANOLIN STELLA MARIS
Biodegradable Stern Tube Lubricant

- Fully synthetic
- Ester based technology
- Superior lubricity
- Very polar, protects metal surfaces
- No varnish due to thermo oxidation
- Good hydrolytic stability
- Good corrosion protection

Application (follow manufacturer’s instructions)
- For stern tubes acc. to US EPA requirements for marine lubricants (VGP 12/2013)

Environmental compatibility
In case of an unintended release to the environment due to a leakage, PANOLIN STELLA MARIS will be biodegraded thus having a minimal impact on the environment.
- Readily biodegradable
- Meets minimal toxicity requirements
- Does not contain any emulsifier
- Leads to no sheen or slick

Approvals
- ABS (pending)
- European Eco-Label, category 3 (pending)

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| Toxicity | | | | |
| Algae | IC50 | >100 mg/l | >100 | OECD 201 |
| Daphnia | EC50 | >100 mg/l | >100 | OECD 202 |
| Fish | IC50 | >100 mg/l | >100 | OECD 203 |
| Bioaccumulation | log Kow | <3 or >7 | pass | OECD 107, 117 |

| Visible sheen | Gloss, visual color etc. | - | - | no visual color | 58 FR 12507 |

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PANOLIN EP GEAR SYNTH
Industrial oil – fully synthetic, rapidly biodegradable

- Fully synthetic, biodegradable high-performance oil for industrial gear boxes, roller bearings and slide bearings
- Contains additives against oxidation, corrosion and wear
- Excellent high pressure properties
- Excellent high temperature oxidation stability
- Doesn’t lead to gumming even under high thermal load
- Better adhesion to metal surfaces than mineral-oil based gear oils
- Reduces friction and wear
- Absolutely shear-resistant multigrade gear oil with a wider thermal operating range than mineral oil

Applications (follow manufacturer’s instructions)
- Gear boxes, roller bearings and slide bearings

Environmental compatibility
- In case of any leakage fully decomposed by soil or water micro-organisms, without affecting the environment and practically free of deposits.
- WGK 1, weak water pollutant (according to VwVwS classification)

Notice
Due to its outstanding anti-wear properties, PANOLIN EP GEAR SYNTH reduces micro-wear of surface roughness on friction surfaces in aggregates. For optimal benefit from these outstanding characteristics, a prolonged and smooth running-in procedure is recommended.

Performance level [meets requirements for product approved, but no specific manufacturer approval]
DIN 51517/CLP, FZG Test A 16.6/140 load stage 12

PANOLIN EP GEAR SYNTH – Compliance of EPA Vessel General Permit 2013

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Assessment in accordance to requirements of Vessel General Permit 2013
PANOLIN BIOTRACK E
Environmentally Considerate Lubricant for total loss lubrication

- ECL (Environmentally Considerate Lubricant) based on renewable ester
- Contains additives against wear and corrosion
- Reduces friction
- Good emergency running properties even under thin-film conditions
- Very good adhesion

Application (follow manufacturer’s instructions)
- Drive and conveyor chains
- Wire ropes and cables

Environmental compatibility
PANOLIN BIOTRACK E is decomposed by micro-organisms in water and/or soil almost without any residues.
- Biodegradability acc. to OECD 301 B: ≈ 66 %
- Water hazard classifications/VwWwS; WGK-1

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PANOLIN BIOTRACK E – Compliance of EPA Vessel General Permit 2013

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EPA test requirements state, all vessels must use an EAL in all oil to sea interfaces.
“Environmentally Acceptable Lubricants” means lubricants that are “biodegradable” and “minimally-toxic” and are “not bioaccumulative” as defined in Appendix A of the Vessel General Permit. PANOLIN has conducted the EPA test requirements for all standards described in the 2013 Vessel General Permit (review above chart for test results).
PANOLLN BIOGREASE EP 2
Bio lubricating EP grease – fully synthetic, readily biodegradable

- Synthetic multipurpose grease based on lithium soap
- Rapidly biodegradable
- Good mechanical stability
- High oxidation stability
- Good anti-wear and anti-corrosion behavior
- Good water resistance
- Wide temperature range
- Excellent load-bearing capacity thanks to EP additives

Applications (follow manufacturer’s instructions)
- Where grease pollution of the environment is possible

Performance grade
VKA – Gutlast (OK-load) to DIN 51’350 part 2: > 2’800 N

Norm designation (DIN 51’502)
KPE 2 K–30

Environmental compatibility (average values – biological data subject to natural fluctuations)
PANOLLN BIOGREASE EP 2 is decomposed by microorganisms in water and/or soil almost without any residues.
- Biodegradability acc. to OECD 301 B: > 60 %

PANOLLN BIOGREASE EP 2 – Compliance of EPA Vessel General Permit 2013

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IACS Labels
(International Association of Classification Societies)

International Eco Labels

All Labels correspond to defined PANOLIN Lubricants. For detailed information see Technical Data Sheets.