

# PETRONAS HYDRAULIC FR SERIES

## Premium Performance Fire Resistant Hydraulic Fluid – HFD-U

PETRONAS Hydraulic FR Series are premium performance, fire resistant, anti-wear hydraulic fluids specially developed for industrial hydraulic equipment operating under normal to heavy duty conditions, recommended whenever a major fire hazard exists associated with industrial hydraulic systems.

Formulated with high viscosity index synthetic ester base oil enhanced with advanced anti-wear, anti-oxidant, anti-rust and anti-foam additives, PETRONAS Hydraulic FR fluids provide high anti-wear protection, smooth operation of the hydraulic systems and contribute to mitigate the risks of violent explosions or fire in the immediate vicinity of flames or hot metal surfaces.

### Applications

PETRONAS Hydraulic FR Series are recommended for use in:

- various industrial and mobile hydraulic systems operating under high temperatures where a major fire hazard exists such as steel mills, blast furnaces, continuous casting machine and coke plants

### Features and Benefits

Features	Benefits
Excellent Fire resistance / High temperature applications	Reduces risk of fire in high temperature and close to open flame applications, which can ensure safer working environment
High Viscosity Index	Ensures superior performance and protection over a wide temperature range
High anti-wear protection	Protects equipment components from excessive wear and provides long equipment life
Very good thermal and oxidation stability	Maintains performance levels under high temperatures and pressure, in specific application where this type of product is recommended
High rust & corrosion protection	Inhibits the corrosion process that occurs in presence of water, improving equipment life
Very good water separability	Due to good water separability the system is protected from water degenerative effects, maintaining hydraulic system efficiency at required level and reducing maintenance costs
Very good air release	Maintains good efficiency in hydraulic systems, ensures smooth operation due to fast air release. Protects the system from air degenerative effects reducing maintenance costs
High multi metal compatibility	Compatible with most metal alloys ensuring trouble free performance of the system

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### Typical Properties

Characteristic	Method	Specification	46	68
Specific Gravity @15°C	ASTM D 4052	(1)	0,926	0,934
Kinematic Viscosity at 40 °C, cSt	ASTM D 445	±10%	46	68
Kinematic Viscosity at 100 °C, cSt	ASTM D 445	(1)	8,8	12,0
Viscosity Index	ASTM D 2270	(1)	174	175
Flash Point, °C	ASTM D 92	(1)	300	300
Manifold Ignition test, °C	ISO 20823	(1)	450	450
Pour Point, °C	ASTM D 97	(1)	-30	-27
TAN, mgKOH/g	ASTM D 974	Report	1,4	1,2
Water Separability, 40/37/3 - mins	ASTM D 1401	(1)	30	30
Copper Strip Corrosion	ASTM D 130	Report	1a	1a
Foam Sequence I, mL	ASTM D 892	Max. 300/10	30/0	30/0
Foam Sequence II, mL		Max. 300/10	0/0	0/0
Foam Sequence III, mL		Max. 300/10	30/0	30/0
FZG, Stages Passed	ISO 14635-1	-	>12	>12
Air Release, min	ASTM D 3427	**	5	10
Corrosion Protection	ISO 4404-2	Max. 3	Pass	Pass

All technical data are 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

### Performance Levels

- Factory Mutual Approval (ISO VG 68 - PR460598)
- HFD-U Fluid

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## Health, Safety and Environment

This product is unlikely to present any significant health and safety hazards when used in the recommended application. Avoid contact with skin. Wash immediately with soap and water after skin contact. Do not discharge into drains, soil or water.

For further detail regarding storage, safe handling, and disposal of product, please refer to product SDS or contact us at: [www.pli-petronas.com](http://www.pli-petronas.com).

## Important Note

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