

## PLANTOSYN 32 HVI, 46 HVI, 68 HVI

### Environmentally acceptable hydraulic fluid and lubricating oil based on saturated synthetic esters

#### Description

The PLANTOSYN HVI oils are environmentally acceptable high-performance hydraulic and lubricating oils based on saturated synthetic esters. These oils can be used universally in all hydraulic systems, even under severe operating conditions. PLANTOSYN 46 HVI has been tested and approved by well-known manufacturers of hydraulic components like Bosch Rexroth and Sauer Sundstrand. PLANTOSYN HVI products fulfill and surpass the requirements according to ISO 15380. PLANTOSYN HVI products are compatible with materials usually found in hydraulic systems. For dynamic stress as seals the use of viton FKM material is recommended.

#### Application

PLANTOSYN HVI oils are rapidly biodegradable synthetic saturated ester oils for the toughest demands. They can be used in all applications in mobile and stationary hydraulic units where the use of biodegradable synthetic ester based hydraulic oil according to ISO 15380 HEES is recommended. The PLANTOSYN HVI products should be used where oil leakage or oil spillage will give a soil or water pollution. PLANTOSYN HVI products can be used as an alternative to conventional HLP/HM hydraulic oils and have proved their perfect suitability in many applications (construction machinery, earth moving equipment, loading cranes, floor conveyor vehicles and hydraulic platform systems in trucks, harvesters). The application temperatures can be between -30 °C and 100 °C tank temperatures. Temperatures above 100 °C are temporarily possible.

#### Advantages

- Based on renewable resources
- Rapidly biodegradable (> 60 % acc. to OECD 301 B)
- Multi-purpose characteristic (multi grade)
- Miscible with mineral oil and polyalphaolefin
- Excellent viscosity temperature behaviour (high VI)
- Good low temperature behaviour
- Shear stable
- Good corrosion protection
- Natural mild cleaning properties
- Very high resistance to ageing, high thermal stability
- Excellent hydrolytic stability
- Very good wear protection
- Excellent lubricating properties
- Lifetime lubricating possible

EU Ecolabel : DE/027/273



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#### Application (continued)

The changing over procedures according ISO 15380 have to be observed. After changing over to PLANTOSYN HVI fluids the oil filters in the hydraulic system have to be controlled after 50 operating hours and, if necessary, changed.

#### Specifications/Approvals

The products of the PLANTOSYN HVI series fulfill and surpass the requirements of:

- ISO 15380: HEES (saturated esters)
- European EU Ecolabel (biologically degradable hydraulic fluids)
- Swedish Standard SS 15 54 34

PLANTOSYN 68 HVI can be also used as a full-featured industrial gear oil CLP according to DIN 51517-3.

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Typical technical data:

PLANTOSYN					
Product name		32 HVI	46 HVI	68 HVI	
Properties	Uni				Test method
Density at 15 °C	kg/m <sup>3</sup>	915	913	916	ISO 12185, ISO 3675
Colour		0.5	0.5	0.5	ISO 2049
Appearance at 25 °C		clear, bright	clear, bright	clear, bright	
Flashpoint in open cup acc. to Cleveland	°C	220	280	280	ISO 2592
Kinematic viscosity					ISO 3104
at -20 °C	mm <sup>2</sup> /s	1450	2100	4820	
at 0 °C.	mm <sup>2</sup> /s	270	440	750	
at 40 °C	mm <sup>2</sup> /s	32	46	68	
at 100 °C	mm <sup>2</sup> /s	6.2	8.2	10.6	
Viscosity index	-	148	150	143	DIN ISO 2909
Pourpoint	°C	-46	-36	-30	ISO 3016
Low temperature fluidity after 7 days	°C	stable	stable	stable	ASTM D 2532
Neutralisation number	mg KOH/g	0.55	0.55	0.55	ISO 6618
Water content	mg/kg	< 500	< 500	< 500	ISO 12 937, ISO 6296
copper corrosion (3 h, 100 °C)	degree of corrosion	1	1	1	ISO 2160
Rust prevention procedure A	degree of corrosion	0 - A	0 - A	0 - A	ISO 7120
Foaming					ISO 6247
Seq. I, at 24 °C	ml	0/0	0/0	0/0	
Seq. II, at 93 °C	ml	0/0	0/0	10/0	
Seq. III, at 24 °C	ml	0/0	0/0	0/0	
Air release at 50 °C	min	3	6	8	ISO 9120
Water separation time to 3 ml emulsion at 54 °C	min	10	25	25	ISO 6614

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Typical technical data (continued):

PLANTOSYN					
Product name		32 HVI	46 HVI	68 HVI	
Properties	Unit				Test method
Elastomer compatibility after 1.000 h		Test temperature at			ISO 6072
		80 °C	80 °C	100 °C	
Change in hardness NBR 1		- 5.3	- 6.7	- 6.0	
Change in volume NBR 1	%	12.4	11.2	9.9	
Change in elongation NBR 1	%	- 8.0	- 10.4	- 25.6	
Change in tensile strength NBR 1	%	- 15.9	- 7.7	- 29.2	
Change in hardness HNBR1		- 5.7	- 4.9	- 4.2	
Change in volume HNBR1	%	11.8	9.7	8.3	
Change in elongation HNBR1	%	- 9.6	- 8.9	- 7.1	
Change in tensile strength HNBR1	%	- 7.0	- 5.8	- 8.9	
Change in hardness FPM AK 6		- 1.2	- 1.1	- 0.9	
Change in volume FPM AK 6	%	1.2	1.0	0.9	
Change in elongation FPM AK 6	%	- 7.5	- 8.2	- 13.1	
Change in tensile strength FPM AK 6	%	9.0	8.0	1.5	
Change in hardness AU		0.5	0.4	0.2	
Change in volume AU	%	- 0.6	- 0.5	- 0.3	
Change in elongation AU	%	- 8.1	- 7.9	- 25.3	
Change in tensile strength AU	%	- 4.3	- 5.2	14.9	
Oxidation stability					ASTM D 943
Modified TOST test, dry TOST					without water
time to reach Delta TAN					
2.0 mg KOH/g	h	> 4000	> 2000	> 2000	
Baader test, 110 °C, 72 h					DIN 51554-3
increase in viscosity at 40 °C	%	< 1	< 1	< 1	
Load carrying properties	failure	11	12	> 12	ISO 14 635-1,
FZG A/8.3/90	load stage				DIN 51354-2
Vane pump (Vickers V105C)					ISO 20763
- weight loss ring	mg	13	< 120	< 120	DIN 51389-2
- weight loss vanes	mg	10	< 30	< 30	