PYDRAUL* E SERIES FLUIDS

Low Temperature Fluids

Pydraul 10E and Pydraul 29E LT are "all phosphate ester" fluids which offer improved performance at low temperatures combined with excellent shear stability. The number represents the viscosity in centistokes at 100°F. and the E denotes phosphate ester. The viscosity grades correspond approximately to 60 and 140 SSU at 100°F. Pydraul 10E was formerly called and is identical with Pydraul 60.

In addition to good low temperature characteristics, Pydraul 10E and Pydraul 29E LT have the added advantages of fire resistance, excellent lubricating ability, total stability under use conditions, ease of handling and good materials compatibility. These fluids should provide excellent performance in nearly all industrial hydraulic and control systems.

Specifications and typical properties for Pydraul 10E and Pydraul 29E LT are listed on the following pages. Additional information can be obtained from your Monsanto representative.

* Pydraul is a registered trademark of Monsanto Company

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Monsanto Specifications

	Pydraul 10E	Pydraul 29E LT
Appearance	Clear blue liquid	Clear blue liquid
Specific Gravity, 25°/25°C.	1.088-1.091	1.093-1.113
Moisture, maximum	0.10%	0.15%
Neutralization Number (acidity), maximum	0.25	0.35
Viscosity in centistokes at 100°F.	9.6-10.4	29-33
Weight per gallon, pounds at 77°F. (approx.)	9.06	9.18

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Typical Properties

Property	Pydraul 10E	Pydraul 29E LT
Viscosity, centistokes		
210°F.	2.40	6.9
100°F.	10.0	30.9
40°F.	48	148
Viscosity, SSU		
210°F.	34	49
100°F.	58	145
40°F.	220	680
Pour Point, °F.	-70	-45
Specific Gravity, 25/25°C.	1.089	1.10
Density, grams/ml.		
210°F.	1.031	1.040
100°F.	1.081	1.090
40°F.	1.113	1.122
Moisture, % maximum	0.10	0.15
Acidity, NN maximum	0.25	0.35
Specific Heat, BTU/lb/°F.		
77°F.	0.42	0.39
100°F.	0.43	0.40
150°F.	0.45	0.42
200°F.	0.47	0.44
Thermal Conductivity, BTU/hr/°F/ft.		
77°F.	0.0770	0.0757
100°F.	0.0765	0.0754
150°F.	0.0759	0.0747
200°F.	0.0750	0.0740
Vapor Pressure, mm HG at 200°F.	0.002	0.002

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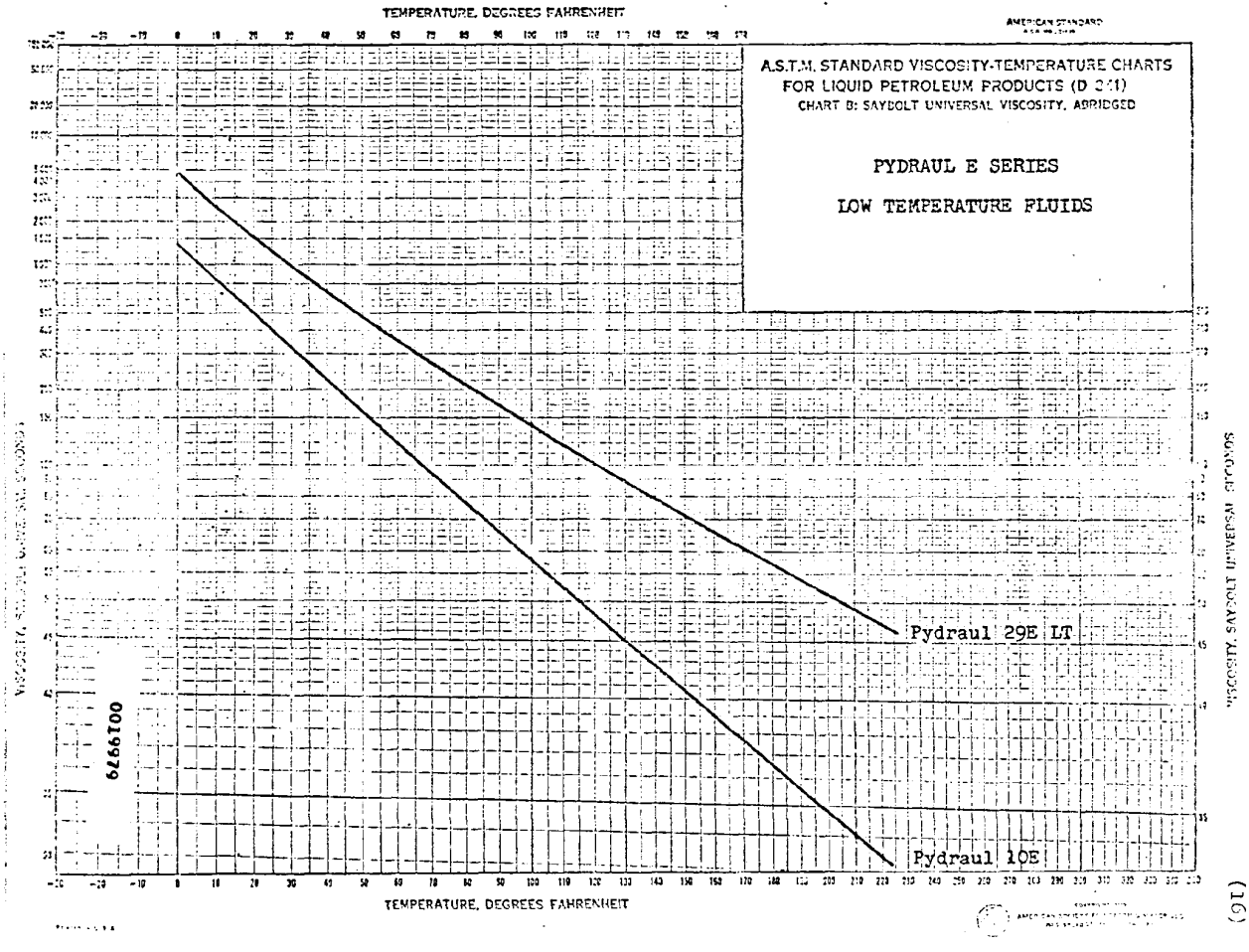

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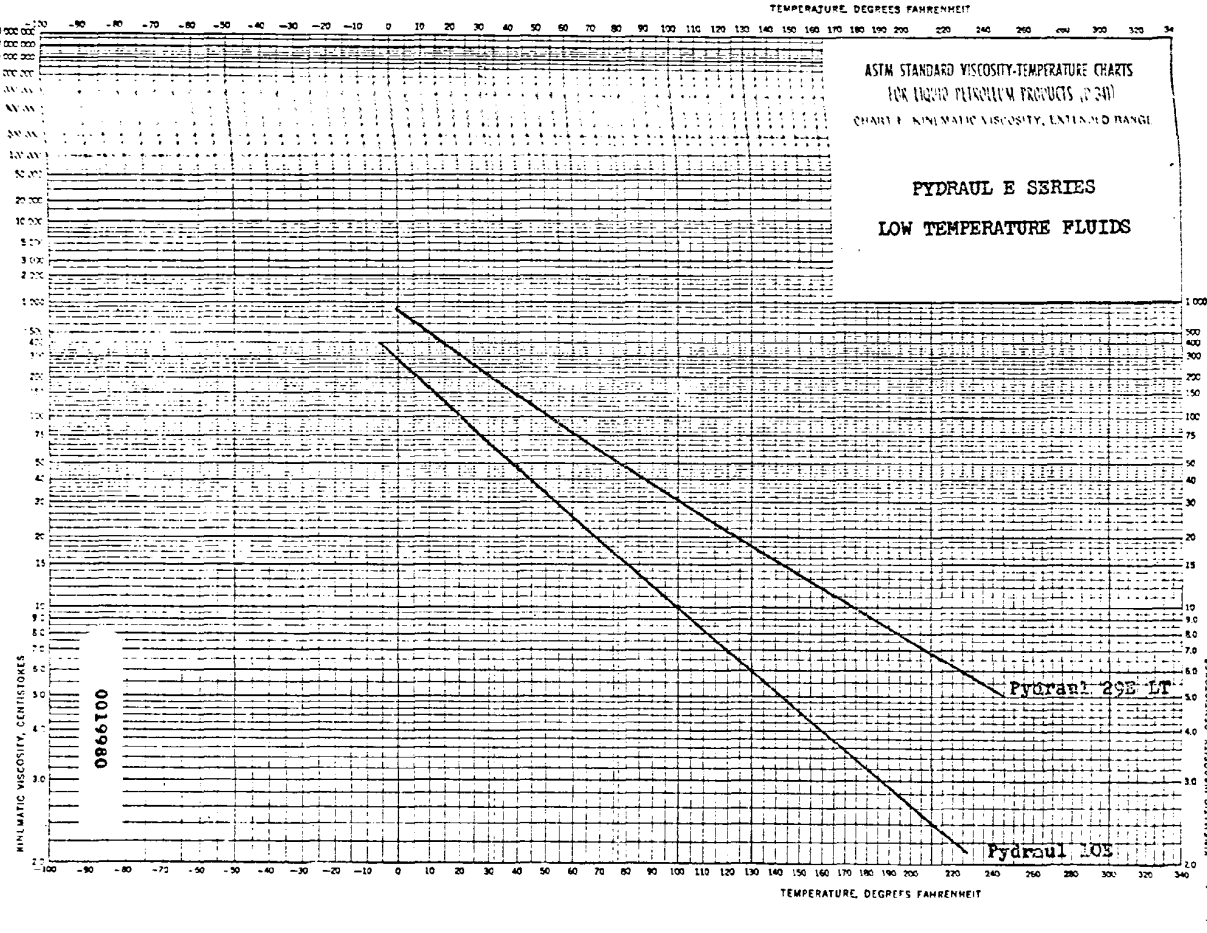

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Fire Resistance

Property	Pydraul 10E	Pydraul 29E LT
Flash Point, °F.	435	485
Fire Point, °F.	460	505
AIT, °F. (ASTM D2155)	970	940
High Pressure Spray (AMS 3150C)	Intermittent flashing, self-extingusihing	Intermittent flashing, self-extinguishing
Hot Manifold (FS 791)		
1300°F.	Flashes, does not propagate	Flashes, does propagate
950°F.	No flashing or burning	No flashing or burning
Molten Metal Test at 1300°F.	No ignition	No ignition
FM Approval	No	Yes

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Performance Properties

Property	Pydraul 10E	Pydraul 29E LT
Four Ball Wear Test, scar diameter in mm. 625 rpm, 167°F., 1 hr.		
Steel on steel		
10 kg load	0.27	0.39
40 kg load	0.48	0.53
Steel on bronze		
10 kg load	0.82	0.48
40 kg load	2.35	1.00
Rust Test (ASTM D665) 24 hr., distilled water	Pass	Pass
Foam Test (ASTM D892) Sequence 1, 2, 3	Pass	Pass
Oxidation and Corrosion Test (FS 791-5308) 168 hr., 250°F., 5 l. air per hr.		
Metal weight changes in mg/cm^2		
Magnesium	-	0.00
Aluminum	-	-0.12
Cadmium	-	-0.04
Steel	-	-0.01
Copper	-	-0.02
Acidity increase, NN	-	-0.02
100°F. viscosity increase, %	-	+0.8

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Compatibility with Materials

Metals

The Pydraul E Series Fluids are compatible with all commonly used metals of construction.

Packings, Seals, Hoses and Bladders

Materials compatible with Pydraul E Fluids are necessary for dynamic or moving seals. For static seals they are preferred but not essential. The following table indicates materials recommended, depending on the Pydraul E fluid selected.

	Pydraul 10E	Pydraul 29E LT
Butyl	R	R
EPR	R	R
Viton	U	S
Teflon	R	R
Silicone	S	R
Buna N	U	U
Neoprene	U	U
Natural Rubber	U	U
Nylon	R	R

R - Recommended
S - Satisfactory
U - Unsatisfactory

Paints

Cured epoxy, phenolic, polyurethane and nylon based paints are satisfactory for use with the Pydraul E Series Fluids. Interior surfaces are preferred unpainted.

Other Fluids

Pydraul E Series Fluids are miscible in all proportions with each other and with non-Monsanto phosphate ester fluids. They are essentially insoluble in water.

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The following table gives the inter-compatibility of the Pydraul Fluids:

	Pydraul 10E	Pydraul 29E LT
Pydraul 60	Yes	Yes
Pydraul 150A	No	Yes
Pydraul F9A	Yes	Yes
Pydraul A200B	Yes	Yes
Pydraul 625A	Yes	Yes
Pydraul ACA	Yes	Yes
Pydraul ACA/WG	Yes	Yes

The Pydraul E Series, like other phosphate ester fluids, may give some separation when mixed with Pydraul 135A, 230A, 312A or 540B. Please see your Monsanto representative for specific recommendations on conversion procedures.

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Toxicity and Safe Handling

Animal studies indicate that the low temperature Pydraul E Series Fluids can be classed as practically non-toxic when considered as an industrial fluid. They are non-irritating when the skin is exposed to the fluid.

In case of skin contact wash off with soap and water as a hygienic procedure. In the case of eye contact flush with copious amounts of water.

Due to their low order of toxicity, the low temperature Pydraul E Series require no special handling precautions.

REH/pep 3/3/72

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