Technical Data Sheet
Revision Date: 10.03.2021

PETRONAS HYDRAULIC ESF SERIES

Supreme Performance Energy Saving Hydraulic Fluids

PETRONAS Hydraulic ESF Series are supreme performance anti-wear hydraulic fluids specially developed to reduce fuel/energy consumption in modern mobile and industrial hydraulic equipment operating under normal to extremely heavy duty conditions including latest high speed and high pressure systems.
Formulated with a unique semi synthetic combination of selected base oils enhanced with high shear stable VI improver and advanced anti-wear, anti-oxidant, anti-rust and anti-foam additives coupled with friction modifiers, PETRONAS Hydraulic ESF fluids provide excellent anti-wear protection, highly stable performance across wider temperature range as compared to normal viscosity index products, up to 5x longer lasting performance* and up to 6% direct reduction in fuel consumption in mobile equipment / up to 10% energy savings in stationary industrial equipment.**

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

*vs. minimum requirements of ISO 11158 HV for anti-wear hydraulic fluids based on TOST (ASTM D943)
** vs. conventional, standard viscosity hydraulic fluids. Actual results may vary depending on different application conditions, type & condition of equipment, current oil used.

Applications

PETRONAS Hydraulic ESF Series are recommended for use in:

- various mobile and industrial hydraulic systems operating under normal to extremely heavy duty conditions that demand good control of fluid viscosity during operating cycle
- modern hydraulic systems using high speed & high pressure pumps and operating under high temperatures
- hydraulic systems subjected to high and/or rapid variations in operating and/or ambient temperatures
- outdoor hydraulic systems operating in cold climates, where high protection is required in subzero temperatures and cold start-ups are frequently encountered
- hydraulic systems where high precision and stable efficiency of the system is required (e.g. moulding machines)
- hydraulic systems with smaller reservoirs & smaller coolers generating high thermal stress on hydraulic fluids
- sensitive to sludge and varnish formation systems with tight tolerance pumps and servo valves
- hydraulic systems demanding long life lubricants

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Features and Benefits

Features	Benefits
Energy saving	Helps to achieve energy costs saving and/or fuel consumption economy of up to 10% and 6% respectively
High Viscosity Index	Ensures superior performance and protection over a wide temperature range
Low temperature protection	Ensures proper protection of equipment components during cold starts
Excellent anti-wear protection	Protects equipment components from excessive wear and provides longer equipment life
Excellent wet and dry filterability	Maintains excellent filter efficiency without giving rise to undue pressure drop, thus increasing filter lifetime
Excellent thermal and oxidation stability	Maintains performance levels under high temperatures and pressure, enabling long oil drain intervals
Excellent rust & corrosion protection	Inhibits the corrosion process that occurs in presence of water, improving equipment life
Excellent water separability	Due to excellent water separability the system is protected from water degenerative effects, maintaining hydraulic system efficiency at required level and reducing maintenance costs
Excellent air release and foam stability	Maintains excellent efficiency in hydraulic systems, ensures smooth operation due to fast air release. Protects the system from air degenerative effects reducing maintenance costs
Excellent multi metal compatibility	Compatible with most metal alloys ensuring trouble free performance of the system
Excellent 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	46	68
Specific Gravity @15°C	ASTM D 4052	(1)	0,867	0,868
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
Viscosity Index	ASTM D 2270	Min. 140	174	175
Flash Point, °C	ASTM D 92	**	220	230
Pour Point, °C	ASTM D 97	**	-33	-30
TAN, mgKOH/g	ASTM D 664	(1)	0,40	0,40
FZG, Stages Passed	ISO 14635-1	Min. 10	10	10
Water Separability, 40/37/3 - mins	ASTM D 1401	**	10	10
Copper Strip Corrosion	ASTM D 130	Max. 2	1a	1a
TOST life, hours	ASTM D 943	Min. 1000	5200	5200
Foam Sequence I, mL	ASTM D 892	Max. 150/0	0/0	0/0
Foam Sequence II, mL		Max. 75/0	0/0	0/0
Foam Sequence III, mL		Max. 150/0	0/0	0/0

All technical data are 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

Performance Levels

- Bosch Rexroth RDE 90220
- DIN 51524 Part II HLP and III HVLP (2006)
- Eaton 03-401-2010
- Eaton Lubricant Specification E-FDGN-TB002-E
- Fives Cincinnati P-68/P-69/P-70
- ISO 11158 HV (FDIS 2008)
- Parker Denison HF0/HF1/HF2

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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

Important Note

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