COPY

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JOB Monsanto Fire Resistant Hydraulic Fluid

(W. D. Lubic, MICC, B1NB; 4-2630)

Cover

MONSANTO

FIRE RESISTANT HYDRAULIC FLUIDS

designed for optimum operating efficiency,
greater safety and minimum maintenance.

Monsanto was the pioneer in the development of synthetic fire resistant lubricants. Over the past quarter century, specialized functional fluids have been developed to meet every required operating condition in all types of specialized hydraulic equipment. The fluids range from all-synthetic phosphate ester based products to economical water-glycol fluids. All fluids are fire resistant type lubricants. The choice of viscosity/temperature characteristics available assures optimum machine response and dependable operation under whatever climatic and operating conditions are necessary.

Check over the range and types of hydraulic fluids that are available. Monsanto will provide you with detailed performance information on the one's that interest you.

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Monsanto

TOWOLDMON0024371

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PYDRAUL "E" SERIES

All-synthetic Premium Grade Fluids

Straight phosphate-ester lubricants offering long service life, excellent lubricity, freedom from corrosion and foam. "E" series fluids can be reclaimed, re-used.

	PYDRAUL® 10-E	PYDRAUL 29-E-LT	PYDRAUL 30-E	PYDRAUL 50-E	PYDRAUL 65-E	PYDRAUL 115-E
PHYSICAL PROPERTIES						
Appearance	Clear Blue Liquid	Clear Blue Liquid	Clear Blue Liquid	Clear Blue Liquid	Clear Blue Liquid	Clear Blue Liquid
Spec. Gravity 25/25°C.	1.085–1.095	1.090–1.110	1.155–1.175	1.145–1.165	1.142–1.162	1.145–1.165
Neutralization No. (mg KOH/g) max.	0.25	0.35	0.15	0.15	0.15	0.15
Moisture (max.) %	0.10	0.15	0.10	0.10	0.10	0.10
VISCOSITY						
Centistokes @ 100°F.	10.0 cs	30.9 cs	32 cs	49 cs	67.3 cs	122 cs
@ 210°F.	2.4 cs	7.9 cs	4.8 cs	5.9 cs	7.1 cs	9.1 cs
SSU @ 100°F.	60 SSU	145 SSU	150 SSU	231 SSU	312 SSU	555 SSU
@ 210°F.	35 SSU	52 SSU	42 SSU	46 SSU	50 SSU	56 SSU
Absolute SSU @ 100°F.	60.5 SSU	158 SSU	174 SSU	262 SSU	349 SSU	644 SSU
(SSU's Density) @ 210°F.	35 SSU	54 SSU	47 SSU	50 SSU	54 SSU	61 SSU
Pour Point	−70°F.	−45 °F.	−15 °F.	−5 °F.	0 °F.	[illegible] °F.
Bulk Temp. Max. (continuous operation)	175°F.	175 °F.	225°F.	225 °F.	225 °F.	225 °F.
Boiling Point °F. at 760 mm Hg	707°F.	500 °F.	725 °F.	750 °F.	780 °F.	820 °F.
Coefficient of Thermal Expansion per °F.	0.00044	0.00040	0.00035	0.00035	0.00035	0.00035
Specific Heat BTU lb/°F @ 77°F.	0.42	0.39	0.36	0.37	0.38	0.38
Thermal Conductivity BTU hr/ft²/°F.	0.047	0.0757	0.0737	0.0739	0.0726	[illegible]
Vapor Pressure mm Hg @ 200°F.	0.002	0.002	0.002	0.002	0.001	[illegible]
Bulk Modulus (Room Temp. 1000-5000 psi)	325,000	370,000	390,000	392,000	395,000	397,000
Pour Test ASTM D 665	Pass	Pass	Pass	Pass	Pass	Pass
Foam Test ASTM D 892	Pass	Pass	Pass	Pass	Pass	Pass
Solubility in Water	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
FIRE RESISTANCE TESTS						
Factory Mutual Spray Test. Test fluid sprayed at 1000 psi through orifice, [illegible] of propane torch.	Fail	Pass	Pass	Pass	Pass	Pass
Factory Mutual Channel Iron Test. Test fluid sprayed at 1000 psi through orifice [illegible] at 1500°F.	Fail	Pass	Pass	Pass	Pass	Pass
Hot Manifold Test (Federal Test Method Std. 791). Test fluid dropped on at 1000°F.	Intermittent flashing but does not propagate to pan below.	Intermittent flashing but does not propagate to pan below.	Intermittent flashing but does not propagate to pan below.	Intermittent flashing but does not propagate to pan below	Intermittent flashing but does not propagate to pan below.	Intermittent flashing but does not propagate to pan below.
Factory Mutual Approval. FM	No	Yes	Yes	Yes	Yes	Yes

PYDRAUL "C" SERIES

Phosphate-ester Base Economy Grade Fluids

A unique phosphate ester base formulated with two petroleum fractions to produce a fire resistant lubricant in a range of viscosity indices.

	PYDRAUL® 230-C	PYDRAUL 312-C	PYDRAUL 540-C
PHYSICAL PROPERTIES Appearance	Clear Green Liquid	Clear Green Liquid	Clear Green Liquid
Spec. Gravity 25/25°C.	1.040–1.050	1.030–1.050	1.030–1.050
Neutralization No. (mg KOH/g) max.	0.30	0.30	0.30
Moisture (max.) %	0.15	0.15	0.15
VISCOSITY			
Centistokes @ 100°F.	46.2 cs	66 cs	106 cs
@ 210°F.	6.9 cs	8.4 cs	10.5 cs
SSU @ 100°F.	215 SSU	309 SSU	491 SSU
@ 210°F.	49 SSU	64 SSU	61 SSU
Absolute SSU @ 100°F.	224 SSU	311 SSU	496 SSU
(SSU x Density) @ 210°F.	49 SSU	52 SSU	59 SSU
Pour Point	– 70 °F.	– 10°F.	0°F.
Bulk Temp. Max. (continuous operation)	200°F.	200°F.	200°F.
Boiling Point °F. at 760 mm Hg	500 F.	540 F.	545 F.
Coefficient of Thermal Expansion per °F.	0.00038	0.00036	0.00036
Specific Heat BTU/lb./°F. @ 77° F.	0.41	0.41	0.43
Thermal Conductivity BTU/hr./ft./°F.	0.0755	0.0760	0.0743
Vapor Pressure mm Hg @ 200°F.	0.24	0.20	0.22
Bulk Modulus (Room Temp. 1000-6000 psi)	332,000	329,000	336,000
Rust Test ASTM D 665	Pass	Pass	Pass
Foam Test ASTM D 892	Pass	Pass	Pass
Solubility in Water	Negligible	Negligible	Negligible
FIRE RESISTANCE TESTS			
Factory Mutual Spray Test. Test fluid sprayed at 1000 psi through orifice, passed through flame of propane torch	Pass	Pass	Pass
Factory Mutual Channel Iron Test. Test fluid sprayed at 1000 psi through orifice, onto hot channel iron at 1300°F.	Pass	Pass	Pass
Hot Manifold Test (Federal Test Method Std. 791). Test fluid dropped on at 1300°F.	Intermittent flashing but does not propagate to pan below	Intermittent flashing but does not propagate to pan below	Intermittent flashing but does not propagate to pan below
Factory Mutual Approval. FM	Yes	Yes	Yes

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SANTOSAFE W/G SERIES

Water-Glycol Fluids

Designed for systems with unavoidable fluid loss and where recovery is impractical.

FLUID SANTOSAFE®		W/G 15	W/G 20	W/G 30
Appearance		Red Liquid with a slight haze		
Specific Gravity @ 20/20°C		1.076	1.08	1.073
Water Content (% by weight)		43.4	43.0	40.0
Viscosity				
Centistokes	@ 130°F	21.1	28.0	29.7
	100°F	32.6	47.0	59.3
	0°F	499.6	700	1050
Saybolts as measured				
	130°F	97	130	140
	100°F	150	200	275
	0°F	2300	2600	4600
Absolute Saybolts (SSU x density)	130°F	104	140	150
	100°F	161	216	296
	0°F	2475	2808	4950
Viscosity Index		155 min.	155 min.	155 min.
Pour Point Min.		−40°F	−40°F	−40°F
pH at 25°C		9.4	9.4	9.3
Alkaline Content (ml. 0.1N HCl to neutralize 100 ml. of fluid to pH 5.5)		164	165	176
Rust Test (ASTM)		Pass	Pass	Pass
Flash Point (COC)		None	None	None
Weight per gallon, lbs @ 60°F		9.00	9.00	9.00

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TOWOLDMON0024374

PYDRAUL MC

Waterless Phosphate-ester Fluid Formulated For Mining Equipment

A constant composition fluid that meets the fire resistance requirement of the U.S. Bureau of Mines Schedule #30.

Appearance	Clear Green Liquid
Specific Gravity 25/25°C.	1.098
Density at	
140°F.	1.075 grams/ml.
77°F.	1.100 grams/ml.
Neutralization No. (mg KOH/g) max.	0.30
Moisture (max.) %	0.15
Viscosity	
Centistokes @ 40°F.	1250 cs
@ 100°F.	69 cs
@ 210°F.	6.9 cs
SSU @ 40°F.	5800 SSU
@ 100°F.	320 SSU
@ 210°F.	48 SSU
Pour Point	-10°F.
Coefficient of Thermal Expansion per °F.	0.00034
Specific Heat BTU/lb./°F. @ 77°F.	0.39
Thermal Conductivity BTU/hr./ft./°F.	0.0728
Solubility in Water	Negligible

TOWOLDMON0024375

PYDRATEK-100

Fire Resistant Preservative Fluid For New And Stand-by Equipment

A corrosion and rust protection fluid whose liquid film preserves metal surfaces for up to 12 months. May be applied by spray, dip, brush, wiped on or as an internal fill-and-drain with no removal necessary before adding the operating fire resistant hydraulic fluid. Protects metal surfaces for up to twelve months.

Pydratek-100 passes High Pressure Spray Tests (sprayed at 1000 psi through oxyacetylene flame @ 6000°F.) without flashing or igniting with torch up to 3 feet from oriface. (AMS-3150 C, 4.9.32 and Federal Test Method Std. 791.) It has good temperature stability in prolonged storage at -30°C cycled to 70°F. and remains clear.

	Centistokes	SSU
Viscosity @ 0°F	45,000	209,000
@ 20°F.	4,380	20,000
@ 100°F.	43.7	203
@ 210°F.	5.1	43
Pour Point, °F.	-5	
Specific Gravity, 60°/60°F.	1.154	
Acidity, Total Acid No.	10.3	
Flash Point (Cleveland Open Cup)	465°F.	
Fire Point (Cleveland Open Cup)	565°F.	

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TOWOLDMON0024376

OPERATING ADVANTAGES OF PYDRAUL FLUIDS

Pydraul fire resistant fluids assure excellent lubrication, long pump life and efficient equipment operation with minimum maintenance. The use of a fire resistant fluid frequently lowers insurance premiums below the costs for operating with petroleum oils. Pydraul fluids are heat- and shear stable, inhibit metal corrosion, eliminate foaming and permit equipment to operate at optimum response capability.

SERVICE-PROVED APPLICATIONS OF PYDRAUL FLUIDS

Steel Industry	Aluminum Industry	Forging And Extrusion
Continuous casters	Stripper cranes	Forge presses
Rolling mills	Direct chill casters	Extrusion presses
Furnaces	Furnaces	Billet manipulators
Scrap chargers	Rolling mills	
Stripper cranes	Shearers	
Arc welders	Combustion controls	
Combustion controls	mobile equipment	
Mobile equipment		

Diecasting	Fabrication	Foundries
Diecast machines	Forming presses	Furnaces
Trim presses	Welders	Molding lines
	Furnaces	

Mining Industry

Power shovels & draglines
Blasthole drills
Bulldozers & rippers
Tractors
Scrapers & Graders
Crushers
Ore Feeders
Trucks
Jumbos
Ore Drills
Mechanical Loaders & Scrapers

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CONVERSION TO PYDRAUL FLUIDS

Changing over to a fire resistant Pydraul fluid is quite simple, a matter of selecting the proper material composition of seals and packings. Operating experience shows the preferred materials are Vitron*, Teflon* or silicone rubber. Monsanto provides detailed information on change-over and most equipment manufacturers familiar with Pydraul fluids will do the same.

For more detailed information, check the types of fluid(s) that interest you.

Please send me further data on:

/___/ Pydraul "Series E" Premium Fluids

/___/ Pydraul "Series C" Economy Fluids

/___/ Pydraul "Series W/(Water Clycol Fluids

/___/ Pydraul MC Mining Equipment Fluid

/___/ Pydratek-100 Preservative Fluid

The type of hydraulic equipment we operate is:_____

_____with fluid capacity of approx. _____ gallons _____ operating in a temperature range of _____°F.

Name _____ Title _____

Company _____

Address _____

City _____ State _____ Zip _____

[Postage Paid Reply Indicia]

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