HENUVAR ADVANCED MATERIALS | TECHNICAL DATA SHEET TDS

UNIRICHLUBE HERO PAG-OG 35

High-Performance Additive Package for PAG Open Gear Lubricants

Extreme-Load Protection. Cooler, More Efficient Gear Operation.

Product Description

UNIRICHLUBE HERO PAG-OG 35 is a mature, field-proven multifunctional additive package developed specifically for high- and ultra-high-viscosity polyalkylene glycol (PAG) open gear lubricants. Its ashless sulfur-phosphorus extreme-pressure and antiwear system is reinforced with copper corrosion inhibitors, metal deactivators and rust protection components. At a recommended treat rate of 3-5 wt%, it provides a robust formulation platform for slow-speed, heavily loaded and shock-loaded open gear drives operating at elevated tooth temperatures.

The additive package and its PAG-based lubricant formulations built around this additive package have been proven over many years in mining aftermarket service, including large open gear drives on ball mills and semi-autogenous grinding (SAG) mills. Field experience demonstrates effective reductions in tooth-surface temperature and face-width temperature variation, together with improved operating efficiency. Long-term inspections have shown low levels of pitting and abnormal wear, confirming stable, sustained protection under severe loads.

Key Benefits

- **Field-Proven in Mining Service**
  Mature technology with years of aftermarket use on heavily loaded mining equipment, supporting consistent formulation and dependable field performance.
- **PAG-Enabled Energy Efficiency and Temperature Reduction**
  Works with low-friction, high-viscosity-index PAG base fluids to reduce meshing losses; in comparable field applications, tooth-surface temperatures have been reduced by approximately 20 °C.
- **Field-Proven Resistance to Pitting and Abnormal Wear**
  The ashless sulfur-phosphorus system rapidly forms a protective film under boundary lubrication and shock loading; field inspections have shown low levels of pitting, scuffing and abnormal wear.
- **Extended Copper Corrosion Control**
  Corrosion inhibition and metal deactivation are tailored to the sulfur-phosphorus EP system, delivering a 1b rating in an extended copper strip corrosion test at 100 °C for 24 h.
- **Clean, Transparent Formulations**
  A solids-free design supports direct tooth inspection and helps reduce deposit risk in spray nozzles, filters and lubricant supply lines.

Recommended Applications

Recommended for formulating high-viscosity, solids-free, solids-free, fluid-type PAG open gear lubricants for ball mills, SAG mills, autogenous grinding (AG) mills, rotary kilns, tube mills, coal mills and other large, slow-speed, heavily loaded girth gear drives. Depending on finished-fluid viscosity, pumpability and equipment requirements, formulations may be used in centralized spray, circulation or manual application systems.

Recommended Treat Rate

Treat Rate (wt%)	Recommended Duty	Application Guidance
3.0%	Standard heavy-duty service	General mining, cement and large girth gear drives
4.0%	Severe heavy-duty service	Recommended balance of load-carrying performance, service life and formulation economics
5.0%	Extreme load and shock service	Higher load-carrying requirements and frequent shock loading

Technical Specifications

Property	Test Method	Technical Specification
Appearance	Visual	Clear, pale yellow liquid
Density at 20 °C, kg/L	ASTM D1298	1.02-1.12
Kinematic Viscosity at 100 °C, mm²/s	ASTM D445	Report

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Flash Point, COC, °C	ASTM D92	≥100
Ash, wt%	ASTM D482	≤0.01

Typical Formulation Performance

The following data are representative of formulations based on HENUVAROX 65W ultra-high-viscosity PAG base fluid at treat rates of 3.0 and 5.0 wt%. They demonstrate typical load-carrying, copper corrosion and viscosity-temperature performance. Actual results may vary with PAG chemistry, blending batch and test conditions.

Property	Test Method	HENUVAROX 65W + 3.0%	HENUVAROX 65W + 5.0%
Base-Fluid KV at 40 °C, mm²/s	ASTM D445	65,000 (reference)	65,000 (reference)
Base-Fluid KV at 100 °C, mm²/s	ASTM D445	6,000 (reference)	6,000 (reference)
Base-Fluid Viscosity Index	ASTM D2270	>420	>420
Extended Copper Strip Corrosion, 100 °C, 24 h	ASTM D130	1b	1b
Four-Ball Weld Load, P_D, N (kgf)	ASTM D2783	6,082 (620)	7,848 (800)
Appearance	Visual	Clear, homogeneous; no separation	Clear, homogeneous; no separation

Base-fluid viscosity values are provided for platform reference only; finished-fluid viscosity shall be confirmed on the actual blend. Typical data are not product specifications.

Energy Efficiency and Temperature Control

UNIRICHLUBE HERO PAG-OG 35 combines high load-carrying protection and friction control with the favorable friction and viscosity-temperature characteristics of high-VI PAG base fluids. Years of mining field experience show that the resulting lubricant system can reduce meshing friction losses, average tooth-surface temperature and face-width temperature variation, while helping to reduce operating vibration and slow lubricant degradation at elevated temperatures. Energy-efficiency and temperature-reduction results depend on equipment load, speed, ambient temperature, lubricant feed rate and the product being replaced; comparisons should be made under equivalent operating conditions.

Blending and Application Guidance

- **Base Fluid Selection**
  Use a water-insoluble or equipment-approved PAG base fluid. PAG chemistry, end-capping and water content may affect solubility and final performance.
- **Blending Procedure**
  Use clean, dry equipment. Warm the PAG base fluid to a suitable flow temperature, add the package slowly and circulate until the blend is clear and homogeneous. Avoid moisture and cross-contamination.
- **Quality Control**
  Control kinematic viscosity, viscosity index, four-ball weld load (PD), copper strip corrosion, wear scar, rust protection, foaming and storage stability to the established finished-fluid standard.
- **System Conversion**
  Compatibility of PAG with mineral oils, PAO and conventional open gear lubricants may be limited. Before changeover, assess residual lubricant, seals, hoses and coatings, and establish an appropriate cleaning, flushing and commissioning procedure.

Packaging

- 180 kg steel drum
- Customized OEM packaging is available

Storage and Handling

Store indoors in the sealed original container. Protect from moisture ingress, direct sunlight and contamination. If outdoor storage is unavoidable, protect containers from rain and standing water. Recommended storage temperature: not above 60 °C. Avoid prolonged exposure to severe cold or rapid temperature fluctuations. Follow first-in, first-out practice and inspect container integrity before use.

Quality and Management Systems

Manufactured under management systems certified to ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 and ISO 50001:2018.

Disclaimer

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