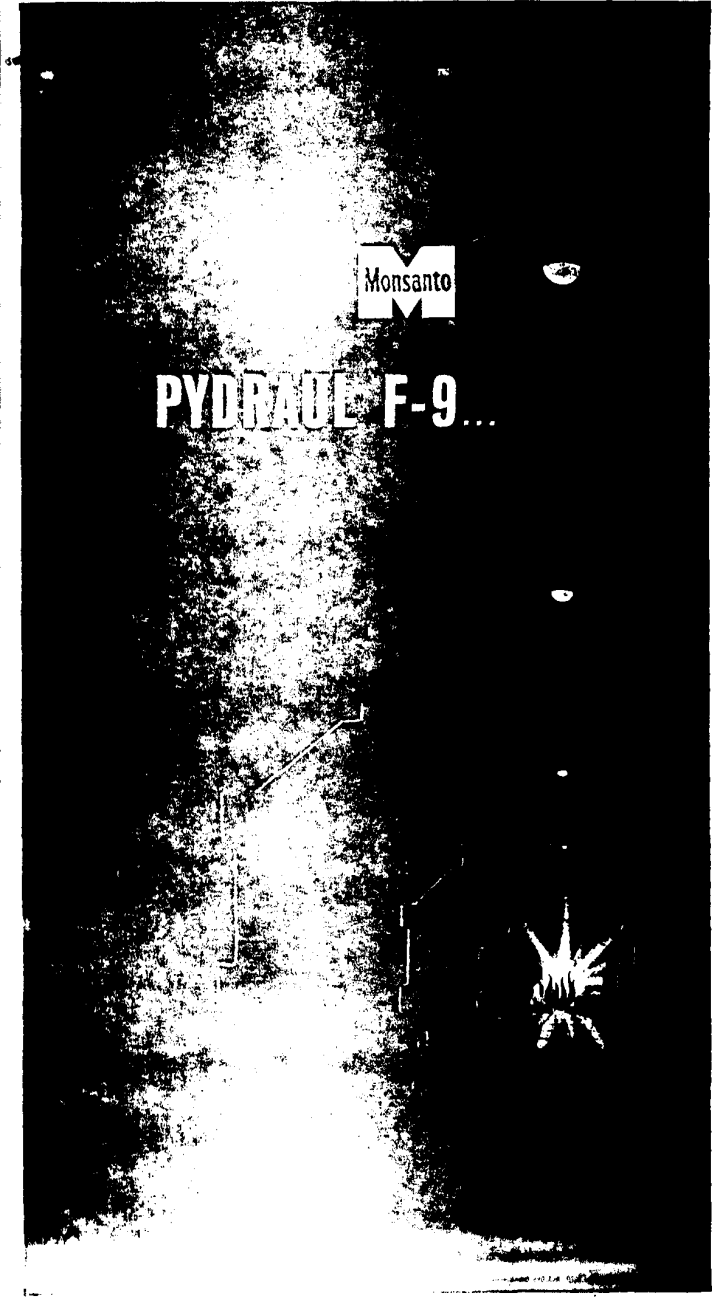




Monsanto

PYDRAUL F-9...

***tailor-made
straight synthetic
fire-resistant
hydraulic fluid***

After a successful test program, Monsanto introduced Pydraul F-9 in 1951 as industry's first tailor-made straight synthetic fire-resistant hydraulic fluid. Pydraul F-9 rapidly became the standard against which all other synthetic hydraulic fluids were judged; today, Pydraul F-9 is still considered the basis for comparison.

Most of the 500,000,000 machine hours Pydraul fluids have served industry have been accumulated on Pydraul F-9. Pydraul F-9 is now in use in every major type of die-casting machine plus a wide variety of other types of equipment found in the metal-working industry. Pydraul F-9 is the most performance-proven fire-resistant fluid now in use in industrial applications.

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*Pydraul, Monsanto trademark. Reg. U.S. Pat. Off.

PYDRAUL F-9 HAS DOUBLE-ACTION FIRE RESISTANCE...

Pydraul F-9 protects equipment and personnel in the event of contact with ignition sources and remains fire resistant in use . . . contains no water to evaporate and leave a flammable residue. During its long use by industry, Pydraul F-9 has been accidentally discharged over molten metal, red-hot ingots, fires, open flames and sparks . . . without causing fire. Pydraul F-9 has never caused or contributed to hydraulic fire in any type of equipment. Pydraul F-9 is the only fire-resistant hydraulic fluid to be listed by Underwriter's Laboratories.

Here are the results of the important laboratory tests for fire resistance:

HOT MANIFOLD TEST (per MIL-F-7100) Pydraul F-9 exposed to the surface of a manifold, 1300° F.	FLUID DID NOT FLASH OR IGNITE
HIGH-PRESSURE IGNITION TEST (AMS-3150B, 48.32, and MIL-F-7100) Pydraul F-9 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 TEST (AMS-3150B) Pydraul F-9 sprayed through an orifice at low pressure, the mist passing over an ignited oil-soaked rag.	FLUID DID NOT INCREASE INTENSITY OF FLAME
MOLTEN METAL IGNITION TEST Pydraul F-9 poured on the surface of a molten alloy, exceeding 1100° F.	FLUID DID NOT FLASH OR IGNITE

PYDRAUL F-9 IS PERFORMANCE PROVEN...

Pydraul F-9 has compiled an excellent performance record in a wide variety of equipment in many industries. This list shows typical applications.

DIECASTING MACHINES
HYDRAULIC PRESSES
FURNACE TILTERS
FURNACE-DOOR OPENERS
INGOT LOADERS
ROTARY FURNACES

MOLTEN-SALT BATHS
EXTRUSION PRESSES
FORGES
PLATING MACHINES
PERMANENT MOLD CASTING

ELECTRIC FURNACES
ELEVATORS AND HOISTS
SCARFERS
STAMPERS
HYDRAULIC JIGS

Its unique combination of properties recommend Pydraul F-9 for uses even more diversified than the current applications in which it has proved so successful.

PYDRAUL F-9 HAS PREVENTIVE-MAINTENANCE PROPERTIES...

Pydraul F-9 is known throughout industry for its quality and dependability . . . wherever machines have been converted from water based fluid to Pydraul F-9, users report maintenance tasks drop off sharply. The reason is this: Pydraul F-9 was especially designed to give the excellent performance of a premium petroleum oil with the added protection of fire resistance. These properties of Pydraul F-9 make it a true preventive-maintenance fluid . . .

OUTSTANDING STABILITY	Pydraul F-9 doesn't wear out in use. Systems have operated on Pydraul F-9 since it was introduced in 1951 without a single fluid change . . . you don't have to inspect it monthly or plan any fluid changes other than normal make-up requirements.
PREMIUM LUBRICITY	Pydraul F-9 has exceptional film strength and load-carrying capacity. In this respect, it outperforms even the best petroleum oils. Parts show very little wear when operated on Pydraul F-9.
GOOD ANTIRUST PROPERTIES	Pydraul F-9 does not cause rusting of metals, does not lose antirust properties with use.
NONTHICKENING	Pydraul F-9 does not thicken or form sludge with use. Pydraul F-9 systems run cleaner than even those on premium petroleum oil.

HYDRAULIC FLUIDS

Timken Load (Passing) 45 lbs., 18,000 psi
 Asten Wear 2.0 mg. at 4000 psi
 Asten Load 48 lbs., 25,000 psi

Steel-on-Steel	Steel-on-Bronze
10 Kg. 40 Kg.	10 Kg. 40 Kg.
0.28 0.62	1.18 1.28

HYDRAULIC SPECIFICATIONS

Cloudy liquid
 1.270 - 1.300
 Add 0.18
 0.20%

HYDRAULIC TYPICAL PROPERTIES

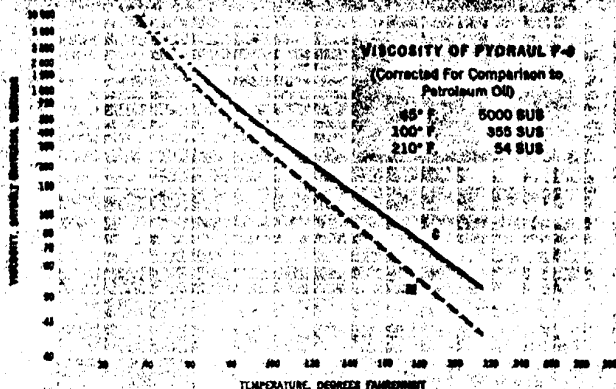
- Viscosity
- Compressibility
- Specific heat
- Thermal stability
- Pour point
- Cloudiness

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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 F-9. "C" shows the viscosity-temperature relationship modified for the differences in density of oil and Pydraul F-9. By comparing curve "C" with a viscosity curve of a medium-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% penicillin 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 F-9 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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