

# PETRONAS HYDRAULIC UF SERIES

## Premium Performance Anti-wear Hydraulic Fluids

PETRONAS Hydraulic Ultra Filtration Series are premium performance anti-wear hydraulic fluids specially developed for a wide range of mobile and industrial hydraulic equipment operating under normal to heavy duty conditions with high level of cleanliness control.

Formulated with high quality selected base oils enhanced with advanced anti-wear, anti-oxidant, anti-rust and anti-foam additives, PETRONAS Hydraulic fluids provide high anti-wear protection, high level of cleanliness control, smooth operation of the hydraulic system and up to 3x longer lasting performance\*.

PETRONAS Hydraulic UF Series meet or exceed key industrial specifications and OEM requirements.

\*vs. minimum requirements of ISO 11158 HM for anti-wear hydraulic fluids based on TOST (ASTM D943)

### Applications

PETRONAS Hydraulic UF Series are recommended for use in:

- various mobile hydraulic and industrial hydraulic systems operating under normal to heavy duty conditions
- hydraulic systems demanding high quality anti-wear fluids and control system equipped with fine filtration systems

Conditionally they may also be used in circulation, splash, bath and ring oiling systems feeding lubricant to gears and bearings. However please consult our local Technical Service Team and/or OEM manual before application.

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### Features and Benefits

Features	Benefits
High cleanliness control	Provides high cleanliness control for systems with very fine tolerances improving equipment accuracy and life
Low temperature protection	Ensures proper protection of equipment components during cold starts
High anti-wear protection	Protects equipment components from excessive wear and provides long equipment life
High wet and dry filterability	Maintains high filter efficiency without giving rise to undue pressure drop, thus increasing filter lifetime
High thermal and oxidation stability	Maintains performance levels under high temperatures and pressure, enabling long oil drain intervals
High rust & corrosion protection	Inhibits the corrosion process that occurs in presence of water, improving equipment life
High water separability	Due to high water separability, the system is protected from water degenerative effects, maintaining hydraulic system efficiency at required level and reducing maintenance costs
High air release and foam stability	Maintains high 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
High compatibility with most seal and elastomers	Compatible with most seals and elastomers, which prevents oil leaks and contamination due to seal erosion

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### Typical Properties

Characteristic	Method	Specification	10	15	22	32
Specific Gravity @15°C	ASTM D 4052	(1)	0,856	0,860	0,868	0,871
Kinematic Viscosity at 40°C, cSt	ASTM D 445	±10%	10	15	22	32
Kinematic Viscosity at 100°C, cSt	ASTM D 445	**	2,7	3,4	4,3	5,4
Viscosity Index	ASTM D 2270	(1)	108	98	101	102
Flash Point, °C	ASTM D 92	Report	150	150	170	220
Pour Point, °C	ASTM D 97	**	-39	-39	-36	-33
Cleanliness class	ISO 4406	(a)	16/14/11	16/14/11	16/14/11	16/14/11
	NAS 1638		5	5	5	5
FZG, Stages Passed	ISO 14635-1	Min. 10	12	12	12	12
Water Separability, 40/37/3 - mins	ASTM D 1401	**	10	10	10	15
Copper Strip Corrosion	ASTM D 130	Max. 2	1b	1b	1b	1b
TOST life, hours	ASTM D 943	Min. 1000	3900	3900	3900	3900
Foam Sequence I, mL	ASTM D 892	Max. 150/0	0/0	0/0	0/0	0/0
Foam Sequence II, mL		Max. 75/0	0/0	0/0	0/0	0/0
Foam Sequence III, mL		Max. 150/0	0/0	0/0	0/0	0/0
Characteristic	Method	Specification	46	68	100	150
Specific Gravity @15°C	ASTM D 4052	(1)	0,877	0,883	0,886	0,890
Kinematic Viscosity at 40°C, cSt	ASTM D 445	±10%	46	68	100	150
Kinematic Viscosity at 100°C, cSt	ASTM D 445	**	6,8	8,7	11,2	14,7
Viscosity Index	ASTM D 2270	(1)	102	99	97	97
Flash Point, °C	ASTM D 92	Report	220	230	240	240
Pour Point, °C	ASTM D 97	**	-33	-30	-27	-27
Cleanliness class	ISO 4406	(a)	16/14/11	16/14/11	16/14/11	16/14/11
	NAS 1638		5	5	5	5
FZG, Stages Passed	ISO 14635-1	Min. 10	12	12	12	12
Water Separability, 40/37/3 - mins	ASTM D 1401	**	15	15	30	30
Copper Strip Corrosion	ASTM D 130	Max. 2	1b	1b	1b	1b
TOST life, hours	ASTM D 943	Min. 1000	3900	3900	3900	3900
Foam Sequence I, mL	ASTM D 892	Max. 150/0	0/0	0/0	0/0	0/0
Foam Sequence II, mL		Max. 75/0	0/0	0/0	0/0	0/0
Foam Sequence III, mL		Max. 150/0	0/0	0/0	0/0	0/0

All technical data is provided for reference only and all specification based on DIN 51524-2 (2006) and ISO 11158 HM (FDIS 2008)

\*\*Individual limits accordingly with each viscosity grade / (1): not required in specification / SS is available upon request including quality control limits/ (a) The requirements regarding cleanliness will vary from system to system. The delivered values must be agreed. The fact that oil is influenced by numerous factors during transport and storage is to be taken in consideration.

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### Performance Levels

- ASTM D 6158 HM (2005)
- Bosch Rexroth RD90220
- DIN 51524 Part II HLP (2006)
- Eaton 03-401-2010
- Fives Cincinnati P-68/P-69/P-70
- GM LS-2 (2004)
- ISO 11158 HM (FDIS 2008)
- JCMAS HK P041 (2004)
- Parker Denison HF-0, HF-1, HF-2
- SAE MS1004
- SEB 181 222 (2007)
- US Steel 126, 127 and 136

### 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 refers to product SDS or contact us at: [www.pli-petronas.com](http://www.pli-petronas.com)

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