**Technical Data Sheet**
Version 1.0_25.01.2017

# PETRONAS HYDRAULIC FP

## Premium Performance Synthetic Phosphate Ester Fire Resistant Hydraulic Fluid

HYDRAULIC FP is a self-extinguishing, non-aqueous hydraulic fluid that is extremely difficult to ignite and does not support its own combustion. This self-extinguishing property exceeds the limits established for "Less Hazardous Hydraulic Fluids" and incorporates phosphate esters' unique true self-extinguishing property.

HYDRAULIC FP offers good fire-resistance plus the excellent lubricity necessary for heavily loaded bearings.

HYDRAULIC FP is widely used in critical hydraulic equipment found in die-casting, steel mills, forging shops, foundries, glass, ceramic factory and other applications where potential fire hazard is found and a HR-D fluid is recommended. Critical equipment should use this self-extinguishing fluid to get the highest level of protection from leaking fluid fires.

| Superior Fire-Resistance Properties | FP 46 | PAO | Polyol Ester | Mineral Oil |
|---|---|---|---|---|
| Flash Point, ºC | 246 | 235 | 313 | 216 |
| Fire Point, ºC | 357 | 277 | 357 | 240 |
| Auto-Ignition Point, ºC | 565 | 388 | 413 | 316 |
| Heat of Combustion, kBTU/lb | 13.3 | 17.2 | 17.1 | 17.3 |
| Burning after Heat Source Removal | No | Yes | Yes | Yes |

## Applications

HYDRAULIC FP is stable up to operation temperatures of about 80°C (175°F). The normal operating temperature should be above 45°C (113°F) to 55°C (131°F).

In case of low environmental temperatures, HYDRAULIC FP maybe pre-heated (not more than 1 W/cm2 heat-flow) to avoid starting problems of the hydraulic due to too high viscosity.

HYDRAULIC FP is stable in long-time storage; if frozen, it can be thawed and used without harm. If petroleum oil contamination is more than 3-5%, this will reduce the fire-resistance significantly.

## Features and Benefits

- Self extinguishing fire-resistant properties
- Superior oxidation and thermal stability
- Good hydrolytic stability
- Excellent lubrication properties
- Biodegradable fluids.

## Typical Properties

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| Characteristic | Value |
|---|---|
| Color | Clear amber liquid |
| Specific Gravity, g/ml | 1.15 |
| Viscosity @40°C, cSt | 46 |
| Viscosity @100°C, cSt | 5.0 |
| Pour Point, °C | 0 |
| Boiling Point (°C @ 760 mmHG) | 416 |
| TAN, mg KOH/g | 0.03 |
| ASTM Rust Test, Procedure A | Passed |
| | |
| **Engineering Design Data:** | |
| | |
| Evaporation Loss, wt. % (22 hrs @149°C) | 1.5 |
| Coefficient of Thermal Expansion @37.8°C (ml/ml/°C) | 0.0003 |
| Thermal Conductivity @ 25°C (btu/hr/ft2/°C/ft) | 0.0706 |
| Surface Tension (dynes/cm) @ 20°C | 42 |
| Refractive Index @ 20°C | 1.551 |
| Heat of Combustion (btu/lb) | 13, 459 |
| Specific Heat (btu/lb/°C)<br>@37.8ºC<br>@149ºC | <br>0.376<br>0.442 |
| | |
| Performance Data | |
| Shell 4-Ball Test | |
| 1 kg load, Scar dia. mm, avg. | 0.20 |
| 40 kg load, Scar dia. mm, avg. | 0.54 |

All technical data is provided for reference only and all specification based on ISO 12922
**Individual limits accordingly with each viscosity grade / (1): not required in specification / SS is available upon request including quality control limits

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## Compatibility

HYDRAULIC FP has no effect on metals if the fluid is kept in good storage condition, i.e. the TAN may not exceed the limit of 1.0 mg KOH/g of new HYDRAULIC FP .

It is compatible with Viton and butyl rubber seals but not neoprene or "BunaN" (NBR) seals.

### Packaging

In 209 Liters Drum

### Customer Advice

For further assistance on product MSDS, recommendation or technical queries, please liaise with the regional technical services engineer or contact HQ technical engineers.

### Important Note

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