

PANOLIN[®] +
Swiss Oil Technology

GREENMACHINE[®]

High Performance

Environmentally **C**onsiderate **L**ubricants
for hydropower installations



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Swiss Oil Technology

PANOLIN
Bläsimühle 2 – 6
CH-8322 Madetswil
Switzerland
www.panolin.com

Company profile

- Founded in 1949 by Bernhard Lämmle
- Headquarters in Switzerland
- Inhouse R&D (Research and Development)
- Core competence: high performing ECLs (Environmentally Considerate Lubricants) since 1983
- Worldwide availability through PANOLIN warehouses and distribution network



Bernhard Lämmle
*1910 † 1986

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Market areas: Switzerland and
Principality of Liechtenstein.

All international business.

R&D and production.

We want to standardize high performing ECLs globally to preserve the environment.

Economy



Save money

- Preventative maintenance
- Extended oil change intervals
- Less equipment downtime
- Reduction of life-cycle cost



Technology



Environment



Increase performance

- Advanced technology
- More reliability
- Higher efficiency
- Improved availability

Protect the environment

- Environmentally friendly
- Biodegradable
- Meets global regulations
- CO₂ reduction

Only economically viable, technically mature and environmentally friendly concepts are truly sustainable.

Unsurpassed quality

Lubricants for water turbines, generators and hydraulic steel structures have to meet various demanding requirements. They must function with the utmost reliability for decades, even under the most adverse circumstances.

In this sector, PANOLIN has established a reputation for superior lubricants that are highly regarded by numerous manufacturers.

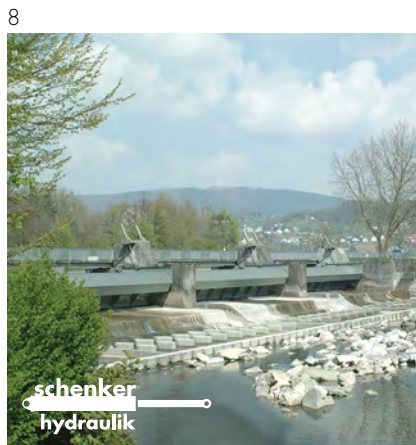
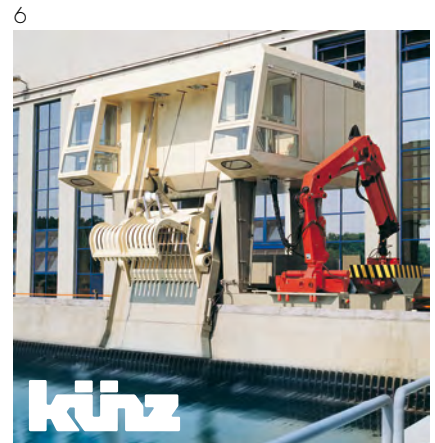
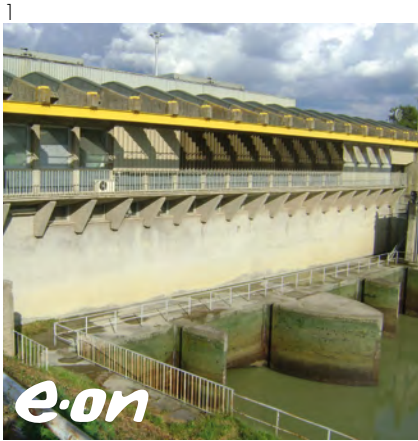
Our oils and greases have been tested and approved by leading manufacturers worldwide. Numerous producers of hydropower machinery and hydraulic steel structures place their trust in our Swiss technology.

They use PANOLIN lubricants as initial filling for their hydraulics systems, generators, water turbines, weirs, sluices, trash rake installations, etc.

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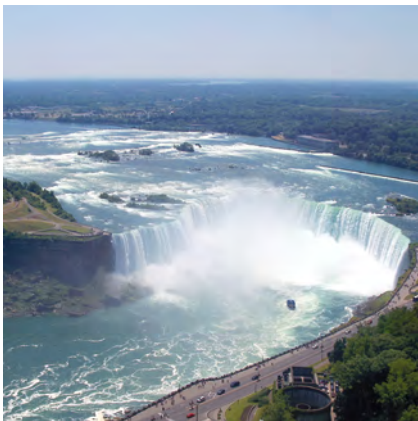
References



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- 1 e-on Alviano Power Plant, Umbria, Italy
- 2 Alstom (Schweiz) AG, CH-5242 Birr
- 3 Bieri Hydraulik, CH-3097 Liebefeld
- 4 Bosch Rexroth AG, D-97814 Lohr am Main
- 5 Föh Maschinen- und Anlagebau, CH-8750 Glarus
- 6 Hans Künz GmbH, A-6971 Hard
- 7 Romag Röhren und Maschinen AG, CH-3186 Düringen
- 8 Schenker Hydraulik AG, CH-4658 Däniken
- 9 Enerpass Konsortial GmbH, St. Martin in Pass, Italy

References



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- 1 Small trash rake installations
- 2 Rhine hydropower plant, D-79618 Rheinfelden
- 3 Hochwuhrr hydropower plant, A-6800 Feldkirch
- 4 Niagara Falls, USA/Canada: Welland Ship Canal with eight locks
- 5 San Roque 345 MW hydropower plant in the Philippines
- 6 Mont Saint-Michel, France: sluice gates in the Couesnon river
- 7 Sae Man Geum, South Korea: the over 30 km long canal with its imposing sluice installations
- 8 Sihwa, South Korea: the world's biggest tidal power plant

Hydraulic oils for hydraulic steel structures and governor systems, and for the hydraulic systems of weirs, sluices, butterfly valves, etc.

PANOLIN HLP SYNTH

- Fully synthetic, high-performance, readily biodegradable, zinc-free and environmentally friendly hydraulic fluid, based on saturated synthetic esters with special additive technology
- Minimally toxic
- CO₂ reduction due to extremely long oil-change intervals «lifetime filling» – enables higher machine efficiency
- Increases availability and reliability of your equipment due to greater power reserves
- Outstanding extreme-pressure characteristics
- Excellent cold flow characteristics (extremely low pour point)
- Prevents gumming and deposits of ageing products even under high thermal load
- Excellent oxidation resistance at high temperatures
- Great dielectric strength



PANOLIN SPRINT

- Fully synthetic, environmentally friendly and readily biodegradable hydraulic fluid
- Based on proven PANOLIN technology
- CO₂ reduction due to extended oil-change and service intervals
- Ester blend with modified, saturated and unsaturated esters
- Minimally toxic
- Outstanding anti-wear and anti-corrosion properties
- Prevents deposits in the hydraulic system
- Excellent cold flow characteristics
- Outstanding extreme-pressure characteristics



PANOLIN HLP SYNTH E

- Fully synthetic, high-performance, readily biodegradable, zinc-free and environmentally friendly hydraulic fluid, based on renewable saturated synthetic esters with special additive technology
- Minimally toxic
- CO₂ reduction due to extremely long oil-change intervals «lifetime filling» – enables higher machine efficiency
- Prevents gumming and deposits of ageing products even under high thermal load
- Excellent cold flow characteristics (extremely low pour point)
- Eco-technically fully mixable and compatible with PANOLIN HLP SYNTH



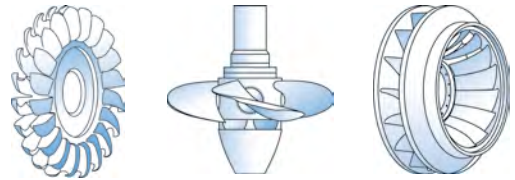
PANOLIN ORCON SYNTH E

- Fully synthetic and readily biodegradable hydraulic fluid, based on renewable saturated synthetic esters developed for the food, pharmaceutical and animal feed industries
- All ingredients fully comply with the strict NSF guidelines (NSF Nonfood Compounds Registration)
- CO₂ reduction due to extended oil-change and service intervals
- Acceptable as a lubricant with incidental food contact according to NSF H1 for use in and around food processing areas
- Mineral oil free
- High polarity that protects metal surfaces
- Excellent oxidation resistance at high temperatures
- Great hydrolytic stability
- No varnish due to thermal oxidation
- Excellent corrosion protection, develops no corrosive components even after extended operations at high temperature



PANOLIN TURWADA SYNTH

- Fully synthetic and readily biodegradable turbine and governor oil, based on saturated esters
- Minimally toxic
- CO₂ reduction due to extended oil-change and service intervals
- Prevents gumming and deposits of ageing products even under high thermal load
- Has a flat viscosity-temperature characteristic for reliable machine operation over a wide temperature range
- Far greater reserve capacities than mineral-based turbine oils
- Outstanding high-pressure characteristics
- Excellent oxidation resistance at high temperatures
- Excellent cold flow characteristics (extremely low pour point)



Cable/chain lubricant

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PANOLIN BIOTRACK E

- Fully synthetic and environmentally friendly cable/chain lubricant, based on renewable synthetic esters
- Minimally toxic
- Excellent oxidation resistance at high temperatures
- Reduces friction
- Very good adhesion



PANOLIN EP GEAR SYNTH

- Fully synthetic, high-performance and readily biodegradable lubricant, based on saturated synthetic esters for industrial gear boxes, roller bearings and slide bearings
- Minimally toxic
- CO₂ reduction due to extended oil-change and service intervals
- Reduces micro-wear of surface roughness on friction surfaces in aggregates
- Outstanding extreme-pressure characteristics
- Excellent oxidation resistance at high temperatures
- Prevents gumming even under high thermal load
- Better adhesion to metal surfaces than mineral-oil based gear oils
- Outstanding anti-wear and anti-corrosion properties
- Extreme shear-resistant multigrade gear oil with a wider thermal operating range than mineral oil



PANOLIN MARGEAR

- Fully synthetic and environmentally friendly gear oil, based on renewable saturated synthetic esters
- Minimally toxic
- CO₂ reduction due to extended oil-change and service intervals
- Reduces micro-wear of surface roughness on friction surfaces in aggregates
- Outstanding extreme-pressure characteristics
- Excellent oxidation resistance at high temperatures
- Prevents gumming even under high thermal load
- Better adhesion to metal surfaces than mineral-oil based gear oils
- Outstanding anti-wear and anti-corrosion properties
- Extreme shear-resistant multigrade gear oil with a wider thermal operating range than mineral oil



PANOLIN MARGREASE W EP 0

- Fully synthetic, readily biodegradable EP fluid grease for automatic injection systems
- Good water wash-out resistance
- Minimally toxic
- Good mechanical stability
- Outstanding anti-wear and anti-corrosion properties
- Wide temperature range



PANOLIN BIOGREASE LL-EP 2

- Fully synthetic, readily biodegradable EP universal lubricating grease for exposed applications based on natural resources
- Minimally toxic
- Good mechanical stability
- Outstanding anti-wear and anti-corrosion properties
- Good water resistance
- Wide temperature range
- Excellent load-bearing capacity due to special additive technology



For additional products please refer to our complete listing

Important note for all products: please follow the manufacturer's instructions



PANOLIN is a statement for

- Advanced Technology
- Environmental Responsibility
- Security



The sustainable PANOLIN concepts

GREENMACHINE®

GREENMARINE®



PANOLIN offers a wide range of high performance biodegradable lubricants for diverse applications. For further information please contact PANOLIN International Inc.

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