

MATROL-BI®

Biodegradable and renewable hydraulic fluids

The partnership with Hydronit, a new opportunity for innovation



About 50% of lubricants and up to 70% of hydraulic fluids end up in the environment, due to malicious or accidental spilling. This "silent" pollution causes long-term damage to waterways, flora and fauna.



Most of the lubricants used in industry are also dangerous for operators (low flash point, high volatility, insalubrious work environment).



It is technically possible to replace traditional mineral oils with new biodegradable and renewable ones in about 90% of applications, significantly reducing environmental pollution and improving work safety.

MATROL-BI HYDRAULIC FLUIDS

- ✓ Biodegradable and high renewable ISO VG 22, 32, 46 and 68 are hydraulic fluids formulated with high refined vegetable oil and/or saturated synthetic esters with remarkable oxidative stability.
- ✓ **MATROL-BI** hydraulic fluids guarantee a high protection of the equipments from corrosion and wear, with excellent de-emulsibility, air release and foaming properties.
- ✓ Suitable for a wide range of applications and for all hydraulic systems, with tailor-made products possibility, specific for each application.
- ✓ Meet ISO 15380 HETG and HEES technical specifications.
- ✓ Low danger for environment and operators.

Hydronit™

Hydronit Smart Hydraulics

Hydronit has always considered innovation as its flagship. In the early XXI century an advanced range of compact hydraulic power units, with consistent flexibility and modularity, was launched and quickly met market success.

In 2016 Hydronit was the first to patent and introduce the Smart Power Unit, with integrated digital controller and IoT capability, for safety related applications. Soon after, extensive tests of an alternative vegetable based hydraulic fluid, Ecolabel **MATROL-BI** ISO VG 46, started.

MATROL-BI

HYDRAULIC FLUIDS

PERFORMANCES

Vegetable-based and ester-based lubricants show advantages during use, due to their chemical nature.

- ✓ **Really high viscosity index (VI):**
viscosity does not change too much with temperature thus allowing less consumption of energy by hydraulic pumps.
- ✓ **Low evaporation loss:**
less need of topping-up and a healthier work environment.
- ✓ **Naturally good tribological properties (Low Coefficient of Friction):**
MATROL-BI hydraulic fluids are made of polar molecules, they are naturally more lubricating, with better protection of mechanical parts from wear. LOW CoF and high lubricity prolong useful lifetime of machine equipment.
- ✓ **High oxidative stability:**
an appropriate choice of bases guarantees a long-lasting use.
- ✓ **High detergency power:**
due to their chemical nature, **MATROL-BI** hydraulic fluids remove deposits from the items of equipment making them cleaner and less prone to wear.
- ✓ **Low flammability:**
traditional mineral oil-based lubricants have a low flash point (Pensky-Mertens) with values around 150 °C, the synthetic ester flash point is around 250 °C while vegetable oils having beyond 280 °C. Therefore vegetable oils and ester-based hydraulic fluids present higher safety against the risk of fire.

SERVICES

- ✓ Assistance during filling/oil change.
- ✓ Assistance via free periodic analysis to monitor the state of hydraulic fluids and thus of equipment.
- ✓ Assistance at end-of-life.
- ✓ Continuous contact with the customer and listening to their needs.

FIELDS OF APPLICATION



Boats and vessels



Tractors and agricultural equipment



Earth moving machines



Municipal vehicles for waste collection



Street sweepers

THE CASE STUDY OF ECOLABEL MATROL-BI HYDRAULIC FLUID ISO VG 46



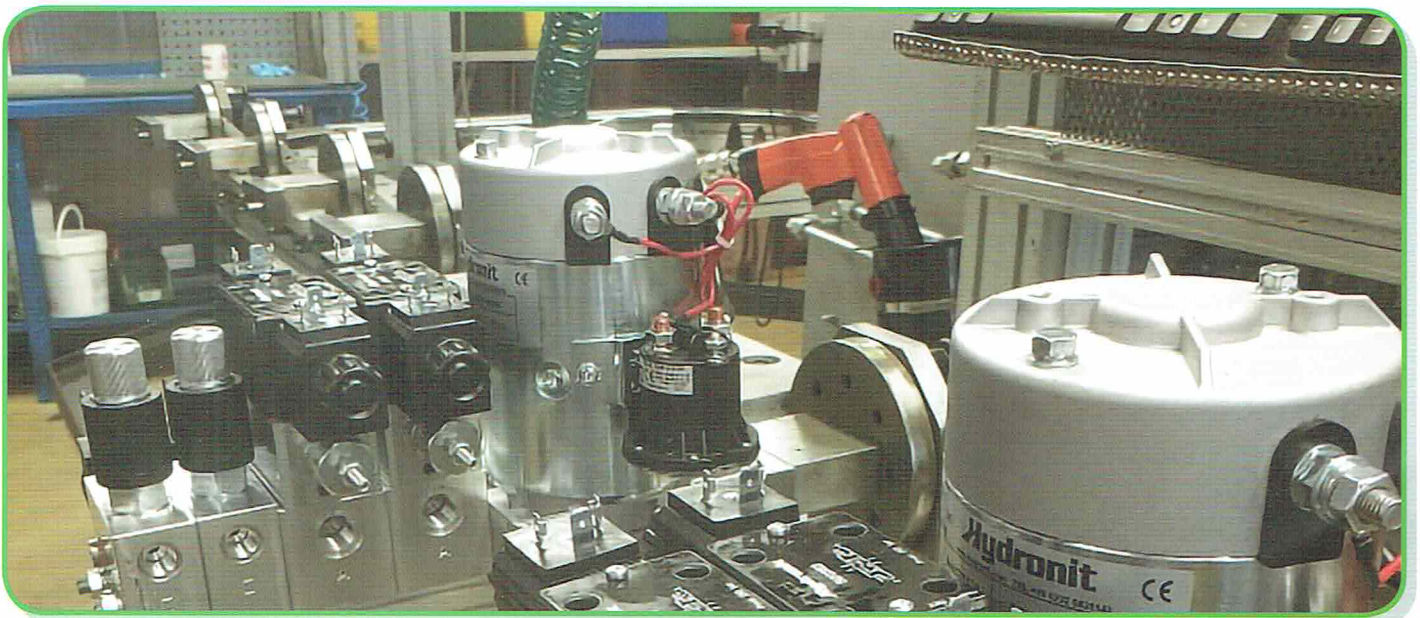
Hydronit designed a series of experiments, by setting up 7 fatigue test benches in order to validate the use of **MATROL-BI** ISO VG 46 Ecolabel hydraulic fluid.

MATROL-BI has been the first hydraulic fluid to obtain Ecolabel in Italy with number of licence IT/027/001.

With the support of periodic chemical analysis on the hydraulic fluid used and the monitoring of operating conditions of the test benches, Hydronit assessed the technical feasibility of substituting a traditional mineral hydraulic fluid with **MATROL-BI** hydraulic fluid.

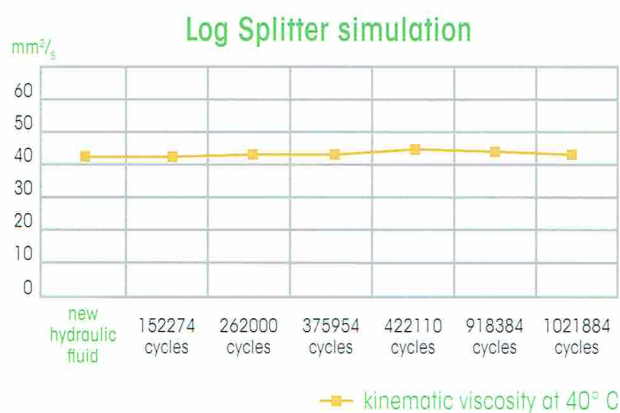
HYDRONIT TRIALS

- ✓ **Typical applications simulated:** plough, log splitter, low plough, elevators, motorcycle lifters and many others
- ✓ **Duration of experiments:** 1 year
- ✓ **Number of test benches:** 7
- ✓ **Several stress tests** on test bench with Hydronit components
- ✓ **Extremely stressful conditions:** 1 million working cycles in some tests
- ✓ **Successful results:** **MATROL-BI** hydraulic fluid is compatible with Hydronit components and protects them from wear during use.

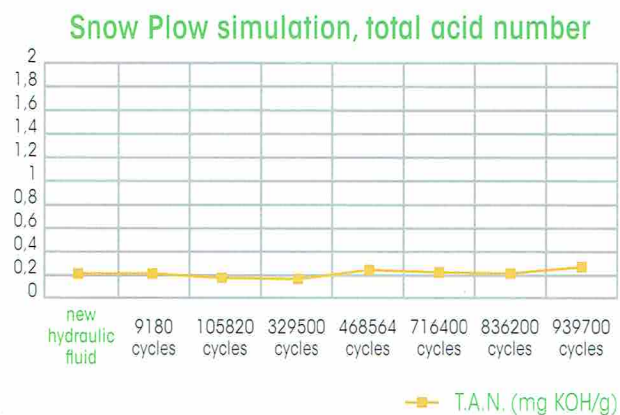


HYDRONIT TRIALS ON ECOLABEL MATROL-BI HYDRAULIC FLUID ISO VG 46: THE RESULTS

The cinematic viscosity does not change after nearly a million cycles, stressful temperature and pressure cycles, which means simulated use of several years.



Acidity does not change, indicating no variation in the chemical structure of the product.



Contaminating metal content due to wear:

ASTM D6595 WEAR (ppm)

Iron	<1
Chromium	<1
Nickel	<1
Manganese	<1
Aluminium	<1
Lead	<1
Copper	<1
Tin	<1
Silver	<1
Titanium	<1

No wear metals after a million cycles were detected: **MATROL-BI** hydraulic fluid protects the system from wear.

Furthermore, has been detected with successful results:

- ✓ Change in the content of additives over time (ASTM D6595)
- ✓ Particulate content from external pollution (ASTM 7596-10)
- ✓ Monitoring of performance of test bechs (temperature, power transmission, pressure, etc)

For more technical and commercial information, contact: Hydronit Srl

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MATROL-BI is a **NOVAMONT** product