

PETRONAS GEAR FL SERIES

Premium Performance Heavy Duty Industrial Gear Oil

PETRONAS Gear FL Series are premium performance industrial gear oils specially developed for various types of enclosed industrial gears operating under normal to extremely heavy duty conditions.

Formulated with high quality selected mineral base oils enhanced with advanced extreme pressure, anti-wear, anti-oxidant, anti-rust and anti-foam additives, PETRONAS Gear FL oils provide excellent extreme pressure, anti-wear and micropitting protection, energy saving, reduced bulk oil temperatures, smooth operation of the gear drives and up to 1,6x longer lasting performance*.

PETRONAS Gear FL Series meets or exceeds key industrial specifications and OEM requirements including highly demanding Siemens Flender (Revision 15).

*vs. minimum requirements of industrial gear oils to pass the viscosity increase test (ISO 4263-4 @95°C)

Applications

PETRONAS Gear FL Series are recommended for use in:

- various types of enclosed industrial gears (spur/helical/bevel/planetary) with circulation or splash lubrication systems operating at bulk oil temperature up to 110°C
- gears drives demanding high protection against micropitting
- gears drives subjected to extremely heavy loads
- gears drives sensitives to sludge formation
- non-gear applications include shaft couplings, and heavily loaded plain bearings operating at slow speeds

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Features and Benefits

Features	Benefits
Excellent micropitting resistance	Helps to extend gear and bearing life in gear drives operating under severely loaded conditions
Excellent extreme pressure protection	Excellent extreme pressure performance giving long gear life in severely loaded gear drives
Excellent anti-wear protection	Protects equipment components from excessive wear and provides longer equipment life
Excellent thermal and oxidation stability	Maintains performance levels under high temperatures and pressure, enabling long oil drain intervals
Excellent resistance to sludging	Excellent cleanliness for sludge free gear drives
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 are protected from water degenerative effects, maintaining gear drives efficiency at required level and reducing maintenance costs
Excellent multi metal compatibility	Compatible with most metal alloys ensuring trouble free performance of the system
Excellent seal and elastomer compatibility	Compatible with most seals and elastomers, which prevents oil leaks and contamination due to seal erosion
Excellent paint compatibility	Compatible with most paints in modern gear drives, which ensures gear drives cleanliness and prevents contamination

**Technical Data Sheet**

Version 2.0_26.10.2017

PETRONAS GEAR FL SERIES**Premium Performance Heavy Duty Industrial Gear Oil****Typical Properties**

Characteristic	Method	Specification	150	220	320
Specific Gravity @15°C	ASTM D 4052	Report	0,880	0,880	0,881
Kinematic Viscosity at 40°C, cSt	ASTM D 445	±10%	150	220	320
Kinematic Viscosity at 100°C, cSt	ASTM D 445	(1)	14,7	18,9	23,9
Viscosity Index	ASTM D 2270	Min. 90	97	96	95
Flash Point, °C	ASTM D 92	Min. 200	240	250	250
Pour Point, max °C	ASTM D 97	**	-27	-21	-21
TAN, mgKOH/g	ASTM D 664	Report	0,44	0,47	0,45
Water Separability, 40/37/3 – mins	ASTM D 1401	Max. 30	10	15	15
Copper Strip Corrosion, Visual	ASTM D130	Max. 1	1b	1b	1b
Foam Sequence I, mL	ISO 6427	Max. 100/10	0/0	0/0	0/0
Foam Sequence II, mL		Max. 100/10	0/0	0/0	0/0
Foam Sequence III, mL		Max. 100/10	0/0	0/0	0/0
Weld Load, Kgf	ASTM D2783	(1)	400	400	400
Timken OK Load, lbs	ASTM D2782	(1)	80	80	80
FZG, Stages Passed	ISO 14635-1	Min. 12	>12	>12	>12
FZG Micropitting resistance (90°C)	FVA-54	>10 High	Pass	Pass	Pass
Cincinnati Thermal Stability	CCMC Thermal B	Pass	Pass	Pass	Pass
Characteristic	Method	Specification	460	680	
Specific Gravity @15°C	ASTM D 4052	Report	0,881	0,882	
Kinematic Viscosity at 40°C, cSt	ASTM D 445	±10%	460	680	
Kinematic Viscosity at 100°C, cSt	ASTM D 445	(1)	30,8	42,0	
Viscosity Index	ASTM D 2270	Min. 90	97	103	
Flash Point, °C	ASTM D 92	Min. 200	254	254	
Pour Point, max °C	ASTM D 97	**	-15	-12	
TAN, mgKOH/g	ASTM D 664	Report	0,44	0,45	
Water Separability, 40/37/3 – mins	ASTM D 1401	Max. 30	20	25	
Copper Strip Corrosion, Visual	ASTM D130	Max. 1	1b	1b	
Foam Sequence I, mL	ISO 6427	Max. 100/10	0/0	0/0	
Foam Sequence II, mL		Max. 100/10	0/0	0/0	
Foam Sequence III, mL		Max. 100/10	0/0	0/0	
Weld Load, Kgf	ASTM D2783	(1)	400	400	
Timken OK Load, lbs	ASTM D2782	(1)	80	80	
FZG, Stages Passed	ISO 14635-1	Min. 12	>12	>12	
FZG Micropitting resistance (90°C)	FVA-54	>10 High	Pass	Pass	
Cincinnati Thermal Stability	CCMC Thermal B	Pass	Pass	Pass	

All technical data is provided for reference only and all specification based on DIN 51517-3 and ISO 12925-1

**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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Performance Levels

- AGMA 9005-E02
- David Brown S1.53.101
- DIN 51517 Part III
- Fives Cincinnati Machine Gear
- GM LS 2 EP Gear Oil
- ISO 12925-1 CKC/CKD
- Siemens MD Approval for Flender Gear drives - Revision 15
- U.S. Steel 224

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

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