

# ENVOLUBRIC HE 46

HFD-U hydraulic fluid with a high flash point



**ENVOLUBRIC HE 46** is based on synthetic esters which is FM approved to Class Number 6930, April 2009 and shows a very good chemical resistance in high-performance hydraulic systems.

Due to its nature **ENVOLUBRIC HE 46** has extremely good viscosity/temperature properties, a high thermal stability and superior anti-wear properties due to its excellent lubricity.

Additionally, due to the incorporated additive system, very good oxidative as well as hydrolytic stability is achieved. Good corrosion protection is of course also ensured.

**ENVOLUBRIC HE 46** shows multiple advantages especially when being applied at high temperatures in a hydraulic system. Also in regard to safety it proves to be an excellent choice due to its high boiling temperature, its high flash and fire point as well as its high auto-ignition temperature. Thereby it offers a significantly higher level of safety than common hydraulic oils.

Due to its basic fluid, it is to a high excellent easily bio-degradable. It is not water-soluble and does not contaminate water because it can be skimmed off or separated relatively easily as it has a low specific gravity.

We would like to point out that in spite of all its positive properties, the fire-resistance of **ENVOLUBRIC HE 46** (as of all polyolester products (HFD-U)) cannot be compared to that of our water/glycol fluid ULTRA SAFE 620.

## FM Approval, Class Number 6930, April 2009

- FM approval means that the product has been independently tested, and that our manufacturing facility has been audited by Fm Global. This provides assurance that the product will consistently provide excellent fire resistance. FM Approval can often bring a reduction in insurance premiums. A greater fire protection will be achieved with a high fire point; **ENVOLUBRIC HE 46** provides excellent fire suppression characteristics thereby creating a safer working environment and greater equipment protection. Report available on request.

**Only valid in combination with EC-Safety-Data-Sheet.**

*The information given here is considered to be correct and is offered for your consideration, investigation and verification. No warranties are expressed or implied since the use of our products is beyond our control. Statements concerning the use of PETROFER products are not to be construed as recommending the infringement of any patent.*

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## Physical Data

Appearance	Amber, Clear	
Density, at 20°C	0,900-0,925 g/cm <sup>3</sup>	DIN 51757
Viscosity, at 20°C	92-125 mm <sup>2</sup> /s (cSt)	DIN 51562
at 40°C	42-52 mm <sup>2</sup> /s (cSt)	DIN 51562
Viscosity Index	185-205	DIN 51564
Flash Point	280-310°C	DIN 51794
Fire Point	335-365°C	DIN 51794
Pour Point	(-33) – (-43)°C	ASTM D 97
Auto Ignition Temperature	min.430°C	DIN 51794
Acid Number	1,0-2,0 mgKOH/g	ASTM D 664
Ash Content	max.0.01%	DIN 51575
Air separation	5 min.	ASTM D 3427
Foam Test	< 50/0 ml	ASTM D 892
Protection against corrosion	Pass	1 <sup>st</sup> step CETOP R 48 H (DIN 51345)
Tolerance against combustion	Pass	Spray test
Specific Heat Capacity	2,06 kJ/kg °C	ASTM D 2766
Toxicity and effect on environment	LCO 105 mg/l LC50 120 mg/l	OECD 203

## Corrosion Protection:

Corrosion of copper:	corrosion grade 1-100 A3 (no corrosion)	DIN 51759
Corrosion on steel:	corrosion grade 0-A (no corrosion)	DIN 51585

## Antiwear Properties:

### Four-ball-machine test (VKA) 1 h/400 N

- wear-diameter: 0.36 mm

### Vickers vane-pump test V 105 C (140 bar)

- wear after 250 h: 7 mg

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FZG-test A/8.3/90 DIN 51354 Part 2

- wear rate (=Schandenskraftstufe): >12

This test rates fluids from 1 –12 (12 is the best)

**Elastomers:**

**ENVOLUBRIC HE 46** is compatible with all common elastomers applied in hydraulic systems (see enclosed table). Usually NBR (nitride butadiene rubber) is applied. Normally elastomers do not have to be replaced when a system is being converted to **ENVOLUBRIC HE 46**.

**Stability of ENVOLUBRIC HE 46:**

**ENVOLUBRIC HE 46** is chemically very stable. In contrast to hydraulic fluids based on natural esters (triglycerides), it can be stored in sealed containers for a long period of time without a change of properties.

**Conversion of a system to ENVOLUBRIC HE 46:**

Even though **ENVOLUBRIC HE 46** is miscible with crude oil based hydraulic oils or phosphoric esters in case of the conversion of a system to **ENVOLUBRIC HE 46**, residues of both types should be removed from the system and thoroughly as possible because they influence the bio-degradability of **ENVOLUBRIC HE 46**. Therefore a system flush with the min. quantity necessary to operate the hydraulic system with **ENVOLUBRIC HE 46** is recommended. After approx. 2-3 days of operation the system should be drained and cleaned again and filled with fresh **ENVOLUBRIC HE 46**.

compatible elastomers	
ISO 1629-1995 nomenclature	ASTM D 1418-01a-nomenclature
NBR	NBR
MQ	MQ
FVMQ	MFQ
FKM	FKM
<b>PTFE=Poly-Tetra-Fluoro Ethylene</b>	

incompatible elastomers	
EPM	EPM
EPDM	EPDM
IIR	IIR
<b>Neopren</b>	

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