LUBRICANTS.
TECHNOLOGY.
PEOPLE.

FUCHS

HydraWay HVXA

High Performance Hydraulic Fluids

Contents

Introduction

The oil reservoir capacity in modern machines has been reduced. More power is transferred by less oil and the hydraulic oil has to operate at higher temperatures, which causes faster oxidation. This leads to pumps applying greater thermal stress to the oil used in order to keep the hydraulic system operating efficiently.

To deliver a high standard of performance, some of the properties and characteristics must be considered when selecting a satisfactory hydraulic fluid. In the following paragraphs we will present the important properties off exceptional hydraulic fluids, HydraWay HVXA, which meet the most challenging requirements.

Advantages and benefits

HydraWay HVXA are Zn-free, high- performance, semisynthetic hydraulic fluids with a high viscosity index, compliant with ISO 6743/4-L-HV and DIN 51524/3- HVLP specifications, which have far superior characteristics and parameters than other conventional hydraulic fluids. HydraWay HVXA have advantages which have proved themselves to more than 600 customers in sectors such as mining, construction, agriculture, transport, oil and gas, manufacturing and marine.

HydraWay HVXA hydraulic fluids:

- Prolong the life of hydraulic components even in very severe conditions thanks to its exceptional anti-wear properties and very good corrosion protection.
- Avoid sludge and varnish formation in hydraulic systems, thanks to a particulary efficient combination of base oils and additive properties.
- Extend service life and stable operation over time thanks to extremely good oxidation and thermal stability and foaming resistance.
- Extend the operating temperature range, low and high, due to a very high viscosity index and better fluidity at low temperatures
- Maximize energy efficiency throughout operation as a result of their high viscosity index and shear stability.
- Reduce pressure loss in the system and prevent cavitation and micro dieseling even if the oil tank is small due to effective air release.
- Improve operating conditions and oil cleanliness thanks to very good filterability and demulsibility.
- Are a more friendly and safe choice for the environment due to modern, low-toxicity features and Zn-free ashless technology.

Application

HydraWay HVXA oils are formulated for use in demanding hydraulic systems and at a very wide range of temperatures. The oils work very well in cold Scandinavian winter conditions and warm European summer conditions.

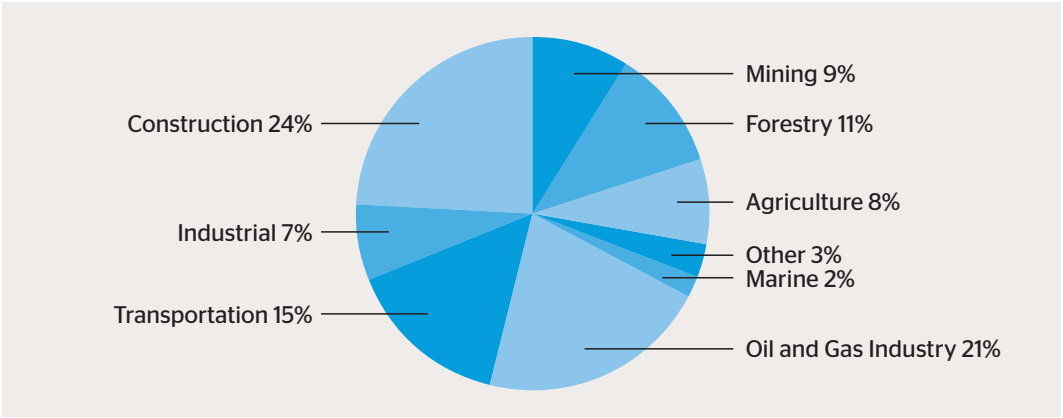
The products are suitable for use in a broad variety of mobile applications:

- Mining and construction: bulldozers, excavators, loaders, graders, drilling machines etc.
- Forestry and agriculture: harvesters, tractors, skidders, feller bunchers.
- Transportation: haul trucks, dump trucks etc.

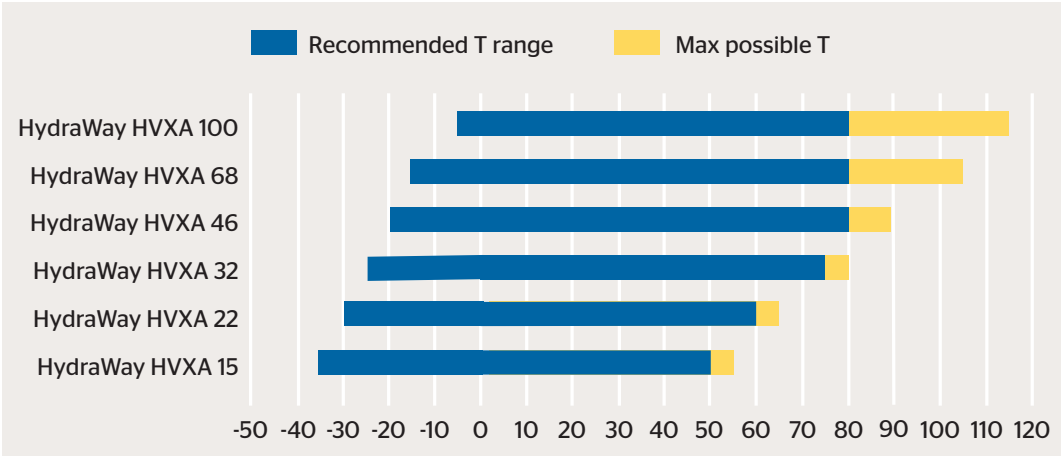
Hydraway HVXA are applicable in industrial hydraulic systems and among others, Computer Numerically Controlled (CNC) machines where servo-valves are used.

The HydraWay HVXA series can be used in a very wide operating temperature range from -35 °C up to + 80°C and is able to operate efficiently at higher temperatures if they are temporary.

HydraWay HVXA main application areas.



Recommended operating temperature ranges (°C) for HydraWay HVXA hydraulic fluids.



Properties and characteristics

Advantages of Zn-free technology

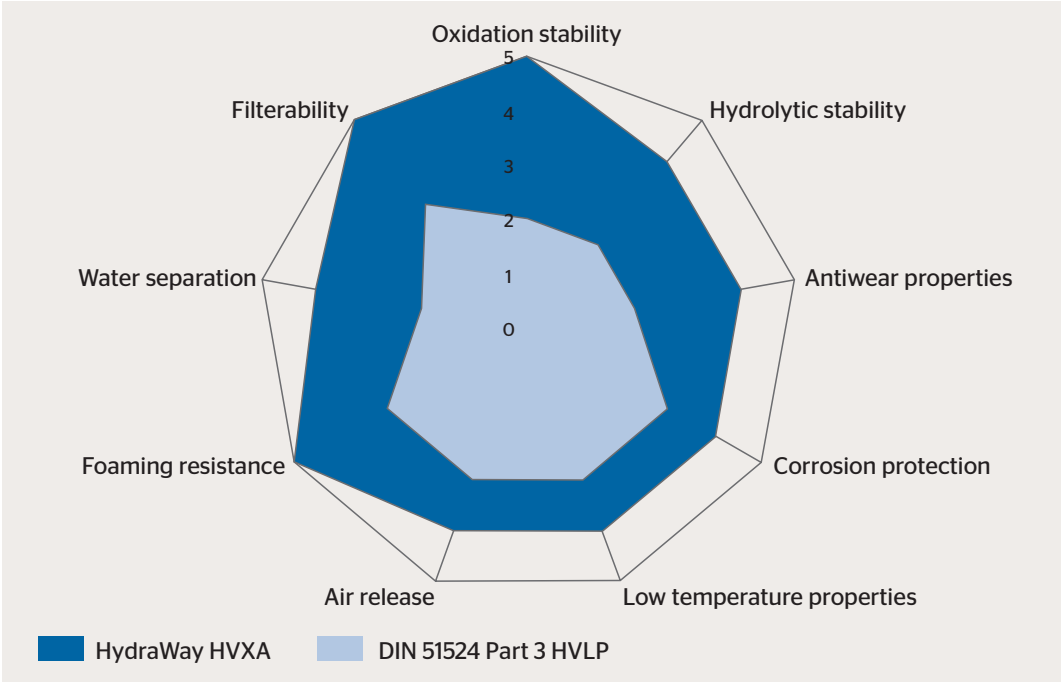
Zinc-free hydraulic technology today replaces older zinc-based which was used in recent decades as a low-price anti-wear antioxidant and anticorrosion agent. A number of OEMs now recommend avoiding zinc-based lubricants due to their disadvantages and harmful effect on the environment, which make such hydraulic fluids insufficient in modern applications. The new generation of Zn-free hydraulic oils have superior properties in comparison with older Zn-containing oils:

- Up to twice longer service life due to better oxidation stability and improved durability.
- Effective wear protection with around 5% better performance than ordinary Zn-based fluids.
- Not aggressive to yellow metals and alloys which are used in parts of hydraulic pumps.
- Reduce insoluble sludge creation by approx. 90% via their better high temperature stability.
- Significantly more environmentally friendly, both for people and the environment, due to an absence of poisonous, and toxic for aquatic ecosystems zinc.

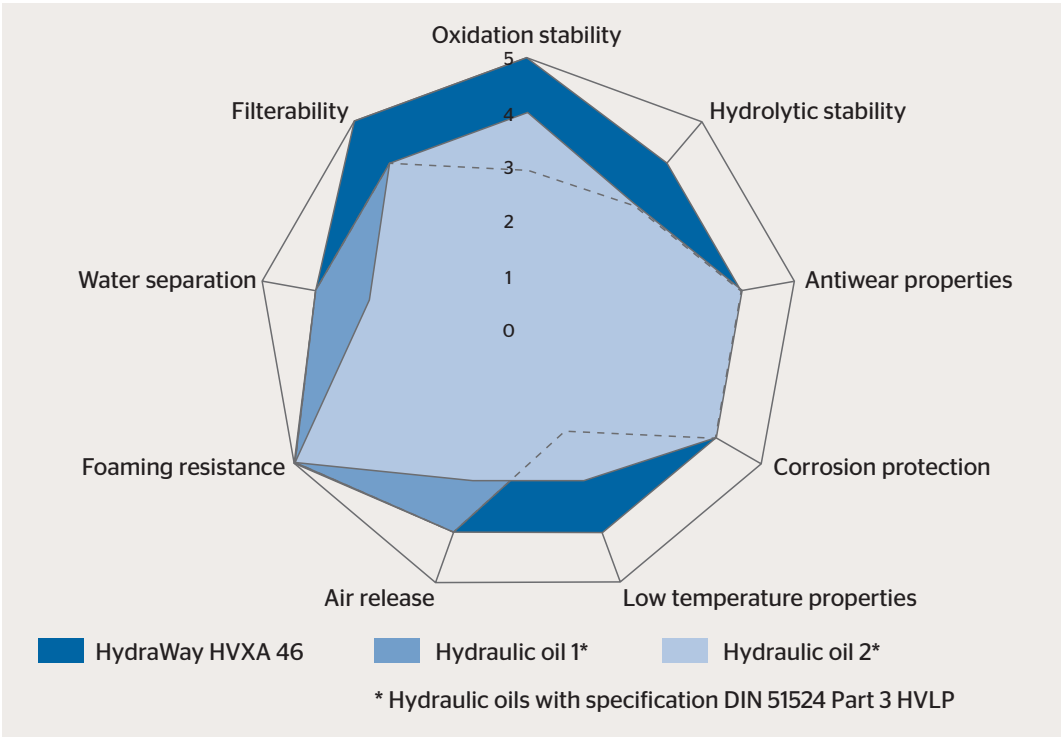
These properties make Zn-free HydraWay HVXA preferable in all the most demanding modern hydraulic systems including compact hydraulic systems with high pressure pumps and higher working temperatures.

Main properties in comparison with standards and other products

HydraWay HVXA performance chart against standard DIN 51524 Part 3 HVLP.



HydraWay HVXA performance chart against other products with the same specification.



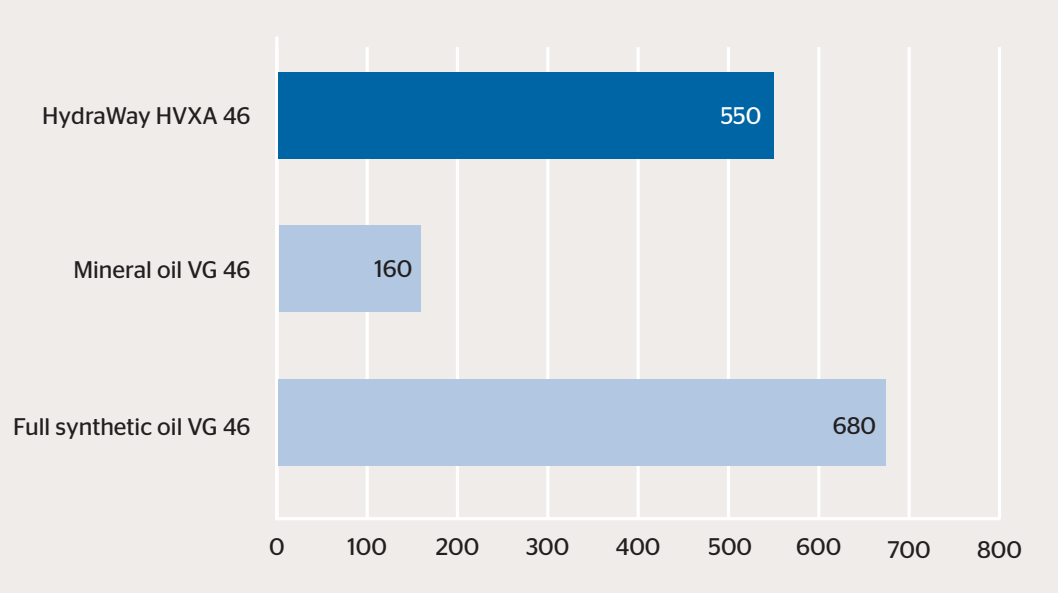
HydraWay HVXA hydraulic fluids are superior in all parameters according to standard DIN 51524 Part 3 and have much better oxidation and hydrolytic stability, low temperature properties and filterability in comparison with competing products on the market.

Oxidation stability

The HydraWay HVXA hydraulic fluid range has outstanding oxidation stability as a result of a combination of a semisynthetic oil base with an advanced technology zinc-free additives.

The oxidation stability of the hydraulic fluid determines service life, resistance to deposits of varnish and sludge creation processes and viscosity changes. Using more oxidation-stable HydraWay HVXA helps to counteract high temperatures, pressure and the influence of contaminant. This also prevents the formation of acids that increase corrosion or insoluble solids that harm the system.

HydraWay HVXA 46 oxidation stability in comparison with mineral and full synthetic hydraulic fluids (RPVOT, min).



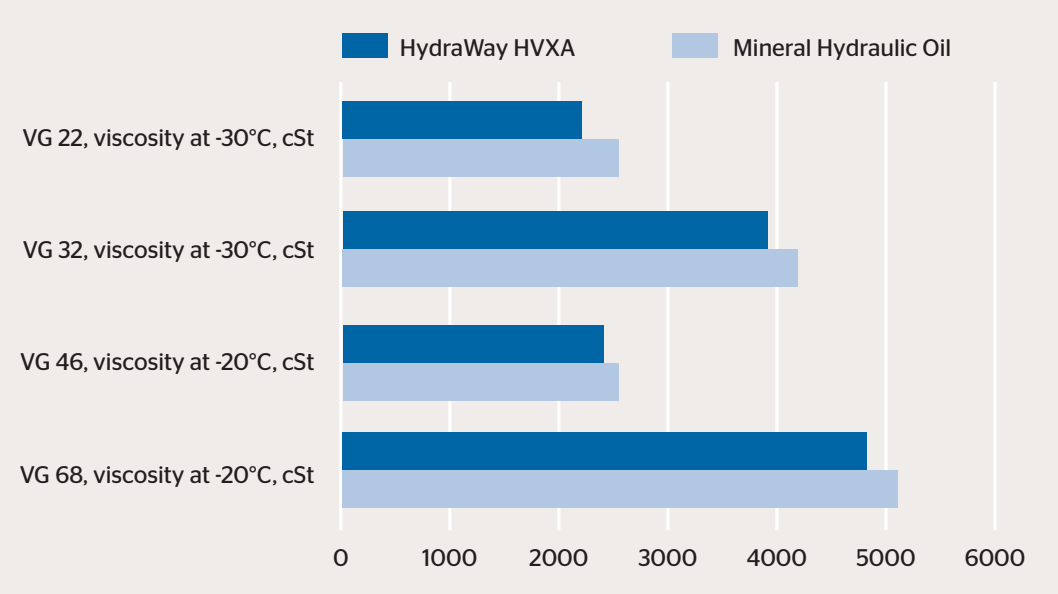
HydraWay HVXA 46 has oxidation stability 3 times higher than ordinary mineral hydraulic fluids and slightly lower than high priced full synthetic hydraulic fluids.

Low temperature properties

Hydraulic oil fluidity at low temperatures is a benefit which is important for use in mobile applications during the winter when equipment stands outside for a long time. Lower viscosity in such conditions allows the lubricant to flow and lubricate the hydraulic system's parts to start the system up and helps avoid wear, cavitation, noise and even pump breakage at the start of work.

The low temperature viscosity of HydraWay HVXA series hydraulic fluids is much better than mineral hydraulic oils classified as DIN 51524 part 3 HVLP.

HydraWay HVXA 46 low temperature viscosity in comparison with an other mineral hydraulic oil, VG 46 DIN 51524/3-HVLP.



HydraWay HVXA series hydraulic fluids can be used in much colder conditions than the same viscosity grade from competitors.

Antiwear properties

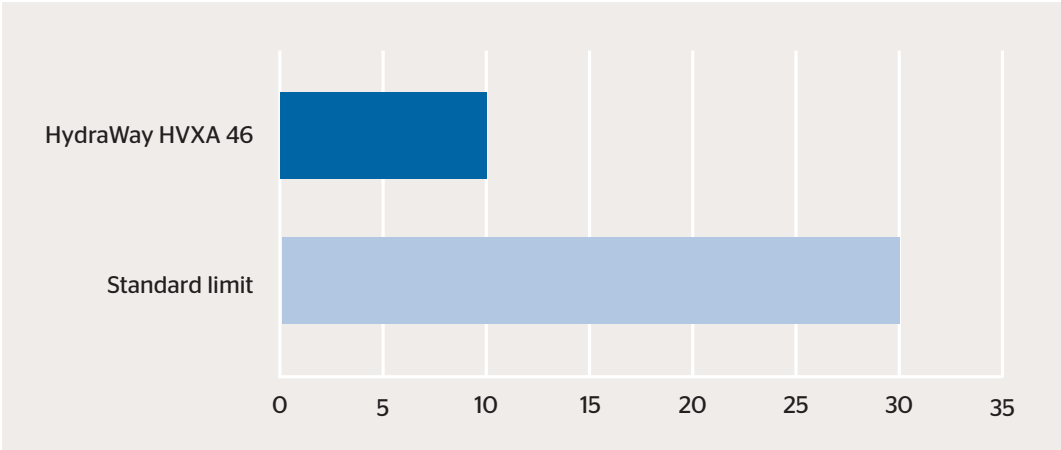
The anti-wear characteristics of the HydraWay HVXA series outperform the number of specification limits. The very good anti-wear properties of HydraWay HVXA series results in longer pump and component life, reduce the number of breakdowns and downtime and save maintenance costs.

Demulsibility

Demulsibility characterizes the ability of oil to separate water from oil and resist formation of emulsions. Oil is hygroscopic and absorbs water from outside. Emulsified water is considered very destructive and affects both fluid and equipment durability. The emulsified water flows with oil through the system and causes increased valves, servos, and pumps failures through wearing, rust and corrosion, poor lubrication and cavitation. Water affects the lubricating oil as well: accelerated oxidation and decreased oil life, may cause some additives deactivation and depletion.

It is very important for hydraulic oil to separate water as fast as possible. It is especially crucial for modern equipment with smaller hydraulic systems, where hydraulic fluid spends very short time in the reservoir and must have a higher level of demulsibility.

HydraWay HVXA 46 demulsibility against DIN 51524 part 3, ISO 11158 HV (min).

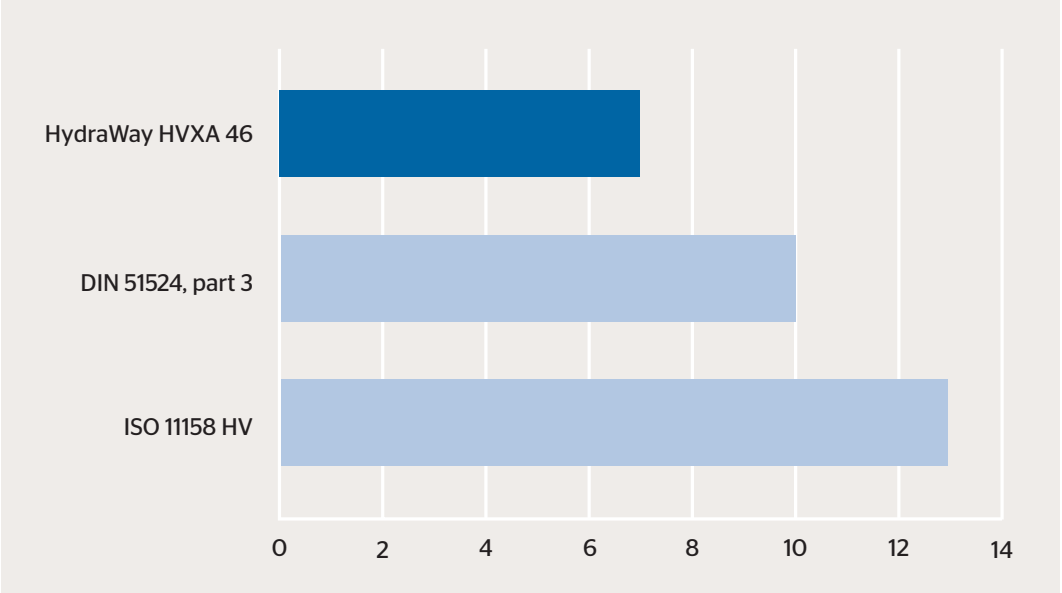


The HydraWay HVXA series has very efficient demulsibility which is 3 times better than standard DIN 51524 part 3, ISO 11158 HV requirements, which makes it ideal for application in mobile equipments that are used outside.

Air Release

The ability to release air is an essential characteristic as it impacts the service life of the system and hydraulic oil life.

HydraWay HVXA 46 air release properties against standards. Air release at 50°C (min).



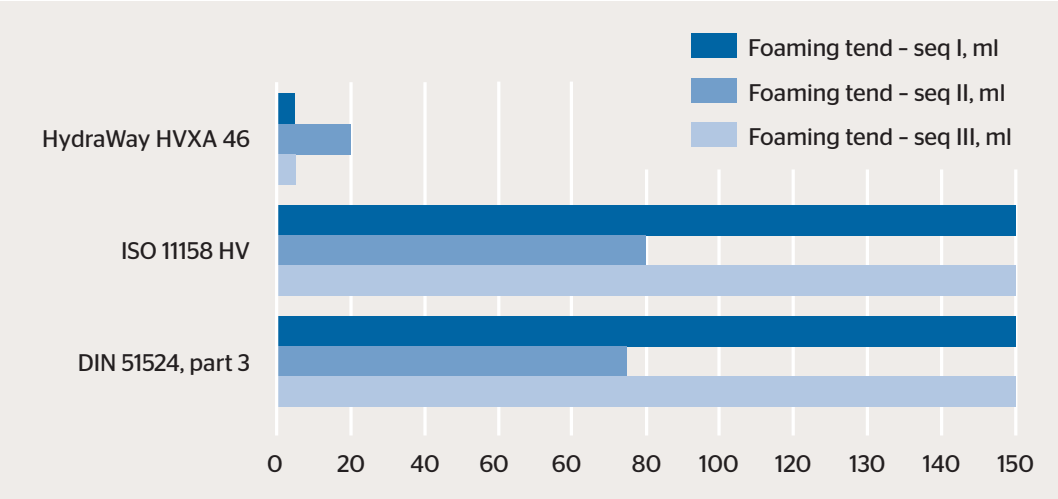
The superior air release value of the HydraWay HVXA series makes the hydraulic system function more reliable and precisely. It helps obtain up to 25% better efficiency in preventing bulk modulus changes, cavitation and aeration, degradation of lubrication, noise generation, than it is expected from ordinary hydraulic fluids which meet DIN 51524 part 3 and ISO 11158 HV requirements.

Foaming resistance

Exceptional foaming resistance properties give the HydraWay HVXA series hydraulic fluids a really big advantage in preventing foaming and its effects: excessive oxidation, cavitation, reduction of lubricating properties of the oil and hydraulic system failures.

The results of foaming tests have revealed that HydraWay HVXA hydraulic fluids have a significantly lower foaming tendency than stipulated by the standards'.

Foaming tendency HydraWay HVXA in comparison with standards requirements (ASTM D 892).



Filterability

The filterability of hydraulic fluids evaluates their tendency to cause filter plugging and describes the ability of a hydraulic fluid to pass through a filter, removing solid contaminants.

HydraWay HVXA oils are characterised by an extremely good level of filterability. HydraWay HVXA 46 has 99% level-I-filterability and 97% level-II-filterability according to the ISO 13357-2 method. This significantly exceeds standard requirements and makes it possible to use the most fine filters for effective cleaning of the hydraulic system, even if the filters are finer than 5 microns.

Rust and corrosion inhibition

Rust is the result of water reaction with ferrous metals. Corrosion is a chemical reaction between aggressive chemical compounds, mainly acids, and metals. Hydraulic fluid has to prevent the above mentioned destructive processes from occuring in the system, which are inhibited by contaminants and higher temperatures. Rust and corrosion inhibition properties tested with Hydraway HVXA series fluids confirmed the efficient steel parts protection in both fresh and sea water.

Pump elements made of copper alloys are susceptible to attack by the products of fluid degradation like zinc-based additives and sulphur compounds. The level of HydraWay HVXA products corrosiveness is revealed from the tests as 1b, that is better which is required by standards DIN 51524 Part 3 HVLP and ISO 11158 HV.

HydraWay HVXA oils contain special inhibitors which create protective film on metal surfaces and efficiently withstand rust and corrosion processes.

Technical Data HydraWay HVXA 46

Characteristics	Method	Unit	Typical value
Density at 15°C	ISO 12185	kg/m³	869
Acid number, potentiometric	ISO 6619	mg KOH/g	0.15
Air release at 50°C	ISO 9120	min	7
Copper corrosion (3h, 100°C)	ISO 2160	rating	1b
Demulsibility	ASTM D 1401	min	10
Filterability, dry, Stage I/II	ISO 13357-2	%	99/97
Flash point COC	ISO 2592	°C	200
Foaming tend/stab - seq I	ASTM D 892	ml	5/0
Foaming tend/stab - seq II	ASTM D 892	ml	20/0
Foaming tend/stab - seq III	ASTM D 892	ml	5/0
FZG A/8.3/90	CEC-L-07-A-95	FLS	12
Pour point	ISO 3016	°C	-48
Rust prevention "B"	ASTM D 665 B	rating	Pass
Shear stability, (KV 100 after shear)	CEC-L-14-A-93	mm²/s	>6.04
Viscosity at 40°C	ISO 3104	mm² / s	45,0
Viscosity at 100°C	ISO 3104	mm² / s	8.1
Viscosity index	ISO 2909		155
Viscosity at -20 °C	ISO 3104	mm² / s	2400
4-ball, MSD 40 kg	ISO 20623	mm	0,57
Oxidation stability, PRVOT	ASTM D 2272	min	550
Hydrolytic stability, Acid no increase, 120h/192h	SS-155181	mgKOH/g	0/0

Available packaging: 20L, 208L, 1000L.

For the latest specifications and more detailed information, see Product Data Sheets at www.fuchs.com/se/en

fuchs.com/se/en

FUCHS LUBRICANTS SWEDEN AB
Torkel Knutssonsgatan 24
118 88 Stockholm
Vxl: 08-128 25 000

Kundservice
Tel: 0775-59 59 59
order@fuchs-oil.com
fuchs.com/se

Technical Advantages HydraWay HVXA /Art 58 2016-10