

BIOHYDRAN SY NS



LUBRICATION

NO SHEEN TECHNOLOGY

Passes U.S. Coast Guard CFR 435 Static Sheen Test



TOTAL

Synthetic, Biodegradable, Anti-Wear Hydraulic Oil.

APPLICATIONS

Environmentally friendly, biodegradable, synthetic hydraulic fluids.

- **BIOHYDRAN SY NS HYDRAULIC FLUIDS** are high performance, biodegradable, synthetic, anti-wear hydraulic fluids. These fluids were developed for hydraulic systems operating in industrial, marine, or mobile service.
- **BIOHYDRAN SY NS HYDRAULIC FLUIDS** are water soluble unlike most other hydraulic fluids. They do not break down to form sludge or varnish. Spills into waterways will not leave an oil-like sheen. Their low toxicity and biodegradability cause them to have a low environmental impact for small spills.
- **BIOHYFRAN SY NS HYDRAULIC FLUIDS** exhibit 80% biodegradability in OECD 301B

SPECIFICATIONS

Meets International specifications.

- EPA VGP COMPLIANT
- US EPA CFR 435 static sheen test.
- AFNOR NF E 48-603 HV
- VICKERS I-286-S, M-2950-S
- DIN 51524 PART 3 CATEGORY HVLP
- CINCINNATI MACHINE P68, P69, P70
- ISO 6743/4 CATEGORY HV

ADVANTAGES

Biodegradable in case of spills in environmentally sensitive areas.

- Excellent anti-wear, anti-foam, and anti-corrosion properties.
- Highly biodegradable.
- Very high viscosity index.
- Excellent shear stability and thermal stability.
- Water soluble, no sheen.
- Very low pour point.
- Low temperature fluidity.

TYPICAL CHARACTERISTICS	METHODS	BIOHYDRAN SY NS FLUIDS		
ISO Viscosity Grade		32	46	68
Viscosity at 40°C, cSt	ASTM D 445	34.0	46.0	68.0
Viscosity at 100°C, cSt	ASTM D 445	7.6	9.1	13.7
Viscosity Index	ASTM D 2270	200	205	209
Specific Gravity @ 60/60°F	ASTM D 1298	1.06	1.06	1.03
Density @ 60°F, lbs/gal	ASTM D 1298	8.83	8.83	8.86
Pour Point, °F(°C)	ASTM D 97	-45(-43)	-40(-40)	-54(-48)
Flash Point, COC, °F(°C)	ASTM D 92	543(284)	572(300)	582(306)
Oxidation Test, hrs.	ASTM D 943	1800	1848	1890
FZG Visual Gear Test, Stages Passed		12	12	12

TOTAL Specialties USA, Inc.

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BIOHYDRAN

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This lubricant must be applied as recommended and used for the application for which it was designed. TOTAL Specialties USA, Inc. will have no responsibility for any injury to persons or property resulting from misuse or misapplication of the lubricant. A safety data sheet conforming to the OSHA Hazard Communication Standard 29 CFR Section 1910.1200 can be downloaded at www.totalspecialties.com. Copyright 2016 All rights reserved.

ENGINEERING DATA

PERFORMANCE PROPERTIES	TEST METHOD	ISO 32	ISO 46	ISO 68
FZG Visual Gear Test, Stages Passed	ASTM D 5182	12	12	12
Four Ball EP Test	ASTM D 2783			
Load Wear Index		32.94	33.1	33.26
Last Non-seizure, 80Kg (mm scar)		0.40	0.40	0.39
Last Seizure, 126 Kg (mm scar)		2.75	2.6	2.53
Weld Load, Kg		160	160	160
V104 Vane Pump Test (total mg wear)	ASTM D 7043	<10	<10	<10
35 VQ Vickers Vane Pump Test1	M-2950-S	Pass	-	-
Individual Cartridge Wear, Mg		8, 8, 8	-	-
Average Wear, mg.		8	-	-
Sonic Shear Stability	ASTM D 5621			
Initial Viscosity@40C (cSt)		36.8	47.1	68.9
Irradiated Viscosity@40C (cSt)		36.9	47.0	69.2

Physical-Chemical Properties	TEST METHOD	ISO 32	ISO 46	ISO 68
Specific Gravity @ 20C	ASTM D 1298	1.031	1.035	1.041
Foam Test	ASTM D 892			
Sequence I, Initial Volume/ml		10/0	10/0	10/0
Sequence II, Initial volume/ml		10/0	10/0	10/0
Sequence III, Initial volume/ml		10/0	10/0	10/0
Vapor Pressure (mm Hg)	ASTM E 1719	<0.01	<0.01	<0.01
Specific Heat (Cal/g/C	ASTM E 1269	0.476	0.481	0.478
Pour Point, C	ASTM D 97	-59	-51	-51
Ash Content (%)	ASTM D 482	0.011	0.008	0.008
Corrosion Protection (TORT)	ASTM D 665A	Pass	Pass	Pass
Copper Strip Corrosion	ISO 22160	1b, shiny	1a, shiny	1a, shiny
Aging Behavior (Hrs.)	DIN 51587			
mh KOH/g		1.14	0.92	0.31
Hours		1.008	1.008	1.008
Coefficient of Expansion				
@20C		0.00078	0.0008	0.00079
@55C		0.0008	0.00078	0.00078
Weight, lbs/gal. (20C)		8.57	8.57	8.58

ENGINEERING DATA

Viscosity Properties	TEST METHOD	ISO 32	ISO 46	ISO 68
Viscosity @ 40C (cSt)	ASTM D 445	35.4	46.0	68.0
Viscosity @ 100C (cSt)	ASTM D 445	8.0	9.8	13.7
Viscosity @ 0C (cSt)	ASTM D 445	294	390	614
Viscosity Index	ASTM D 2270	194	200	209

HYDRAULIC SYSTEM CHANGEOVER

Please follow OEM recommended changeover procedure if possible. BIOHYDRAN SY NS will provide outstanding performance in all hydraulic systems. In order to maximize the performance of BIOHYDRAN SY NS the following steps are highly recommended-

- The hydraulic system is thoroughly clean and free of contamination such as the previously used fluid or deleterious effects from the previously used fluid (varnish, carbon, etc).
- All system filters are new
- Paint, plastics, seals and elastomers are compatible
- Standard accepted industrial changeover procedure is followed (OEM)

CHANGEOVER PROCEDURE

- Drain previously used fluid from system
- Replace filters
- Fill the system with BIOHYDRAN SY NS. Run and circulate under minimum load for 24 hours. Because of the polar nature of BIOHYDRAN SY NS, it will generally clean any remaining sludge, carbon or varnish from the lubricant system.
- Thoroughly drain the BIOHYDRAN SY NS from the system while warm
- Inspect filters and replace if needed
- Fill the equipment with fresh BIOHYDRAN SY NS and begin normal operation
- Monitor filter pressures and change when required

Please contact TOTAL Technical Services (1-800-323-3198) for any additional conversion information

COMPATIBILITY

OTHER HYDRAULIC FLUIDS

BIOHYDRAN SY NS Fluids are not compatible with hydrocarbon-based hydraulic fluids. As with any fluid conversion, recognized industry procedures including system cleanup and flushing should be followed

PAINTS

PAG-based fluids such as BIOHYDRAN SY NS show some solvency for common oil-based paints but minimal solvency for many epoxy-based paints. If interior surfaces of hydraulic components are painted, it may still be possible to convert to a PAG-based fluid. Extra care should be taken to ensure that lifted paint trapped by the filter does not cause the pump to be starved of lubricant. Following the conversion, the painted surfaces should be carefully monitored for trends toward paint softening, lifting, and peeling. If paint removal does occur, frequent cleaning or replacement of filters may be required until the paint is completely removed.

ELASTOMERS

Biohydran SY NS Fluids are suitable for use with many elastomeric materials used in seals and gaskets. Below is a partial list of compatible elastomers

VITON	EPR	EPDM
KALREZ	BUTYL RUBBER	NATURAL BLACK RUBBER
SILICONE	BUNA N	NATURAL RED RUBBER
POLYSULFIDE	FLUORAZ	AFLAS

Because of variations that can exist between elastomers within the same generic family, it is important to test the compatibility of specific elastomers that are to be used in any critical application.

PLASTICS

Compatibility should be assessed for any plastic components (such as reservoir sight glasses) exposed to hydraulic fluid

PLASTIC	25C	100C
Polypropylene	Recommended	Recommended
Polyethylene, Low density	Recommended	Recommended
Homalite Polycarbonate	Not Recommended	Not Recommended
Lucite/Plexiglas Polymethylmethacrylate	Not Recommended	Not Recommended
Polyurethane	Not Recommended	Not Recommended

Because of variations that can exist between plastics within the same generic family, it is important to test the compatibility of specific plastics that are to be used in any critical application.

REGULATORY AND DISPOSAL

Requirements for reporting accidental fluid spills and discharges may vary from state to state and from municipality to municipality. It is important that you contact the appropriate authorities in your local area to clearly understand any reporting or other requirements.

REGULATORY INFORMATION

- SARA Section 302 & 304 Reportable Quantities for Extremely Hazardous Substances- **NONE**
- CERCLA Sections 102 & 103 (Reportable Quantities for Hazardous Substances) – **NONE**
- Superfund Amendments and Reauthorization Act of 1986 Title III Section 313 – **NONE**
- U.S. Toxic Substances Control Act – **All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30**
- European Inventory of Existing Commercial Chemical Substances (EINECS) – **The components of this product are on the EINECS inventory or are exempt from inventory requirements**
- Canadian Domestic Substances List- **All substances contained in this product are not considered as persistent, bioaccumulative, and/or inherently toxic to the environment**
- California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986- **This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.**
- Pennsylvania (Worker and Community Right-To-Know Act):
- Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List- **This product does not contain chemicals at levels which require reporting under this statute.**

READILY BIODEGRADABLE	
PRODUCT	28 Day % Biodegradable*
BIOHYDRAN SY NS 32	81
BIOHYDRAN SY NS 46	72
BIOHYDRAN SY NS 68	80

*All Products Are Considered Biodegradable and were tested via Method OECD 301F

Non-Sheening Passes Static Sheen Test (BIOHYDRAN SY NS 46)		
Appendix 1 to Subpart A of 40 CFR 435	Static Sheen Test @ 23C, 15ml sample, distilled water, 15 minutes observation time	Observations; No sheen, No Gloss, No increase in reflectivity, No color, No iridescence, No oil slick

Biochemical Oxygen Demand

PRODUCT	BOD5	BOD10	BOD20	BOD28
BIOHYDRAN SY NS 32	0.00	-4.44	65.68	69.14
BIOHYDRAN SY NS 46	-0.50	-3.99	60.29	67.76
BIOHYDRAN SY NS 68	0.00	-1.91	43.4	71.53

Toxicity Results for Aquatic Species

PRODUCT	Fresh Water Species		Sea Water Species	
	48 h EL50 (mg/L) with water flea (Daphnia magna)	96 h LL50 (mg/L) with Fathead minnow (Pimephales promelas)	96 h LL50 (mg/L) with Mysid shrimp (Mysidopsis bahia)	96 h LL50 (mg/L) with Sheephead minnow (Cyprinodon variegatus)
BIOHYDRAN SY NS 32	750	/	200	>1000
BIOHYDRAN SY NS 46	430	297	250	>1000
BIOHYDRAN SY NS 68	170	/	330	>1000

/=Not tested, results expected to be equivalent to BIOHYDRAN SY NS

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