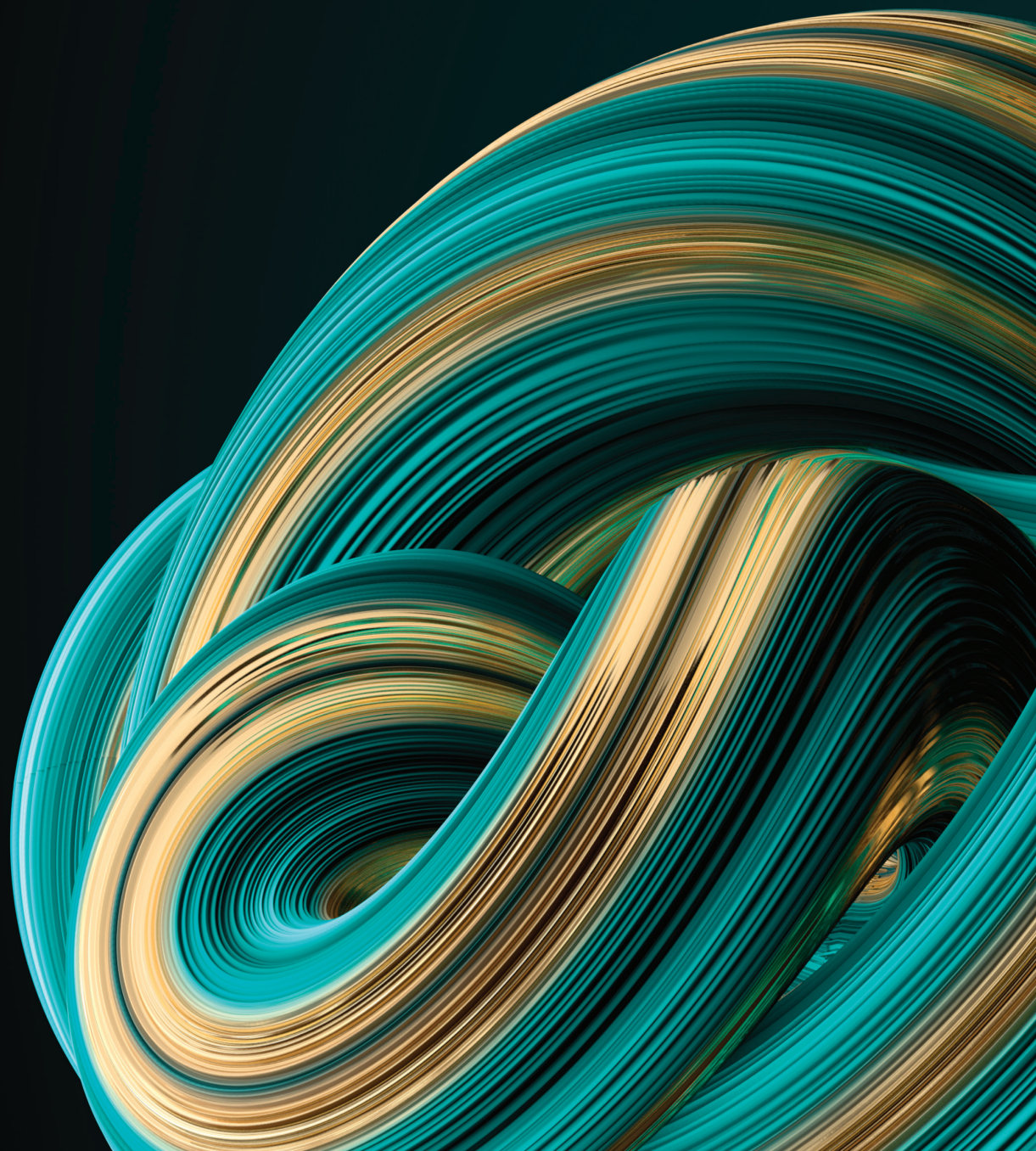




A Subsidiary of PETRONAS Chemicals Group

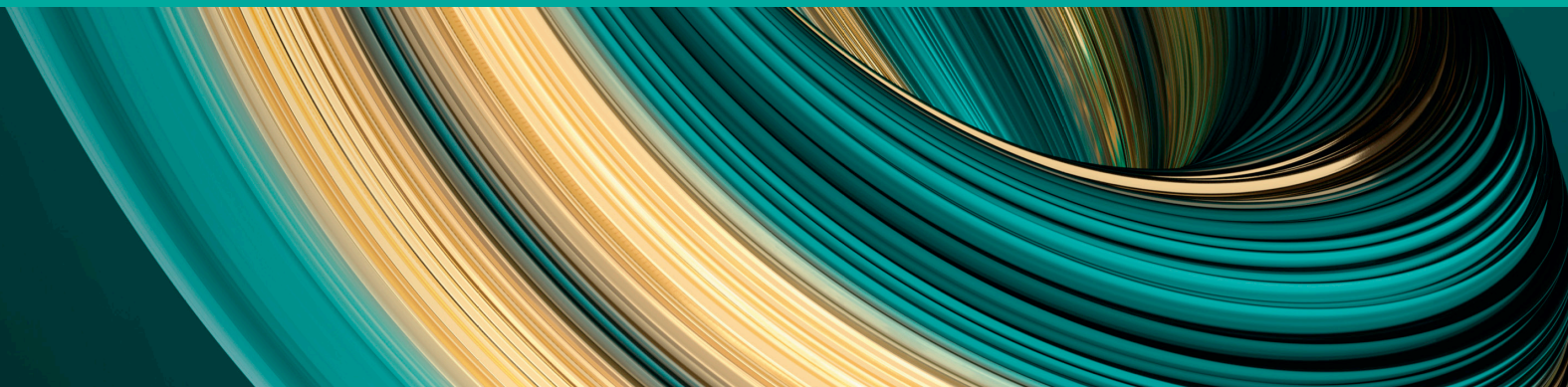
Technology in Motion

Lube Oil Additives
and Chemicals



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Helping Industries Keep Moving Forward

Shaping What's Next

For over 40 years, BRB has helped industries stay ahead through innovation. As part of PETRONAS Chemicals Group, we deliver advanced lubricant additives and specialty chemicals for the automotive, industrial and energy sectors.

Our technologies improve efficiency, extend equipment life, support sustainability and meet evolving performance needs. Through Petrolad® and Viscotech®, BRB helps customers stay ahead of change.



As a subsidiary of PETRONAS, we leverage the strengths of a key player in the lubricants industry



We are agile, flexible and innovative

As a reliable partner, we offer customised product solutions and customer-focused services

Sustainability Through Innovation

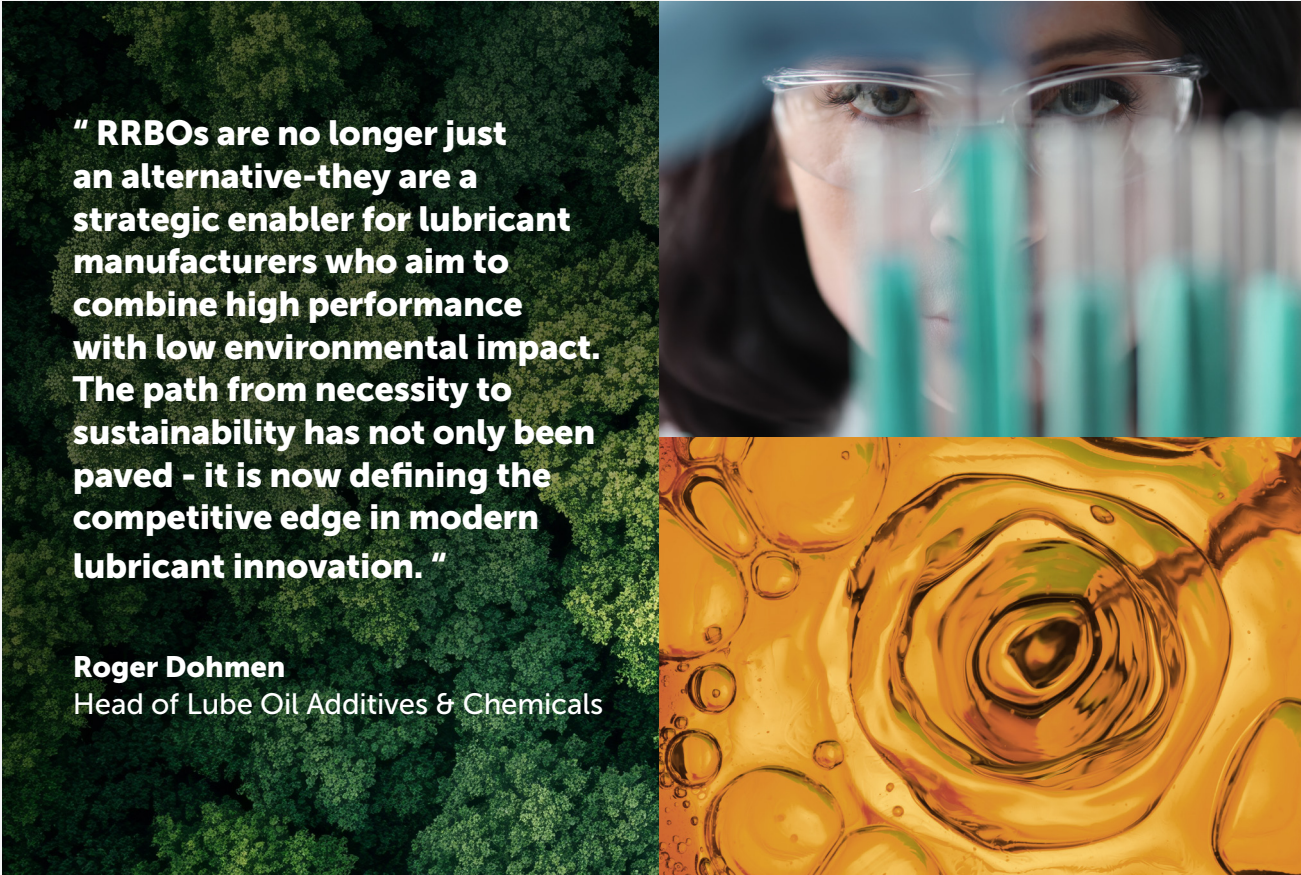
At BRB, sustainability is embedded in how we innovate.

We develop technologies that improve efficiency, extend equipment life and optimise resource use, helping customers achieve both operational and sustainability goals.

This commitment is reflected in the fact that our operations in Echt, the Netherlands have successfully achieved zero greenhouse gas emissions. It is also evident across our portfolio, from low-treat-rate additive technologies that deliver more with less, to Viscotech® upcycled solutions that support the circular economy.

Our high-quality re-refined base oils (RRBOs) are another testament to our pursuit of sustainability. By combining innovations such as these, technical expertise and close customer collaboration, BRB helps customers meet evolving performance, regulatory and sustainability requirements.

Creating technologies that deliver long-term value for our customers, industries and the environment. That's how we define sustainability that keep industries moving forward.



" RRBOs are no longer just an alternative-they are a strategic enabler for lubricant manufacturers who aim to combine high performance with low environmental impact. The path from necessity to sustainability has not only been paved - it is now defining the competitive edge in modern lubricant innovation. "

Roger Dohmen
Head of Lube Oil Additives & Chemicals



Viscotech® **Viscosity Modifiers**

Flowing your way



Viscotech®

Enabling the Next Generation of Lubricant Performance

As lubricant demands grow, formulators need higher performance, greater efficiency and improved sustainability.

Viscotech®, BRB's flagship range of viscosity modifiers, helps meet these challenges across automotive and industrial lubricants. Engineered for real-world conditions, it delivers reliable viscosity control, durability, fuel economy and equipment protection.

The portfolio includes advanced OCP and styrenic technologies for engine oils, gear oils, hydraulic fluids and industrial lubricants. Viscotech® upcycled also supports the circular economy by combining advanced viscosity modifier technology with high-quality re-refined base oils, reducing environmental impact without compromising performance.

From today's vehicles and industrial equipment to future mobility, Viscotech® helps customers develop lubricants that keep industries moving forward.



Viscotech® 6540L

Versatile OCP modifier

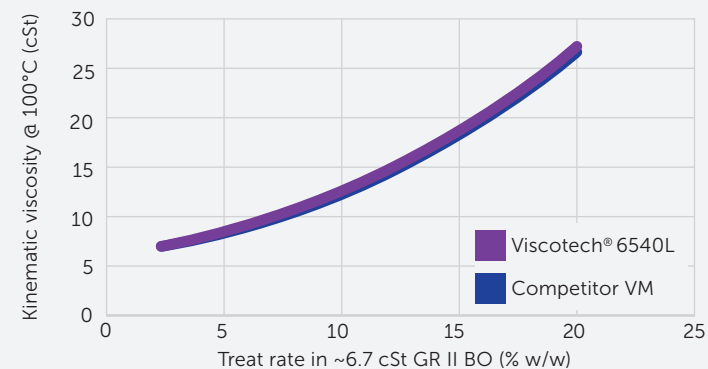
Cost-effectiveness across applications

The advanced OCP viscosity modifiers in the Viscotech® 6-series include a solid variant (6540) and liquid options (6540L) dissolved in GR II virgin base oil. They are designed for use in multi-grade engine oils and industrial lubricants. The versatile additives deliver excellent low-temperature results and can be used with selected pour point depressants (PPDs), such as Petrolad® 7072, in a package solution. In addition, they can be customised to achieve various viscosities that are in high demand.

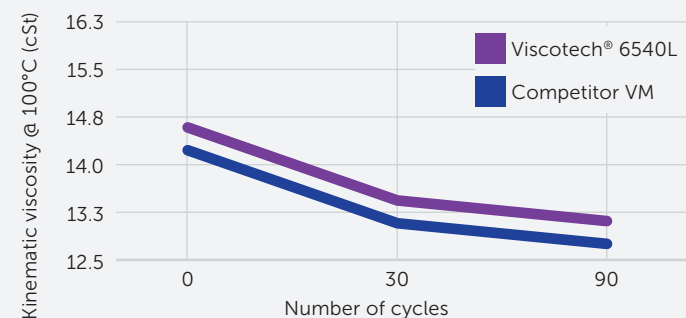
Benefits:

- Excellent low-temperature properties, e.g. in combination with high-paraffin base oils
- Cost-effectiveness thanks to a favourable treat rate and suitability for multiple applications
- Liquid and solid variants show outstanding compatibility with GR I, II and III base stocks

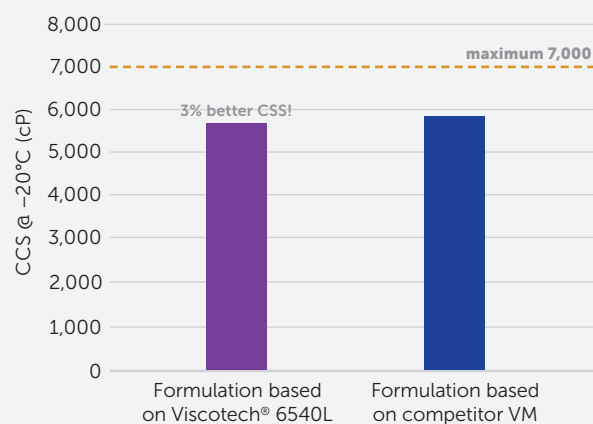
Thickening efficiency of Viscotech® 6540L



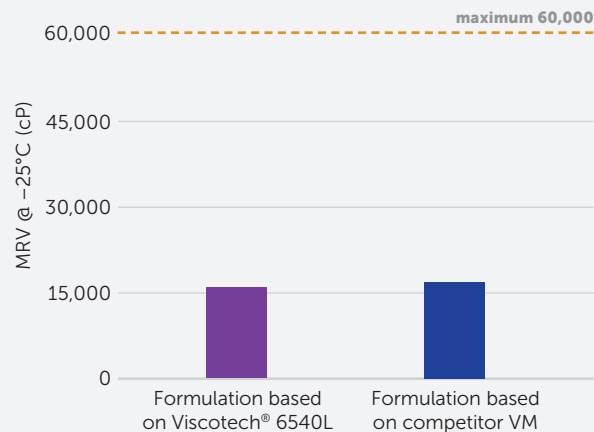
Shear stability performance after 30 and 90 cycles, SAE 15W40, 12.5–16.3 cSt, ASTM D7109



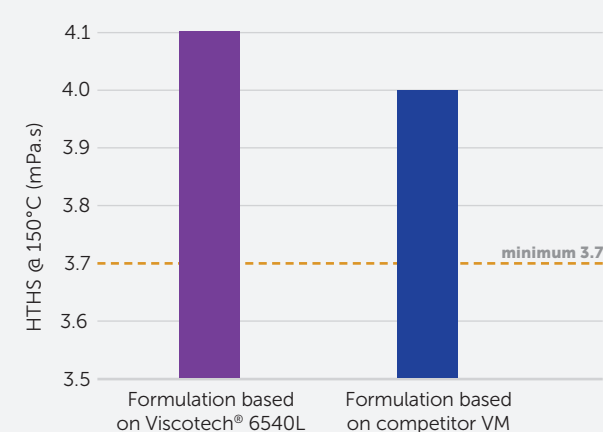
CCS SAE 15W-40, API SL/CF



MRV SAE 15W-40, API SL/CF



HTHS SAE 15W-40, API SL/CF



Viscotech® 6640L

Multi-use OCP viscosity modifier

Versatility and cost-effectiveness

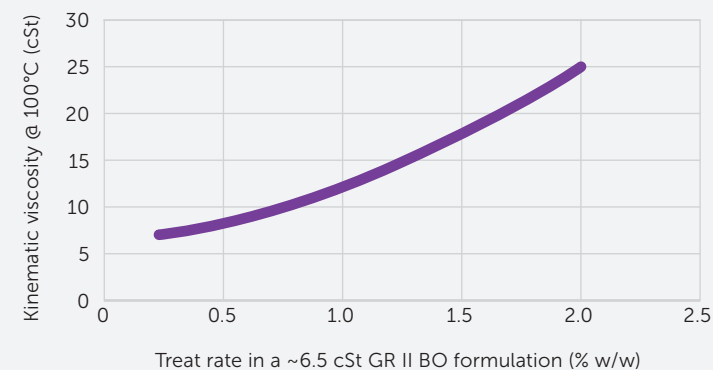
Viscotech® 6640L is a shear-stable (25 SSI) amorphous olefin copolymer (OCP) viscosity index improver, dissolved in an API GR II paraffinic base stock. It can be utilised in various multi-grade crankcase and industrial lubricants, while exhibiting particularly strong performance in mineral PCMO and HDDO blends. Viscotech® 6640L can also be used in combination with our Petrolad® additive technology. Available in fluid or solid form.

Benefits:

- Excellent low-temperature properties in finished fluids (CCS, MRV)
- Cost-effective due to its competitive treat rate and multi-application approach (one source for both)
- For more information, please request the Viscotech® 6640L Technical Report, dedicated to testing SAE 10W-40 (API CI-4) and SAE 5W-30 (API SP) fluids

Our Viscotech® OCP VMs are available from 500 cSt to 1600 cSt, and we can adjust to custom viscosities within this range, according to customers' requests. In addition, all liquid Viscotech® VMs are available in bulk, drums and IBCs.

Thickening efficiency (TE) performance



Viscotech® 494L

Premium styrenic viscosity modifier

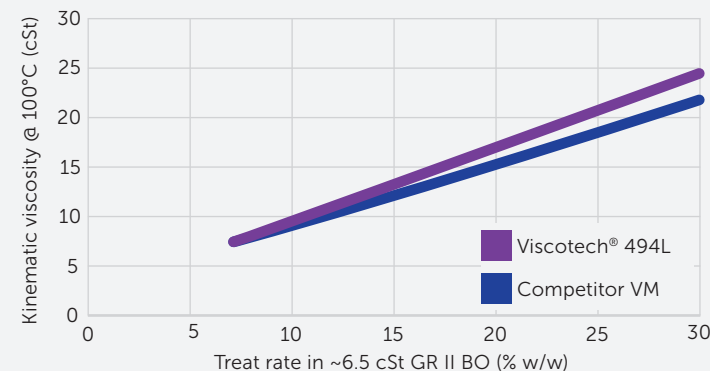
High performance in engine oils

A liquid styrenic solution that offers excellent shear stability (7 SSI) and is dissolved in GR III base oil. Viscotech® 494L is a premium product designed for formulations like top-tier, multi-grade oils to meet the demands of today's top-quality diesel and gasoline engine oils. A proven solution used by many of the largest lubricant manufacturers worldwide, it offers long-term stability coupled with broad thermal coverage.

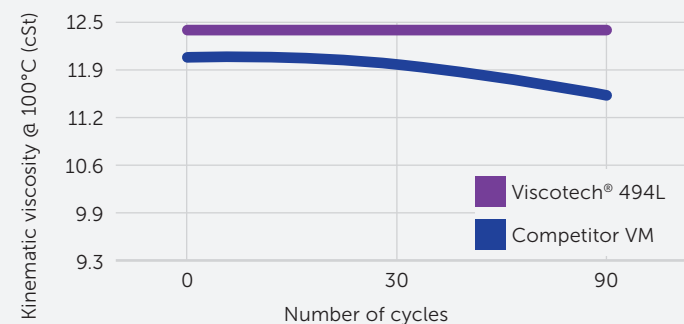
Benefits:

- Excellent SSI for long-term lubricant durability in multi-grade systems
- Outstanding thickening efficiency (TE)
- Enhanced performance at low and high temperatures throughout its service life
- Trusted by major oil blenders

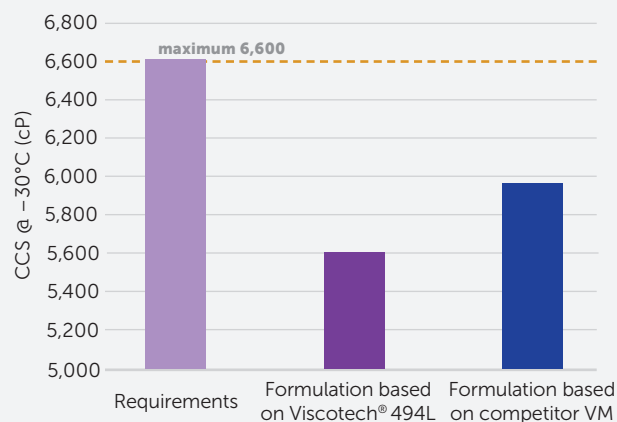
Thickening efficiency of Viscotech® 494L



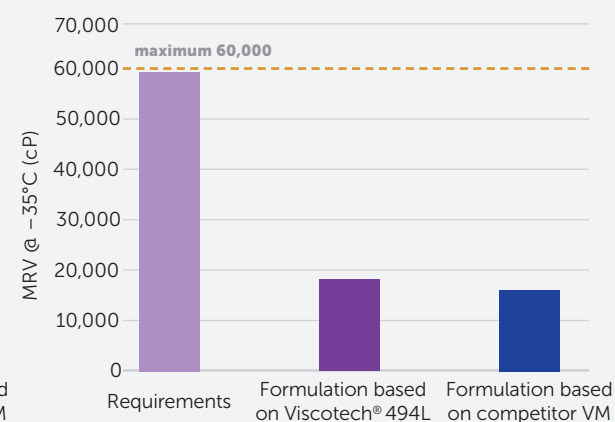
Shear stability performance after 30 and 90 cycles, SAE 5W40, 9.3–12.5 cSt, ASTM D7109



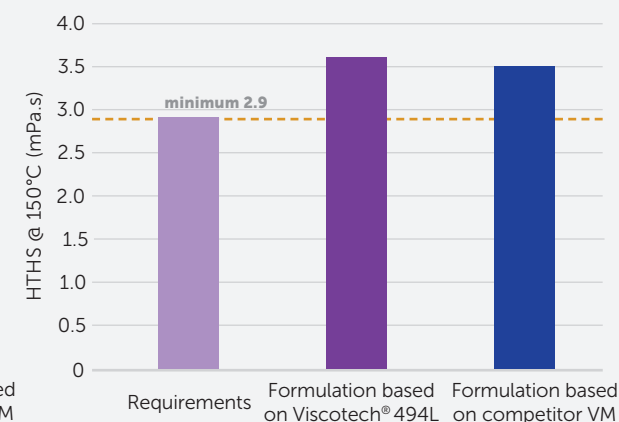
CCS SAE 5W-30



MRV SAE 5W-30, API SM/CF



HTHS SAE 5W-30, API SM/CF



Viscotech® 570

Premium, shear stable viscosity modifier

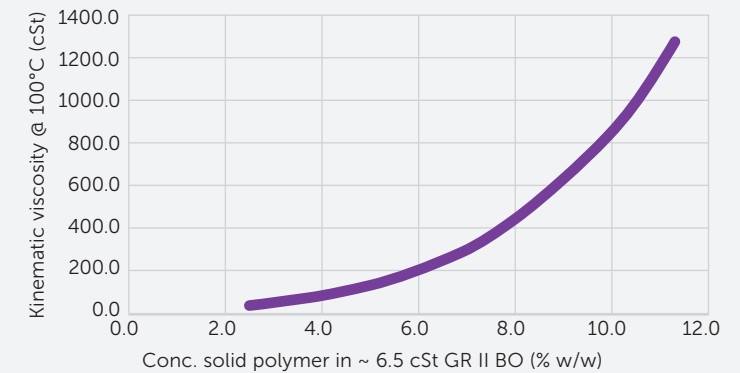
High shear stable performance

The solid VM delivers robust shear stability (8 SSI) as a custom-engineered polymer. Available in easy-to-dissolve powder form, Viscotech® 570 integrates seamlessly into mineral base oil blends. When dissolved in appropriate base stocks, It enables the formulation of high-performance PCMO and HDDO grades, from SAE 5W-30 upward, particularly when combined with select Petrolad® technology. Beyond engine oils, its versatility extends to grease applications, ensuring reliable performance across wide temperature ranges.

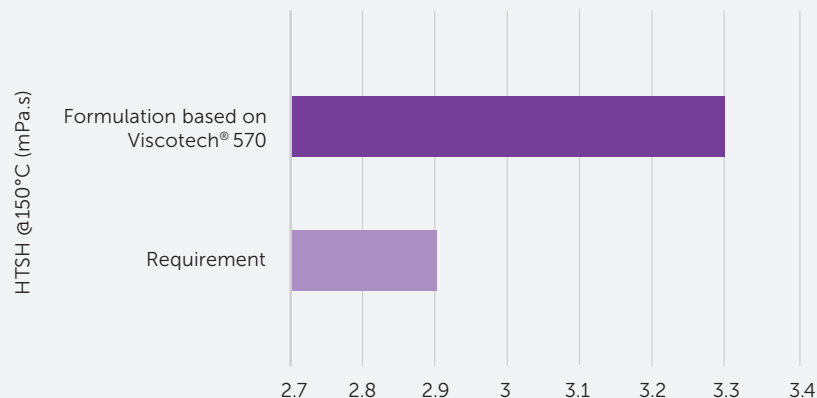
Benefits:

- High thickening efficiency paired with exceptional formulation flexibility.
- Advanced wear prevention enabled by the polymer's high resistance to shear.
- Robust viscosity control under both low-temperature and high-temperature stresses.
- Supplied in powdered form for convenient handling procedure.

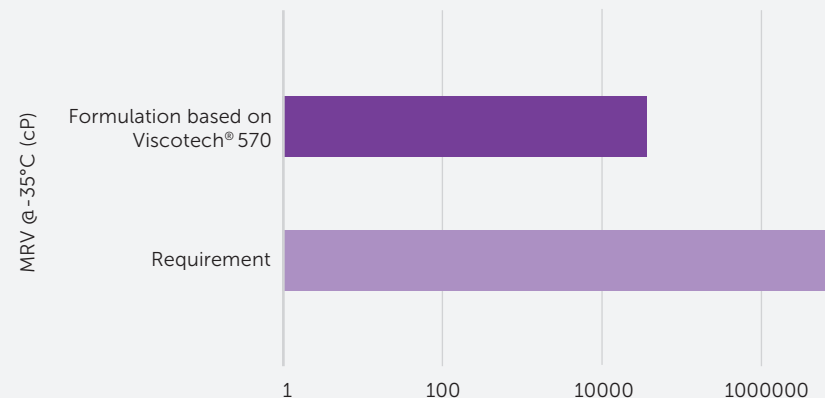
Thickening efficiency of Viscotech® 570



HTHS SAE 5W-40, API SN/CF



MRV SAE 5W-40, API SN/CF





Viscotech® 372L

Innovative viscosity modifier

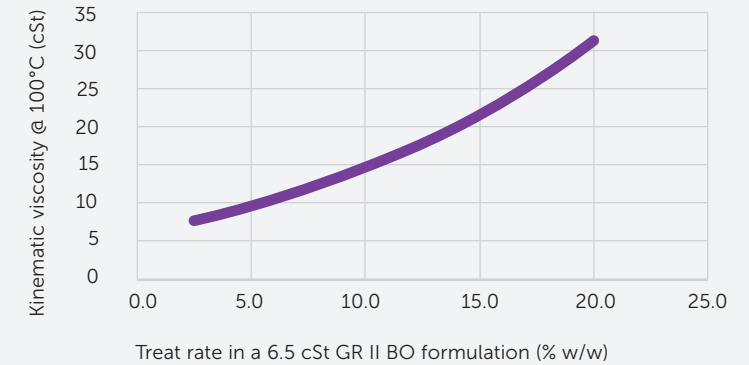
A smart balance of durability and value

Viscotech® 372L is a high-performance viscosity modifier engineered for mid- to high-tier PCMO and HDDO formulations. It provides excellent balance, durability, and viscosity control under demanding operating conditions. Its versatility also extends to grease applications, where it ensures reliable performance across a wide temperature range. Designed to combine premium performance with exceptional cost efficiency, Viscotech® 372L delivers high-quality viscosity modification without compromising value.

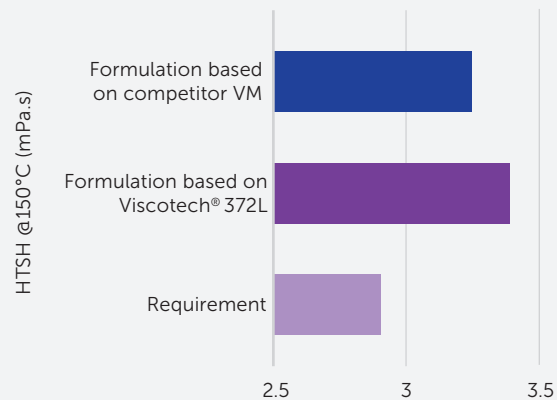
Benefits:

- Offers critical low-temperature and shear stability while maintaining cost competitiveness
- Versatile multi-application use and offers exceptional formulation flexibility
- Great compatibility with wide range of base oils

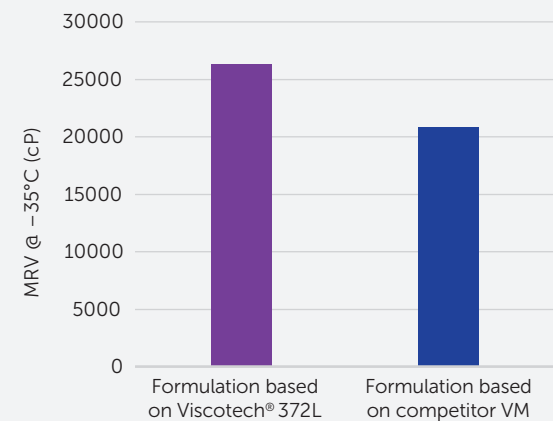
Thickening efficiency of Viscotech® 372L



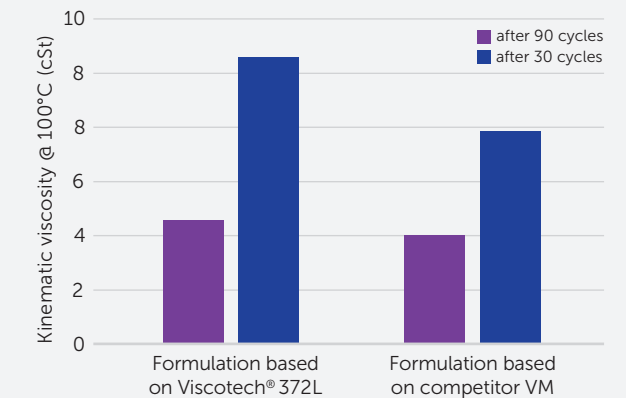
HTHS SAE 5W-40, API SN/CF



MRV SAE 5W-40, API SN/CF



Shear stability performance after 30 and 90 cycles, SAE 5W-40, 4.0–6.0 cSt, ASTM D7109



Viscotech® 533L

Multi-purpose liquid styrenic viscosity modifier

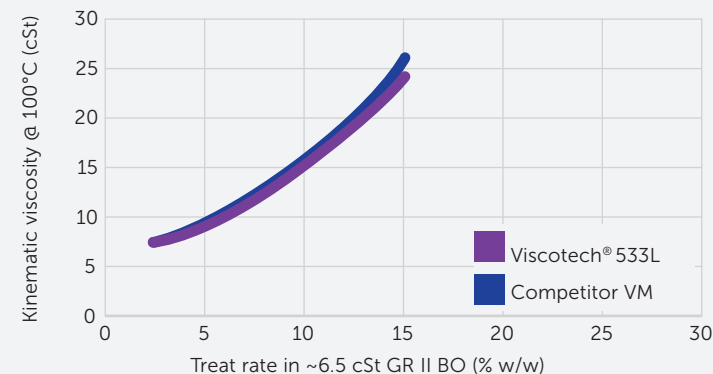
Future-oriented liquid solutions

The liquid VM possesses high shear stability (3 SSI) thanks to its special solid star-shaped styrenic polymer. Viscotech® 533L 1600 cSt dissolves well in GR II base oils. It delivers outstanding performance in multi-grade formulations and meets the exacting specifications and performance demands of today's diesel and gasoline engine oils. The star-shaped architecture enables exceptional versatility: in addition to automotive applications, it's a good alternative to PMA solutions in certain viscosity grades of hydraulic fluids.

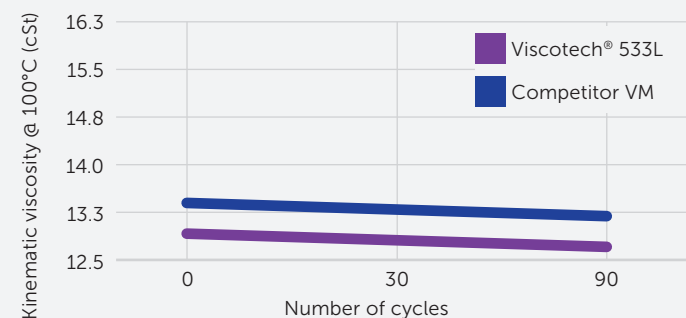
Benefits:

- Supports clean and fuel-efficient operation of diesel and gasoline engines
- Lasting excellent SSI in automotive and hydraulic systems
- Superior filterability and lower degradation for an extended service life
- Broad thermal coverage

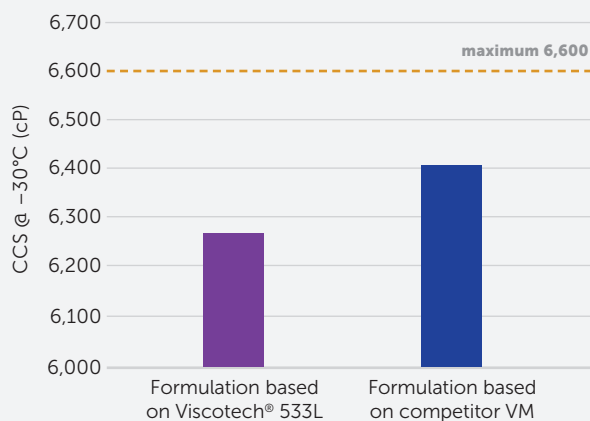
Thickening efficiency of Viscotech® 533L



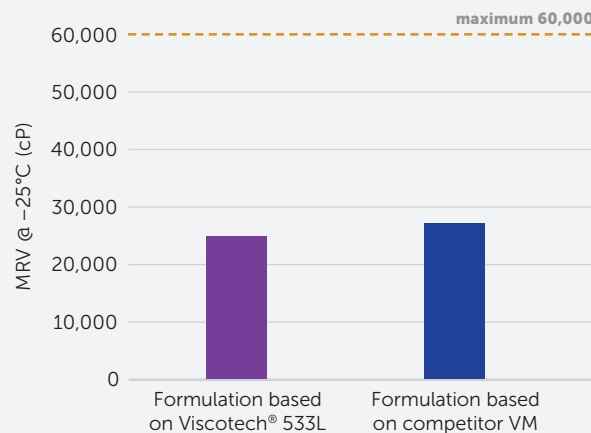
Shear stability performance after 30 and 90 cycles, SAE 5W-40, 12.5–16.3 cSt, ASTM D7109



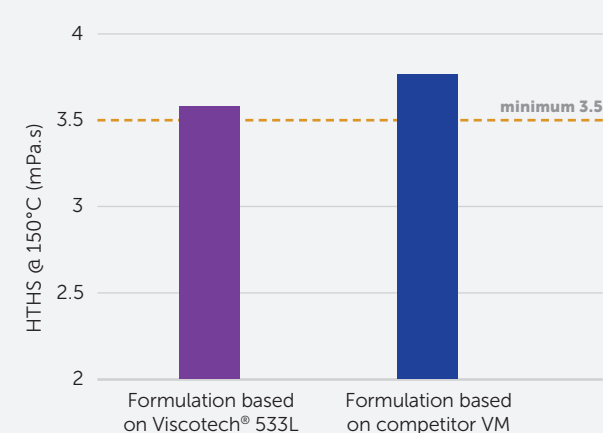
CCS SAE 5W-40



MRV SAE 5W-40



HTHS SAE 5W-40



Viscotech® 535L

Versatile liquid styrenic viscosity modifier

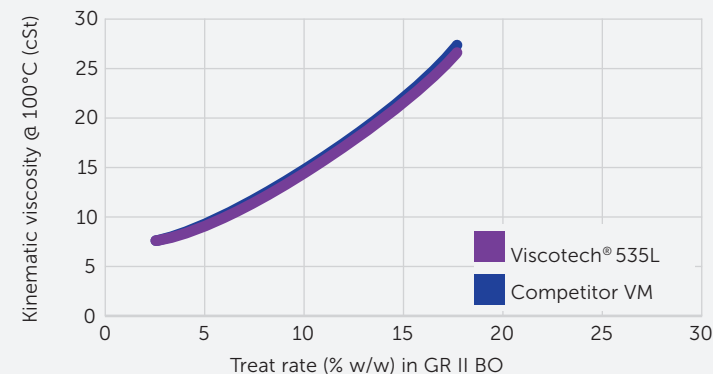
Forward-looking liquid solutions

Like Viscotech® 533L, the liquid VM possesses high shear stability (3 SSI) thanks to its special solid star-shaped styrenic polymer. Viscotech® 535L is readily soluble in GR III base oils and is also suitable for next-generation engine lubes – for example, in low-viscosity grades like 0W-XX. It offers outstanding performance in multi-grade formulations and meets the demanding specifications and performance demands of today's diesel and gasoline engine oils. The star-shaped architecture enables exceptional versatility: in addition to automotive applications, the additive is a good alternative to PMA solutions in certain viscosity grades of hydraulic fluids.

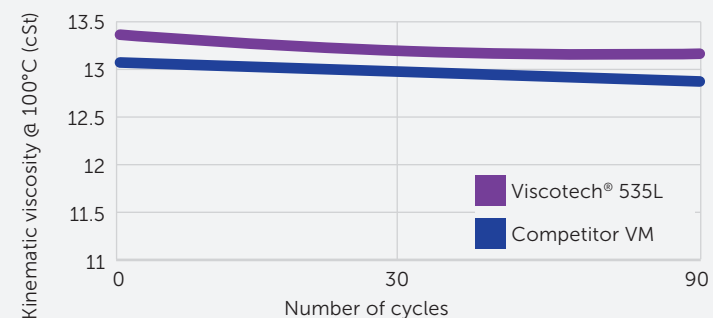
Benefits:

- Supports clean and fuel-efficient operation of diesel and gasoline engines
- Lasting excellent SSI in automotive and hydraulic systems
- Superior filterability and lower degradation for an extended service life
- Broad thermal coverage
- Meets the stringent demands of ever-lower viscosity grades – 5W-XX and even 0W-XX

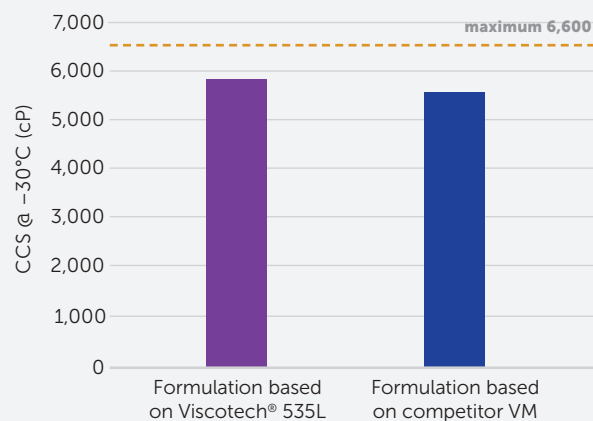
Thickening efficiency of Viscotech® 535L



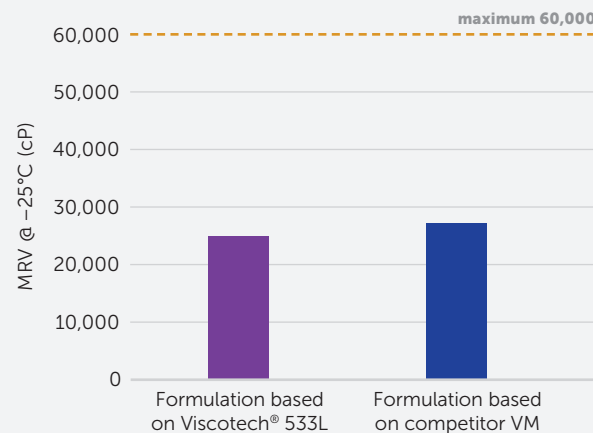
Shear stability performance after 30 and 90 cycles, SAE 5W-40, ASTM D7109



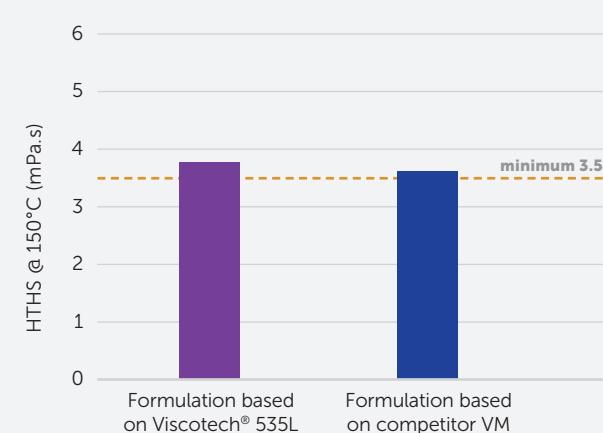
CCS SAE 5W-40



MRV SAE 5W-40



HTHS SAE 5W-40



Viscotech® 536L

Multi-functional liquid styrenic viscosity modifier

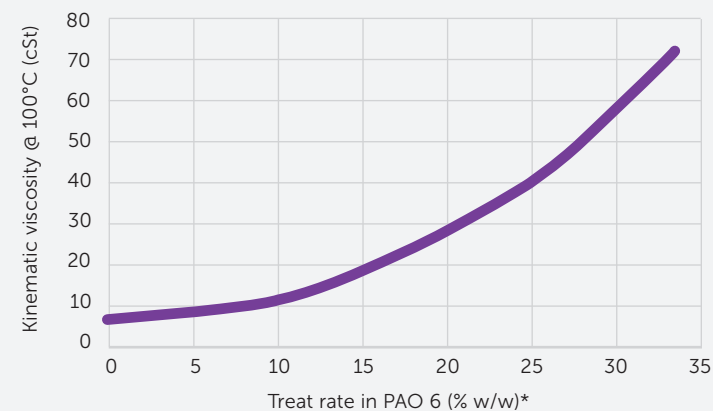
Future-proof liquid solutions

A highly shear-stable liquid styrenic viscosity modifier (3 SSI) formulated with a solid star polymer that dissolves readily into synthetic PAO 6 base oil concentrates. Its high-quality formulation imparts distinct performance benefits engineered specifically to satisfy strict requirements in modern multi-grade passenger car and heavy-duty diesel engine oils.

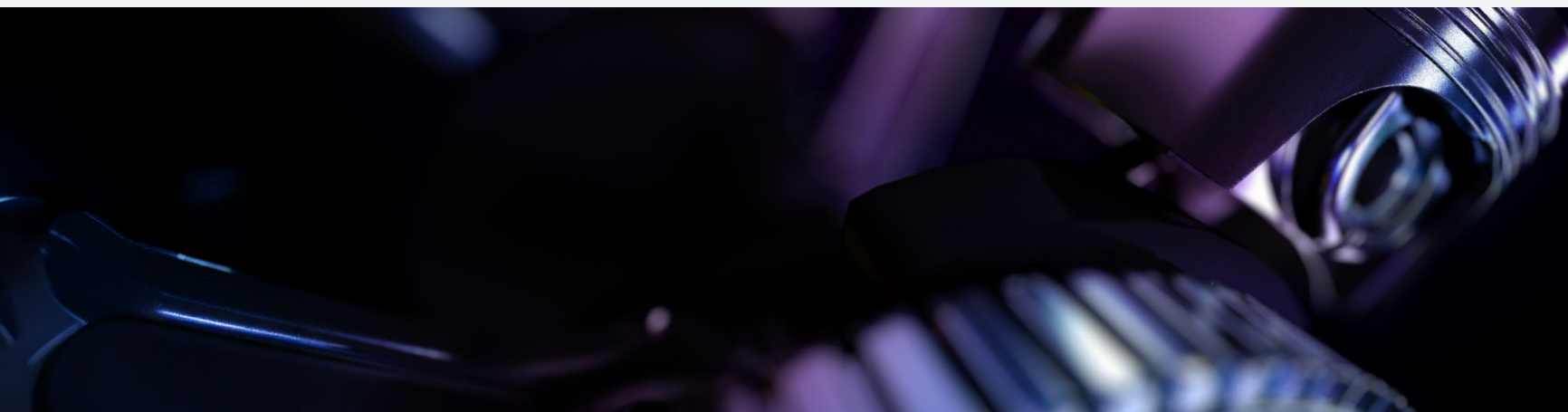
Benefits:

- Enhances oxidation stability and pour points through its PAO content,
- Delivers excellent low-temperature performance
- Provides outstanding permanent shear stability due to the structural strength
- Optimizes high-temperature viscosity

Thickening efficiency of Viscotech® 536L



* 1300 cSt Viscotech® 536L (15% w/w), dissolved in a ~6.0 cSt PAO 6 base stock



Viscotech® 431L

Liquid viscosity modifier for high-quality gear oils

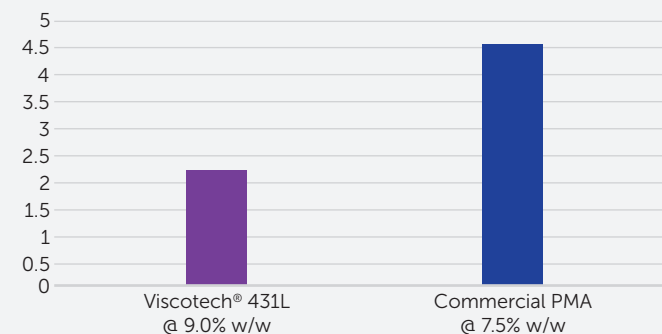
Engineered for endurance, trusted in gear oils

A liquid viscosity modifier with high shear stability, developed for high-quality gear oils. It delivers good results in (semi-)synthetic grades like SAE 75W-80, allowing versatile blenders to surpass the specific requirements of driveline applications, while future-proofing their operations.

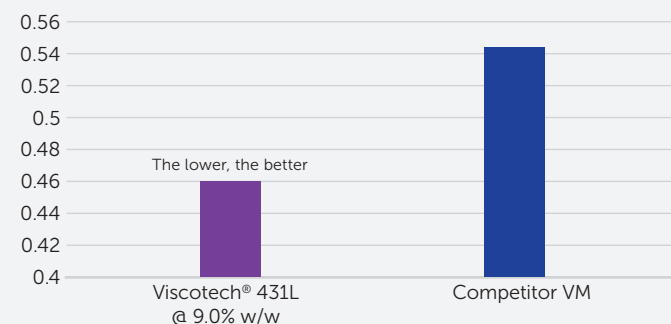
Benefits:

- Strong shear stability after 20 hrs per KRL, expressed through reduced permanent viscosity loss
- Significant low-temperature viscosity contribution to the finished lubricant
- Compatibility with Petrolad® 339 in gear oil formulations

Permanent viscosity loss (%) in API GR II/III, 75W-80 gear oil, KV @ 100°C, KRL @ 20 hrs (DIN 51350-6)



Wear scar diameter (mm) ASTM D2266 MOD



Viscotech® 451L

Dedicated liquid viscosity modifier for hydraulic oils

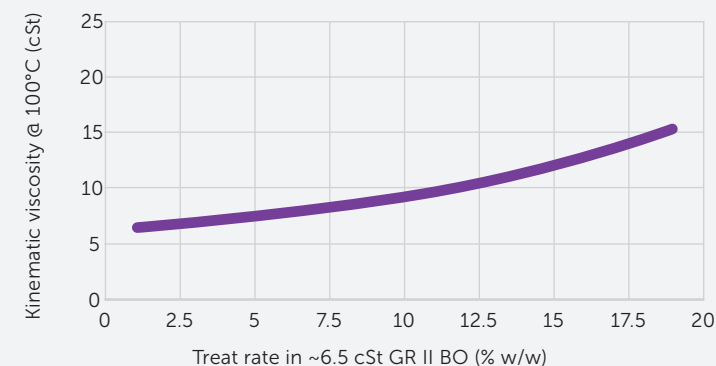
Stable under pressure, designed for hydraulic oils

A shear-stable liquid viscosity modifier, developed for creating high-quality, mainstream hydraulic oils. It exhibits particularly strong results in API GR III, ISO VG 46 blends. When mixed with suitable additives and base stocks, Viscotech® 451L helps the resulting formulation to pass the demanding KRL tapered roller bearing test, as well as to reach other targets preferred by many blenders, e.g. a higher VI.

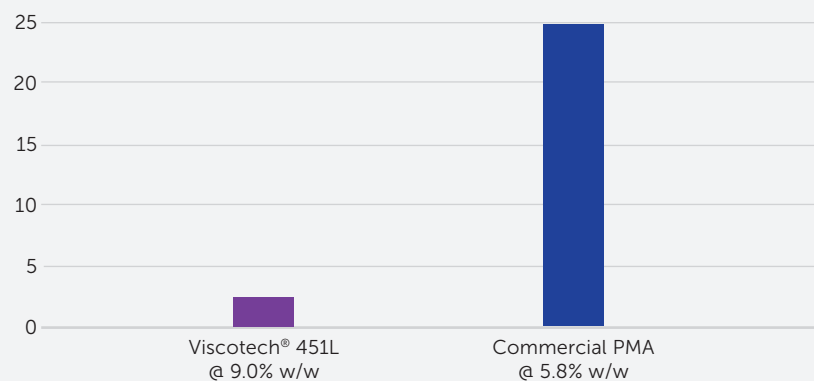
Benefits:

- Excellent shear stability after 20 hrs (per KRL) and 250 cycles (per the widespread fuel injection pump test)
- Optimum contribution to high-temperature viscosity in hydraulic oils operating under severe conditions
- Significant cost savings and efficiency gains vs PMAs in selected hydraulic oil grades

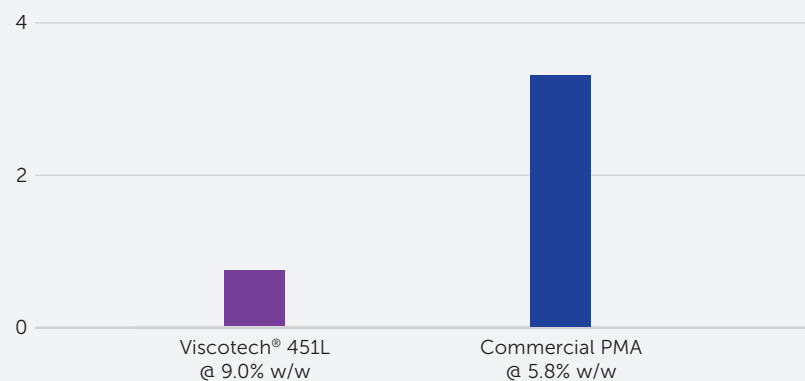
Thickening efficiency of Viscotech® 451L



Permanent viscosity loss (%) in API GR III, ISO VG 46 hydraulic oil, KV @ 100°C, KRL @ 20 hrs (DIN 51350-6)



Permanent viscosity loss (%) in API GR III, ISO VG 46 hydraulic oil, KV @ 40°C, 250 cycles (CEC L-14-A-93)



Viscotech® upcycled

The Viscotech® upcycled product line is an industry first in low-carbon viscosity modifiers. By combining high-quality, re-refined base oils with our Viscotech® viscosity modifiers, we deliver innovative formulations that meet stringent performance standards while supporting circular economy principles. They are then ready for reintroduction into the value chain – as high-value products. The result: low-carbon viscosity modifiers that deliver excellent performance. Many industries are talking about the circular economy. We're doing it.

Reduced CO₂ footprint*

~ 60 % reduction

Viscotech® with RRBO instead of VBO

CO₂ reduction (weight), final product

~ 0.2 kg CO₂ reduction per 1.0 kg

Using Viscotech® with RRBO instead of VBO in final formulation

*Note:

- The PCF values are based on production data at a specific production site. Raw materials are allocated on product level and energy on site level.
- All PCF values are based on production data from 2024 and are calculated based on GHG protocol methodology, Together for Sustainability v. 2.1 and ISCC.
- All PCF values are valid for the products in the delivered form (e.g. including water if the product is a water solution).

Product overview ¹

Viscotech®

Type		Base oil group	Product	KV100 (cSt)	SSI	Applications
Olefin copolymer (OCP) types	Solid		Viscotech® 6540	–	22	Automotive
			Viscotech® 6640	–	25	Automotive
			Viscotech® 6545	–	35	Automotive
			Viscotech® 6550	–	52	Grease
			Viscotech® 6073	–	70	Chain oils
	Liquid in virgin base oils	II	Viscotech® 6540L	1000, 1300	22	Automotive
		II	Viscotech® 6540LP	1000, 1100, 1300	22	Automotive
		II	Viscotech® 6640L	1200	25	Automotive
		II	Viscotech® 6545L	1200	25	Automotive
	Liquid in re-refined base oils	I	Viscotech® 6073LR	1200	70	Chain oils
		I	Viscotech® 6640LR	1200	25	Automotive
		I	Viscotech® 6540LR	1300	22	Automotive
		I	Viscotech® 6540LRP	1300	22	Automotive
		III	Viscotech® 535LR	1200	3	Automotive, Hydraulic
Styrenic types	Solid		Viscotech® 570	–	8	Grease, Automotive
			Viscotech® 533	–	3	Automotive, Hydraulic
			Viscotech® 483	–	10	Grease
	Liquid in virgin base oils	II	Viscotech® 483L	8.0 ²	10	Grease, Automotive
		III	Viscotech® 494L	9.0 ²	7	Automotive
		III	Viscotech® 494LD	8.5 ²	7	Automotive
		II	Viscotech® 372L	1300	15	Automotive
		II	Viscotech® 533L	1400, 1600	3	Automotive, Hydraulic
		III	Viscotech® 535L	1200	3	Automotive, Hydraulic
		III	Viscotech® 535LP	1200	3	Automotive, Hydraulic
		IV	Viscotech® 536L	1300	3	Automotive
New technology	Liquid in virgin base oils	II	Viscotech® 451L	9.0 ²	7	Hydraulic
		III	Viscotech® 431L	8.0 ²	10	Gears

¹ Please note that this is an excerpt only. To find out more, visit our website www.brb-international.com/lac

² At 10% dilution in a GR II BO





Petrolad® Lube Oil Additives

Efficiency meets endurance



Petrolad®

Driving Performance Across Every Application

Petrolad® reflects BRB's commitment to helping lubricant manufacturers meet evolving performance needs across automotive, industrial and off-road applications.

Built on decades of formulation expertise, Petrolad® offers additive packages for engine oils, gear oils, transmission fluids, hydraulic systems and agricultural equipment. The portfolio improves efficiency, equipment protection and service life while helping reduce total cost of ownership.

Its broad, flexible range supports passenger vehicles, commercial transports and industrial machinery, backed by BRB's technical expertise and application support.

As industries evolve, Petrolad® helps customers develop high-performance lubricants that deliver greater efficiency, reliability and long-term value.





Petrolad® 9632

Broad coverage up to SQ performance with single-source convenience

A premium additive package designed for light-duty engine oils seeking suitable-for-use performance without official API certification. Validated by passing essential Sequence IIIH and IX engine tests, it offers exceptional performance against piston deposits, oxidation, and wear, while ensuring broad seal compatibility.

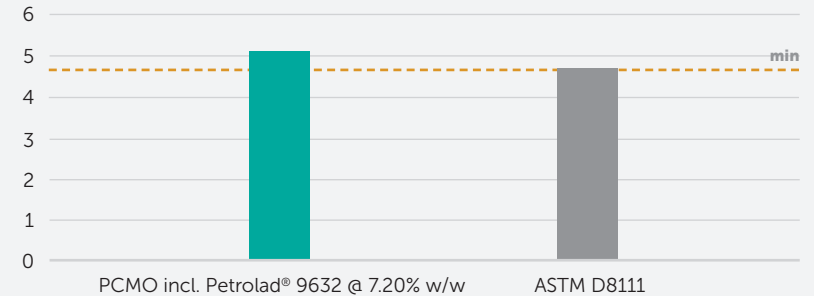
Benefits:

- Low oil filterability and reduced thermal evaporation loss
- Reduces engine wear and oxidation
- Reduces gelation and high-temperature piston deposits
- Provides broad elastomer compatibility, safeguarding seal integrity to prevent oil leaks and degradation

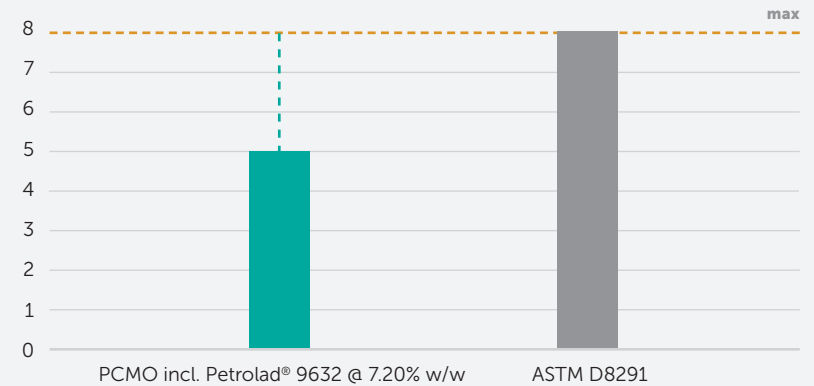


Front (left) engine pistons after running Sequence IIIH.

Seq. IIIH Avg. Weighted Piston Deposit Rating (Merits), API SQ Level, SAE 5W-30, GR III Blend



Seq. IX Events Per Iteration (#), API SQ Level, SAE 5W-30, GR III Blend



Petrolad® 9332

Engine oil additive package for diverse PCMO & MCO performance levels

Enhanced light duty engine oil additive package for diverse performance levels

An enhanced, premium additive package engineered to not only meet key API SN and ACEA C3* performance demands for gasoline engine oils, but also to deliver broader application versatility and stronger technical validation. Formulated for light-duty engine oils without the need for API and ACEA certification, Petrolad® 9332 has successfully passed critical industry engine tests, including Sequence IIH and MB M111, reinforcing its reliability under demanding operating conditions. In addition, it is developed to support motorcycle engine oils meeting JASO MA2 requirements, expanding its usability across both passenger car and motorcycle segments.

Benefits:

- Exhibits strong oxidation and wear protection
- Give exceptional fuel economy contribution
- Minimize high-temperature piston deposits
- Wide elastomer compatibility to help reduce seal degradation and oil leaks

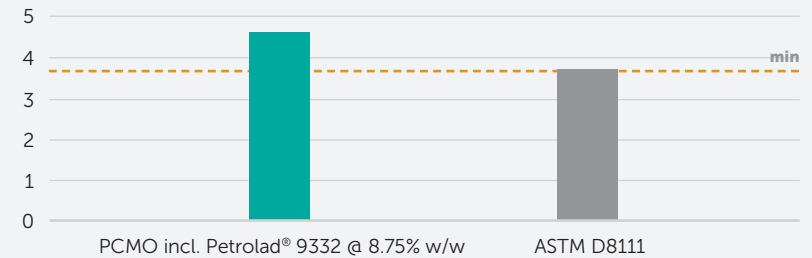


Figure 1: Front engine piston appearances after 90h of testing per Sequence IIH (ASTM D8111).

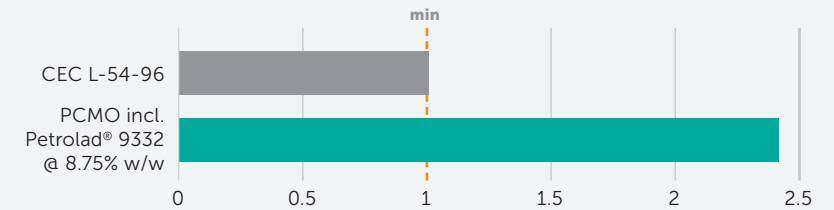


Figure 2: Rear engine piston appearances after 90h of testing per Sequence IIH (ASTM D8111).

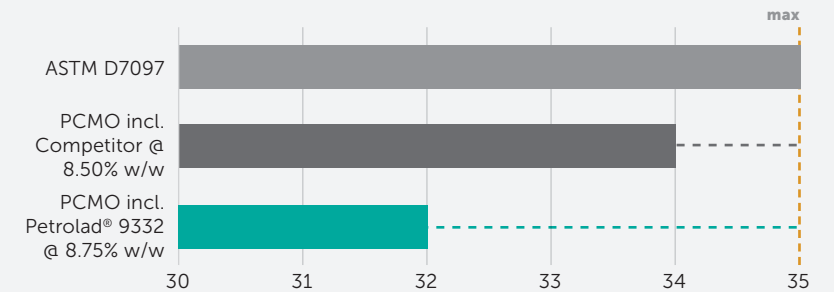
Seq. IIH Avg. Weighted Piston Deposit Rating (Merits), API SN Level, SAE 5W-30, GR III+ Blend



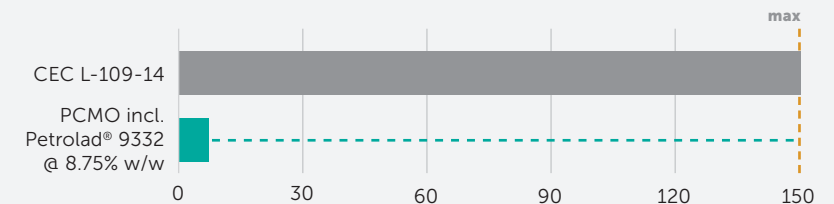
M111 Fuel Economy Improvement (%), SAE 5W-30, GR III+ Blend



TEOST MHT Deposit Mass (mg), API SN Level, SAE 5W-30, GR III+ Blends



Rel. KV100 Change After 216h (%), Oxidation In Presence Of Biodiesel, SAE 5W-30, GR III+ Blend





Petrolad® 9200

Multi-purpose engine oil additive package

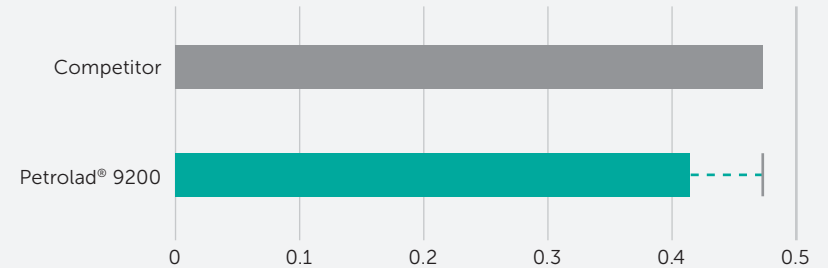
Versatility and cost-effectiveness

The multi-purpose engine oil additive package is designed for cost-effective and reliable petrol and diesel passenger-car lubricants as well as heavy-duty diesel oils using a cascade technology. Suitable for vehicles not requiring API certification. It is also suitable for motorcycle oils meeting JASO T903:2016 specifications. The solution delivers excellent wear and rust protection, deposit control and antioxidation in engines without booster packages. Thanks to optimised performance on a cascade basis and coverage of multiple key application segments for versatile lubricant manufacturers and blenders, the package offers outstanding cost-effectiveness. It also shows strong results as per various requirements of 10W-40 and 10W-30 engine oil blends.

Benefits:

- Excellent wear and rust protection, deposit control and antioxidation
- Cost savings thanks to optimised performance on a cascade basis and versatility
- Strong results regarding requirements for 10W-40 and 10W-30 engine oils

4-ball wear scar diameter (mm) in 10W-40, ASTM D4172



JASO T903:2016 specification	Test limits	10W-30 results	10W-40 results
Dynamic friction index (DFI)	1.50–2.50	1.94	1.95
Static friction index (SFI)	1.60–2.50	1.77	1.69
Stop time index (STI)	1.60–2.50	1.95	1.92

Passenger car specifications (multi-/mono-grade):

- SL/CF @ 6.00% treat rate, SJ/CF-4 @ 5.75% treat rate, SJ/CF @ 4.50% treat rate, among others (cascade basis)

Motorcycle specifications:

- JASO MA2 T903:2016

Petrolad® 9220

Cost-effective, multi-purpose engine oil additive package

Broad Capability with optimum cost

A multi-purpose engine oil additive package engineered for reliable performance across passenger cars, heavy-duty vehicles and scooters with dry clutches. Featuring API cascade technology (SL/CF to SB/CB) and JASO MB suitability, it provides a cost-effective way to target multiple regional aftermarket segments. It effectively controls deposits, evaporation, and oxidation while delivering low-friction performance.

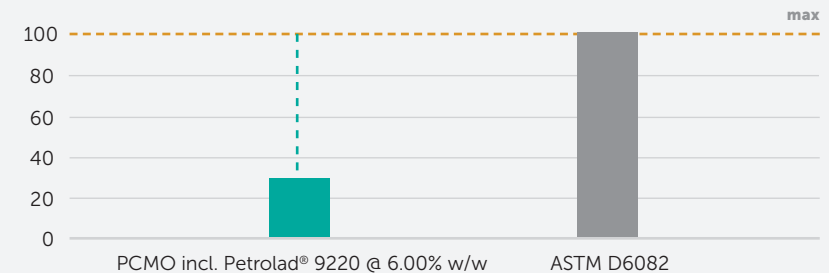
Benefits:

- Reduces evaporative loss, deposit formation, and foaming tendencies significantly
- Delivers strong oxidation resistance while minimizing friction within the finished lubricant
- Optimizes cost efficiency by leveraging a cascading formulation strategy across PCMO, HDDO, and MCO engine oil applications

JASO T903:2023 Clutch Friction Test	Test limits	MCO incl. Petrolad® 9220 @ 6.00% w/w
Mid-point dynamic friction characteristics index (DFI)	1.30-2.60	1.83 / MA
Peak-torque static friction characteristics index (SFI)	0.25-1.40	0.84 / MB
Stop-time index (STI)	1.25-2.65	1.69 / MA

Note: Per JASO T903, MB is met if at least one of the three indices (here, SFI) falls within the MB range, while the other two are within the MA ranges.

Seq. IV (150°C) Static Foam Tendency (mL), API SL/CF Level, SAE 15W-40, GR II Blend



Petrolad® 336 EP

Cost-effective, multi-purpose gear oil additive package

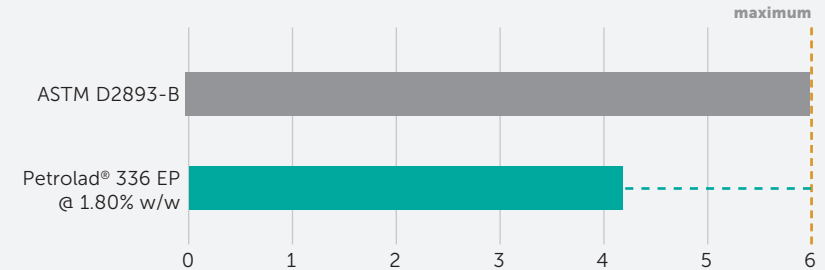
Value for money in a multi-use package

A cost-effective, low-odor additive package tailored for formulating automotive and industrial gear oils. As the extreme-pressure (EP) variant of Petrolad® 336, it is engineered for demanding off-road and high-performance applications. It offers broad solubility across mineral and select synthetic base stocks. For automotive formulations, it achieves API GL-5 performance at a maximum treat rate of 4.00% w/w, while also satisfying major industrial specifications, including ISO 12925-1 (L-CKC/CKD) and DIN 51517-3.

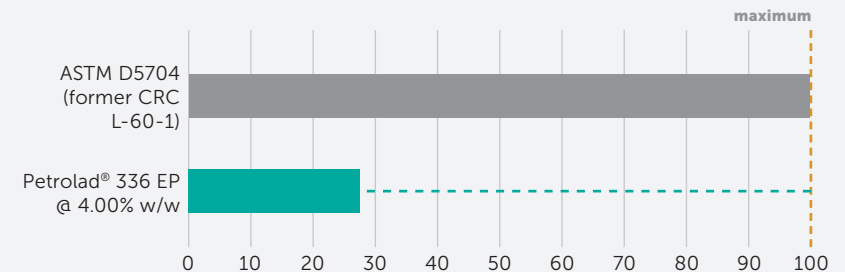
Benefits:

- Outstanding corrosion/oxidation inhibition
- Passes the Flender foaming tests in a mineral oil-based formulation
- Excellent clean gear characteristics, such as water separability and oxidation stability for prevention of costly industrial gearbox contamination
- Superior extreme pressure performance at competitive treat rates
- Flexibility and savings for producers of both automotive and industrial gear oils in different base stocks
- A low-odour solution, not classified as dangerous goods, for easier handling and storage

KV increase @ 100°C (%), oxidation stability test @ DIN 51517-3 specification, VG 220 (500 N + bright stock) oil formulation



KV increase @ 100°C (%) @ 50 h, thermal oxidation stability test @ GL-5 specification, SAE 90 (500 SN + bright stock) oil formulation



Automotive specifications:

- GL-4 @ 1.80–2.00% (w/w) treat rate
- GL-5 @ 3.80–4.00% (w/w) treat rate

Industrial specifications:

- DIN 51517-3 @ 1.80% (w/w) treat rate
- ISO 12925-1 L-CKC and L-CKD (per ISO 6743-6, for enclosed systems) @ 1.80% (w/w) treat rate



Petrolad® 339

Premium multi-purpose gear oil additive package

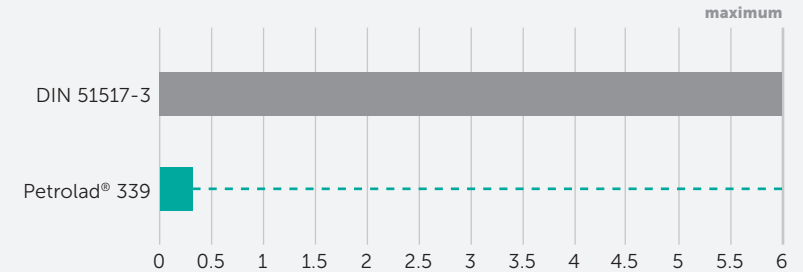
Automotive and industrial solution with an economical treat rate

The premium gear oil additive package delivers outstanding results in automotive and industrial gearboxes. Claimed at GL-5 with a 4.0% w/w dosage in mineral base oil, Petrolad® 339 simultaneously meets GL-4. The package passes the FE-8, FVA-54 and Flender foaming tests in a mineral oil-based formulation at low treat rates. It delivers excellent load-carrying capacity, with a fail load stage higher than 14 in the FZG scuffing test. It is compatible with a wide variety of base stocks and requires no dangerous goods classification. Handling and storage are easy.

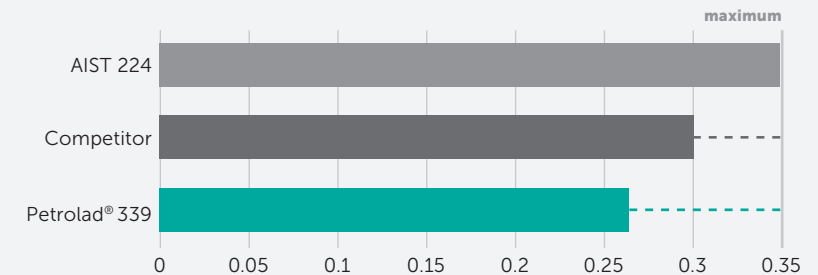
Benefits:

- Outstanding corrosion/oxidation inhibition
- Passes the Flender foaming tests in a mineral oil-based formulation
- Excellent clean gear characteristics, such as water separability and oxidation stability for prevention of costly industrial gearbox contamination
- Superior extreme pressure performance at competitive treat rates
- Flexibility and savings for producers of both automotive and industrial gear oils in different base stocks
- A low-odour solution, not classified as dangerous goods, for easier handling and storage

KV increase @ 100°C (%), D2893-A oxidation stability test



4-ball wear scar diameter (mm) mod. ASTM D2266



Automotive specifications:

- GL-4 @ 2.00% treat rate
- GL-5 @ 4.00% treat rate

Industrial specifications:*

- DIN 51517-3 @ 1.80% treat rate
- AGMA 9005-F16 (AS) @ 1.80% treat rate

*Assessed in specific tests, detailed in the product data sheet

Petrolad® 133LS

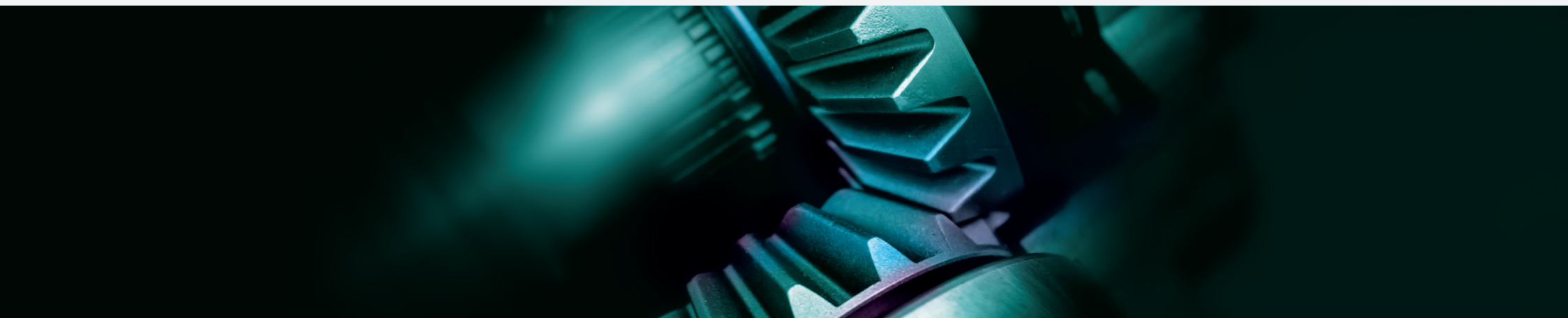
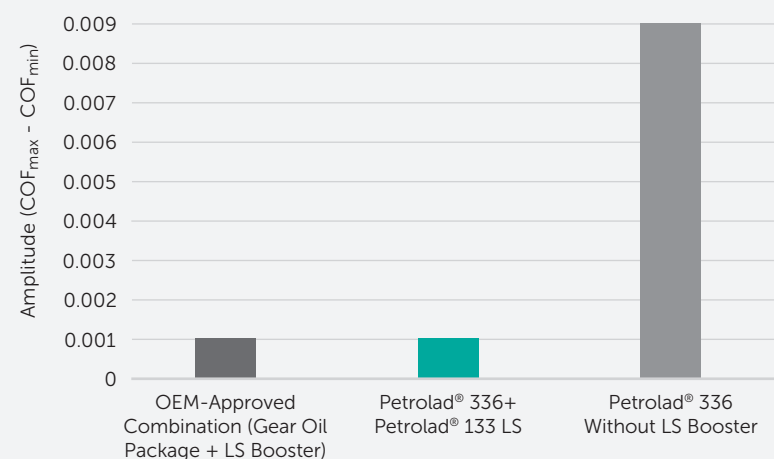
Limited slip (LS) differential axle performance booster

An additive booster intended to work together with the main package in an automotive gear oil blend to meet selected axle performance requirements of limited slip (LS) differentials, particularly friction reduction. This product is suitable for use in various mineral and (semi-)synthetic finished formulations.

Benefits:

- Excellent contribution towards friction reduction in SAE 75W-90 and 80W-90 gear oil blends
- A competitive treat rate, leading to a highly favourable net treat cost (NTC)
- No noticeable precipitation either with the individual booster or at the finished fluid level

Average amplitude of oscillations ($\text{COF}_{\text{max:stick}} - \text{COF}_{\text{min:slip}}$).
SAE 80W-90 gear oil blends' frictional performance





Petrolad® 750

ATF additive package

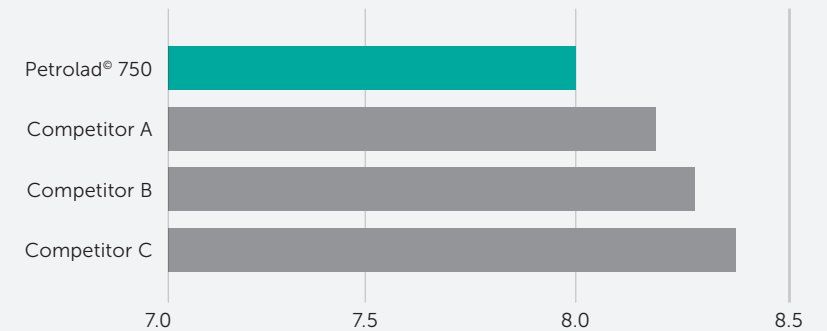
ATF additive package with an economical treat rate

The automatic transmission fluid (ATF) additive package Petrolad® 750 is the result of our decades of experience in ATF formulations. It delivers performance matching or even exceeding many known competing solutions at lower dosage. Blenders can achieve an exceptionally favourable net treat cost (NTC), while at the same time surpassing performance-level demands for Dexron IIIH (GM) and TES-389 (Allison). The package is also suitable for various other specifications and applications, including power steering fluids.

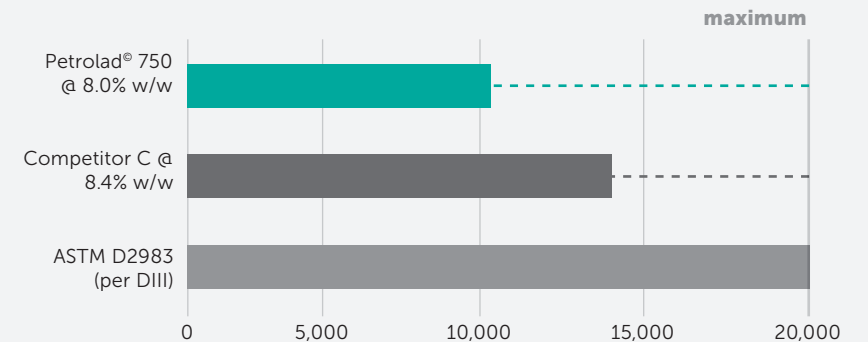
Benefits:

- Cost-effective and reliable
- Outstanding seal compatibility, e.g. with polyacrylate nitrile
- Exceptional 192-hour oxidation control and 3-hour copper results
- Excellent low-temperature properties
- Global coverage of specs and needs of leading transmission fluid types
- Suitable for GR I, II and III base oil blends

Efficiency superiority (% w/w) @ Dexron IIIH specification



Brookfield Viscosity @ -40°C; GR II ATF blend results (cP)



Petrolad® 1846

Multi-purpose, ashless hydraulic oil additive package

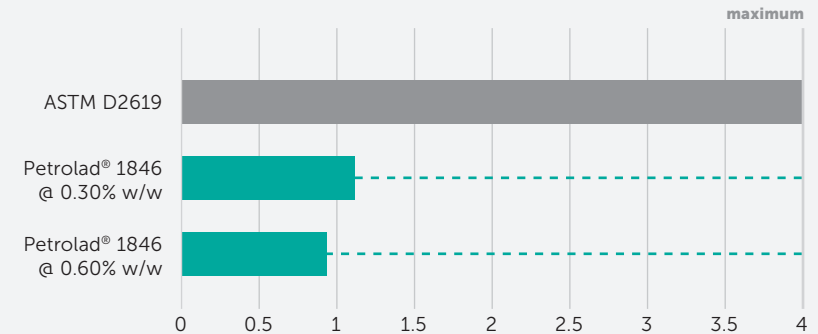
For synthetic and mineral-based hydraulic fluids

The additive is specially designed for ashless hydraulic fluids, compressor fluids and other industrial oils. A single-source, highly versatile package that offers significant cost savings. Thanks to outstanding corrosion protection, good filterability, demulsification and excellent anti-wear properties, it helps extend fluid and equipment service life. It features low treat rates and offers exceptionally high oxidation stability. With appropriate base oil types and quantities, Petrolad® 1846 enables biodegradable hydraulic oil formulations (see product data sheet).

Benefits:

- Outstanding anti-wear (AW) results
- Minimised hydraulic system contamination
- Cost savings and reduced environmental impact thanks to low treat rate
- Good steel and copper protection
- Excellent filterability
- Extended fluid and equipment life

Hydrolytic stability: acidity of water layer (mg KOH/25g), GR III BO, ISO VG 32



Specifications:

- Hydraulic: DIN 51524 Part 1 (R&O) @ 0.30% treat rate
- Turbine: AIST 120 @ 0.30% treat rate
- Compressor: DP 6521 @ 0.30% treat rate
- Gear: DIN 51517 Part 2 @ 0.30% treat rate



Petrolad® 5101

Universal tractor transmission oil additive package

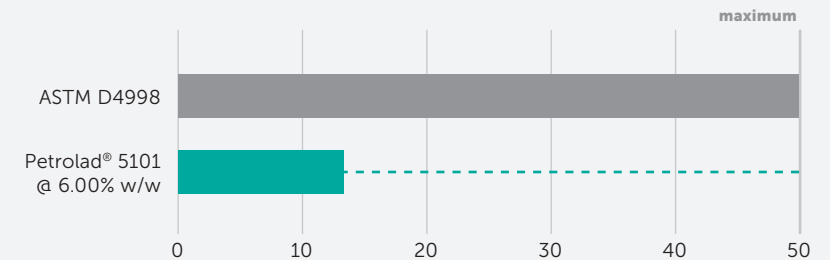
Universal off-road performance

The off-road additive package, designed for universal tractor transmission oil (UTTO) fluids, is suitable for transmissions, power steering and hydraulic systems. It meets the needs of traditional vehicles in the largest tractor markets worldwide and is also used in non-agricultural applications with wet brakes, powershift transmissions and hydraulics. The package is proven to work in various base oil formulations with especially favourable qualities in GR II blends, providing economical treat rates. Its outstanding features include superior friction control and minimal foaming, excellent anti-wear properties and protection of drive gears without damage to soft yellow metals in hydraulic pumps. It also provides antioxidation and copper corrosion prevention in axial piston hydraulic pumps. Additionally, it eliminates chatter in wet brakes and reduces operator fatigue.

Benefits:

- Superior friction control and minimal foaming
- Outstanding (low-speed) anti-wear qualities to protect the final drive gears, without damaging the soft yellow metals in many hydraulic pumps
- Oxidation and copper corrosion prevention in axial piston hydraulic pumps
- Eliminated chatter in wet brakes and reduced operator fatigue
- Economical treat rate, especially with the wide spec coverage, making it a desirable offering for cost-conscious customers

FZG low-speed tractor gear wear: mass loss (mg) GR II BO formulation



Specifications:

- John Deere J20C/J20D @ 6.00% treat rate
- Case New Holland MAT 3505, 3525/3526 @ 6.00% treat rate
- Massey Ferguson CMS M1135/41/43/45 @ 6.00% treat rate



Petrolad® 5201

Super tractor oil universal additive package

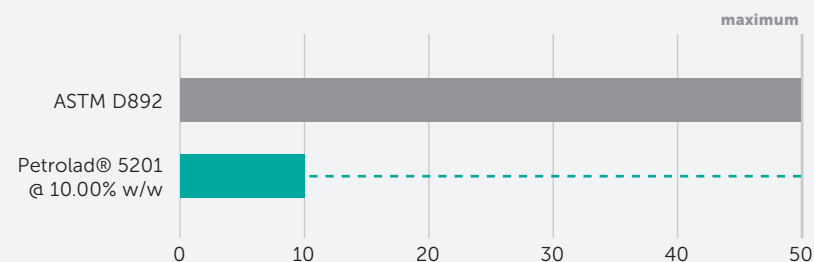
Designed for the global tractor market

The universal off-road additive package is designed specifically for super tractor oil universal (STOU) applications for traditional tractor equipment common in global markets. It is suitable for crankcases, transmissions, power steering and hydraulic systems. The solution also covers several universal tractor transmission oil (UTTO) specifications, making it a flexible package ideal for blenders seeking cost-effective solutions. Its outstanding features include boosted soot control for reduced viscosity increase, superior anti-wear results for limited pitting and scoring in final drives and excellent friction performance in transmission clutches. It offers favourable 10W-30 and 15W-40 outcomes in GR I STOU formulations.

Benefits:

- Boosted soot control for a reduced viscosity increase
- Superior anti-wear results, leading to limited pitting and scoring in final drives
- Excellent friction performance in transmission clutches
- Desirable 10W-30 and 15W-40 results in GR I STOU formulations

Foaming volume (ml) @ end of 5-minute blowing period,
ASTM D892 foaming tendency sequence II @ 93°C,
10W-30 and 15W-40 GR I formulations



Specifications:

- ZF TE ML 06/A/B/C/D, 07B (STOU) @ 10.00% w/w treat rate
- John Deere J27 (STOU) @ 10.00% w/w treat rate
- Caterpillar TO-2, MIL-L-2104D (UTTO) @ 10.00% w/w treat rate



Petrolad® 484BD

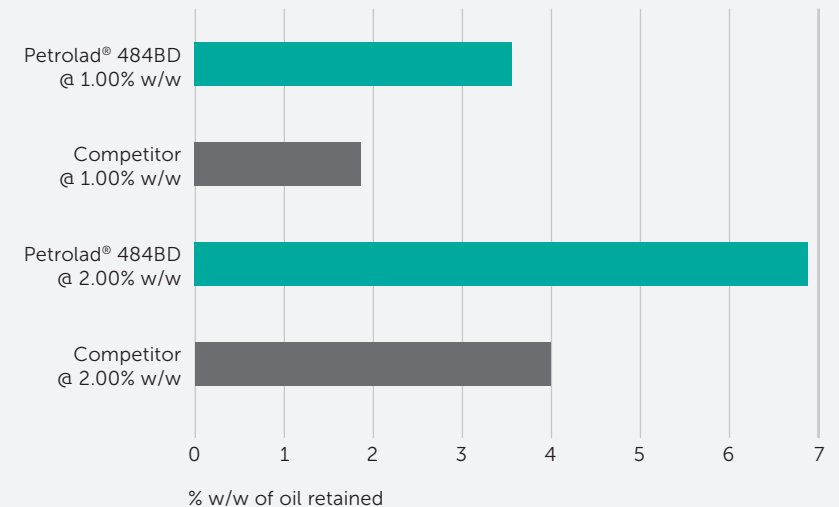
Biodegradable tackifier additive

The efficient, biodegradable tackifier additive is specifically formulated to dissolve easily in natural vegetable oils. It can be used for various applications, including steel cable and chain lubricants, rust protection, chainsaw and slideway lubricants, rock-drilling oils, rail curve and other greases, sealants and anti-misting agents for neat metalworking fluids.

Benefits:

- Quickly and easily dissolves in natural vegetable oils, including rapeseed oil and synthetic esters
- All components are biodegradable (90% by OECD 301B)
- Petrolad® 484BD is FDA-approved
- Equips biodegradable vegetable oils with superior tackifying properties
- Typically used at a treat rate of 1.00–3.00% w/w

Cling test results for biodegradable tackifier additive based on rapeseed oil in Brookfield viscometer no. 1 set-up





Petrolad® 484FT and 485FT

Tackifier additives

Efficiency and easy handling

Two extremely efficient, easy-to-handle tackifier additives specifically formulated for mineral oil-based lubricants for various applications like chain lubricants, rust protection, chainsaw and slideway lubricants, rock-drilling oils, rail curve greases, sealants and anti-misting agents for neat metalworking fluids. Petrolad® 484FT is characterised by low viscosity for easy handling, while Petrolad® 485FT is a concentrated tacky resin solution. It is a clear liquid even at low temperatures (>5°C) and can be easily dissolved in a large range of base oils.

Benefits:

- Significantly more efficient than known competitor products, enabling equivalent tackiness at lower treat rates
- Low viscosity for easy handling (484FT)
- Quickly and easily dissolves in mineral oil lubricant formulations. It is soluble in paraffinic and naphthenic oils, PAOs, polyisobutylenes and some esters, e.g. trimellitates, and ditiidecyl adipate (DTDA)
- Excellent properties relating to clingability and stringiness
- Can typically be used at a treat rate of 0.25–1.00% w/w (Petrolad® 484FT) and 0.15–1.00% w/w (Petrolad® 485FT)



Product overview ¹

Petrolad®

Engine oil additives

Heavy-duty diesel oils (HDDO)	Petrolad® 8770
	Petrolad® 8771SC
Passenger car motor oils (PCMO)	Petrolad® 9200
	Petrolad® 9220
	Petrolad® 9332
	Petrolad® 9632

Driveline additives

Gear oil	Petrolad® 336
	Petrolad® 336EP
	Petrolad® 339
	Petrolad® 133LS
Automatic transmission fluids (ATF)	Petrolad® 750
	Petrolad® 751

Off-road

Universal tractor transmission oil (UTTO)	Petrolad® 5101
Super tractor universal (STOU)	Petrolad® 5201

Hydraulic additives

Ashless	Petrolad® 1846
Zinc-containing	Petrolad® 9530
	Petrolad® 9533

Sulphonates

Overbased calcium sulphonate detergent	Petrolad® 6779 (A)
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Coolants

	Petrolad® 3550
	BRB Long-life coolant

Tackifier additives

	Petrolad® 484FT
	Petrolad® 485FT

Non-EU Reach product list

1. Petrolad® 9220
2. Petrolad® 9330
3. Petrolad® 8830

¹ Please note that this is an excerpt only. To find out more, visit our website www.brb-international.com/lac



Abbreviations

BO	base oil
CCS	cold-cranking simulator
EP	extreme pressure
FM	friction modifier
HTHS	high-temperature, high-shear
KV	kinematic viscosity
MRV	mini-rotary viscometer
PPD	pour point depressant
RR	re-refined
SSI	shear stability index
TE	thickening efficiency
TR	treat rate (referring to additive dosages)
VG	viscosity grade
VI	viscosity index
VIRG	virgin





A Subsidiary of PETRONAS Chemicals Group

**BRB Lube Oil Additives &
Chemicals B.V.**

Voltaweg 26
6101 XK Echt
Postbus/PO Box 3552
6017 ZH Thorn
The Netherlands

Phone: +31 475 560 300
Email: info@brbbv.com
www.brb-international.com/lac

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