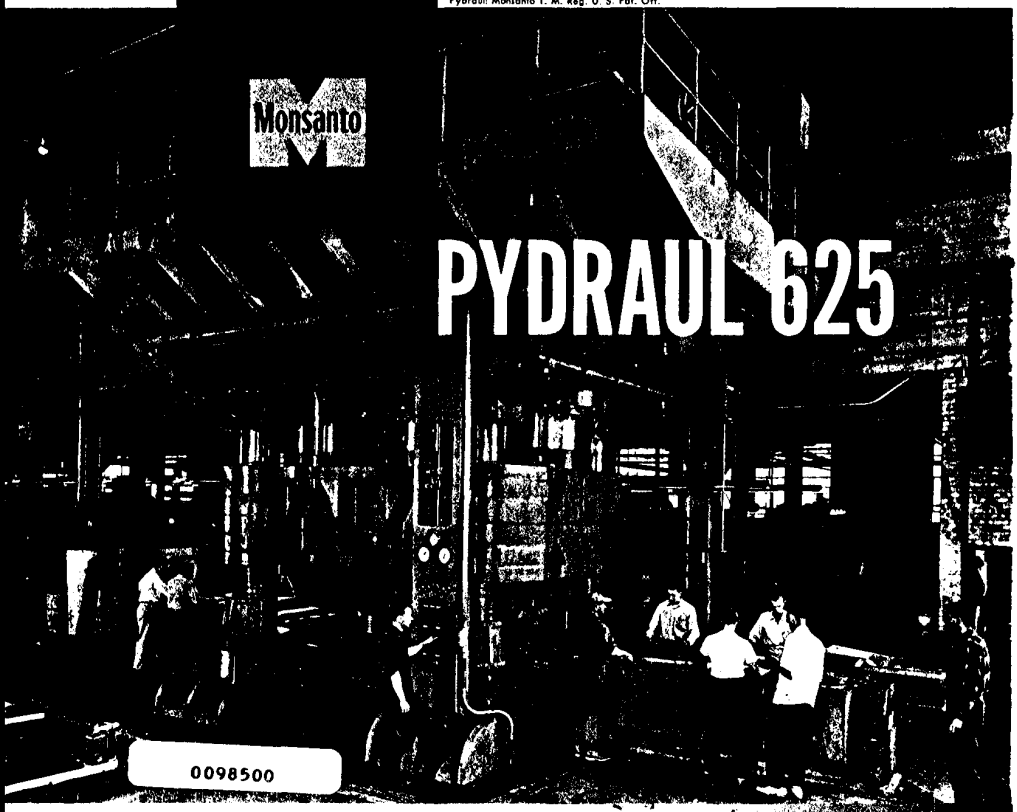
high-viscosity fire-resistant hydraulic fluid for heavy-duty applications

Monsanto developed Pydraul* 625 to fill industry's need for a fire-resistant hydraulic fluid for very-heavy-duty hydraulic applications, such as large industrial presses or heavy-duty pumps requiring high-viscosity hydraulic fluid. You can use Pydraul 625 for fire safety in any equipment that would require an 800 to 1000 SUS oil.

Pydraul 625 has all the good performance characteristics that have won Pydraul fluids the reputation of quality and dependability throughout industry. In years of industrial field use, Pydraul 625 has proven to be a top-grade lubricant that you can depend on for trouble-free operation.

*Pydraul: Monsanto T. M. Reg. U. S. Pat. Off.



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Pydraul 625—like all Pydraul fluids—has built-in, permanent fire resistance . . . no water to evaporate and leave a flammable residue. Pydraul 625 passes all the important ignition tests for fire resistance as shown by the test results below:

HIGH-PRESSURE IGNITION TESTS (AMS-3150B, 4.9.3.2, and MIL-F-7100). Pydraul 625 sprayed through a small orifice at 1000 psi, passing through the flame of an oxyacetylene torch, 6000°F.

FLUID DID NOT FLASH OR IGNITE

LOW-PRESSURE SPRAY TESTS (AMS-3150B). Pydraul 625 sprayed through an orifice at low pressure, the mist passing over an ignited, oil-soaked rag.

VERY SLIGHT BRIGHTENING OF FLAME

MOLTEN-METAL IGNITION TEST. Pydraul 625 exposed to the surface of an aluminum alloy at 1150° to 1200° F.

FLUID DID NOT FLASH OR IGNITE

HOT-MANIFOLD TEST (MIL-F-7100). Pydraul 625 poured on the surface of a manifold, 1300° F.

FLUID DID NOT FLASH OR IGNITE

In all these tests, a comparable-weight petroleum oil flashed and burned readily with self-sustaining flames.

PYDRAUL 625 *has preventive maintenance properties . . .*

Pydraul 625 gives you double-action fire safety *plus* preventive-maintenance properties that mean reliable performance. Pydraul 625 lubricates like a top-grade petroleum oil . . . has high film strength and antiwear properties to protect your equipment . . . and greater oxidative stability. Pydraul 625 has compiled an outstanding record in heavy-duty applications—requires fewer maintenance tasks than other commercial fluids offered for the same applications. No fire-resistant fluid can match its fine performance record in heavy equipment.

In addition to top lubricity, Pydraul 625 offers these other preventive-maintenance features:

NONRUSTING

Pydraul 625 does not cause rusting of system components, does not lose antirust properties with use.

STABLE

Pydraul 625 doesn't wear out . . . does not thicken or thin out with use, form sludge or lose lubricity. Pydraul 625 is designed to be permanent for years of continuous use.

RUGGED

Pydraul 625 is rugged, withstands stresses of heavy duty operation without losing its stability. Users state that Pydraul 625 doesn't require constant watching . . . provides as trouble-free service as any heavy-duty lubricant they've seen.

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PYDRAUL 625 *is an excellent lubricant . . .*

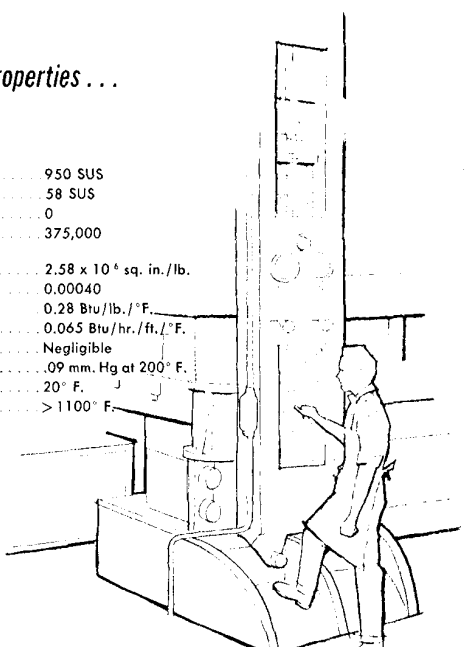
Timken Load (Passing)	55 lbs., 20,000 psi			
Almen Wear	2.2 mg at 4000 psi			
	Steel-on-Steel		Steel-on-Bronze	
Shell Four-Ball	10 Kg.	40 Kg.	10 Kg.	40 Kg.
(167° F., 1 hr., 630 rpm: mm. scar)	0.24	0.72	1.10	1.19

PYDRAUL 625 *specifications . . .*

Appearance	Clear, yellow liquid free of sediment
Specific Gravity, 25°/25°C.	1.340 — 1.370
Neutralization number	Acid, 0.15 maximum
Moisture	0.15% maximum

PYDRAUL 625 *typical properties . . .*

Viscosity (See curve next page.)	
100° F.	950 SUS
210° F.	58 SUS
Viscosity Index	0
Bulk modulus (Room Temp., 1000-6000 psi)	375,000
Compressibility	2.58 x 10^{-6} sq. in./lb.
Coefficient of thermal expansion, per °F.	0.00040
Specific heat, 77° F. (25°C.)	0.28 Btu/lb./°F.
Thermal conductivity	0.065 Btu/hr./ft./°F.
Solubility in water	Negligible
Vapor pressure	.09 mm. Hg at 200° F.
Pour point	20° F.
Autoignition point	> 1100° F.



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Organic Chemicals Division - St. Louis 66, Mo.

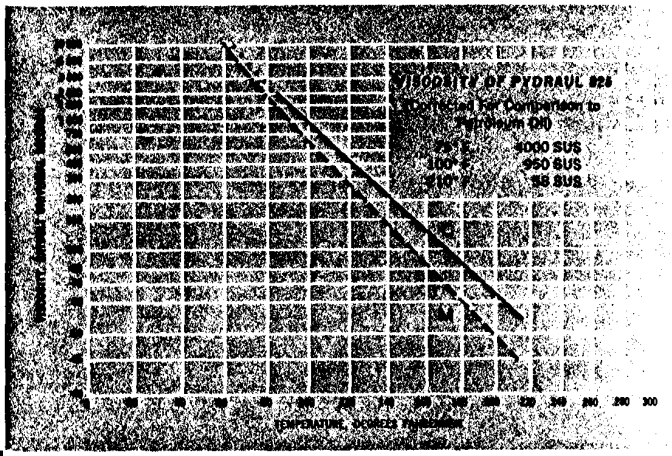
Monsanto

Monsanto Chemical Company

viscosity

Laboratory viscosity measurements are affected by fluid density. Because all petroleum oils have similar densities, their measured viscosities can be compared. The densities of synthetic fluids vary, however, so the measured viscosities must be corrected in order to compare them.

In the graph below, curve "M" is the laboratory-measured viscosity of Pydraul 625. Curve "C" shows the viscosity-temperature relationship modified for the differences in density of oil and Pydraul 625. By comparing curve "C" with a viscosity curve of a heavy-weight-petroleum hydraulic oil, you can see that the two are essentially equivalent at normal operating temperatures.



handling and storage

Animal toxicity studies and human experience indicate that the Pydraul fluids may be used safely if a few reasonable precautions are taken. Repeated or prolonged skin contact should be avoided since the fluids are excellent solvents for the normal skin oils. When splashed or sprayed into the eyes, the Pydraul fluids cause painful smarting. There is no evidence, however, of any permanent eye injury. In the event of accidental contact with the eyes, the eyes should be flushed with plenty of water for 15 minutes and the workman referred to a physician. Physicians have used a 1% pontocaine solution and ophthalmic cortisone acetate solution to relieve irritation.

Respiratory protection or mechanical exhaust ventilation should be provided if there is repeated and prolonged contact of the fluid with heated surfaces with resulting volatilization or possible decomposition of the fluid. For short periods, such as might arise in turning off equipment following the rupture of hydraulic lines or other mechanical failure, no such protection is necessary. Toxicity studies demonstrate that the Pydraul fluids are generally comparable to petroleum-based hydraulic fluids with respect to short-term massive exposures. The details of animal toxicity studies are available from Monsanto's Medical Department.

Pydraul 625 can be stored at sub-zero or high temperatures without freezing or heat damage to the fluid. Drums stored outside should be tightly sealed to prevent entry of moisture. Inside or sheltered storage is preferred.

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