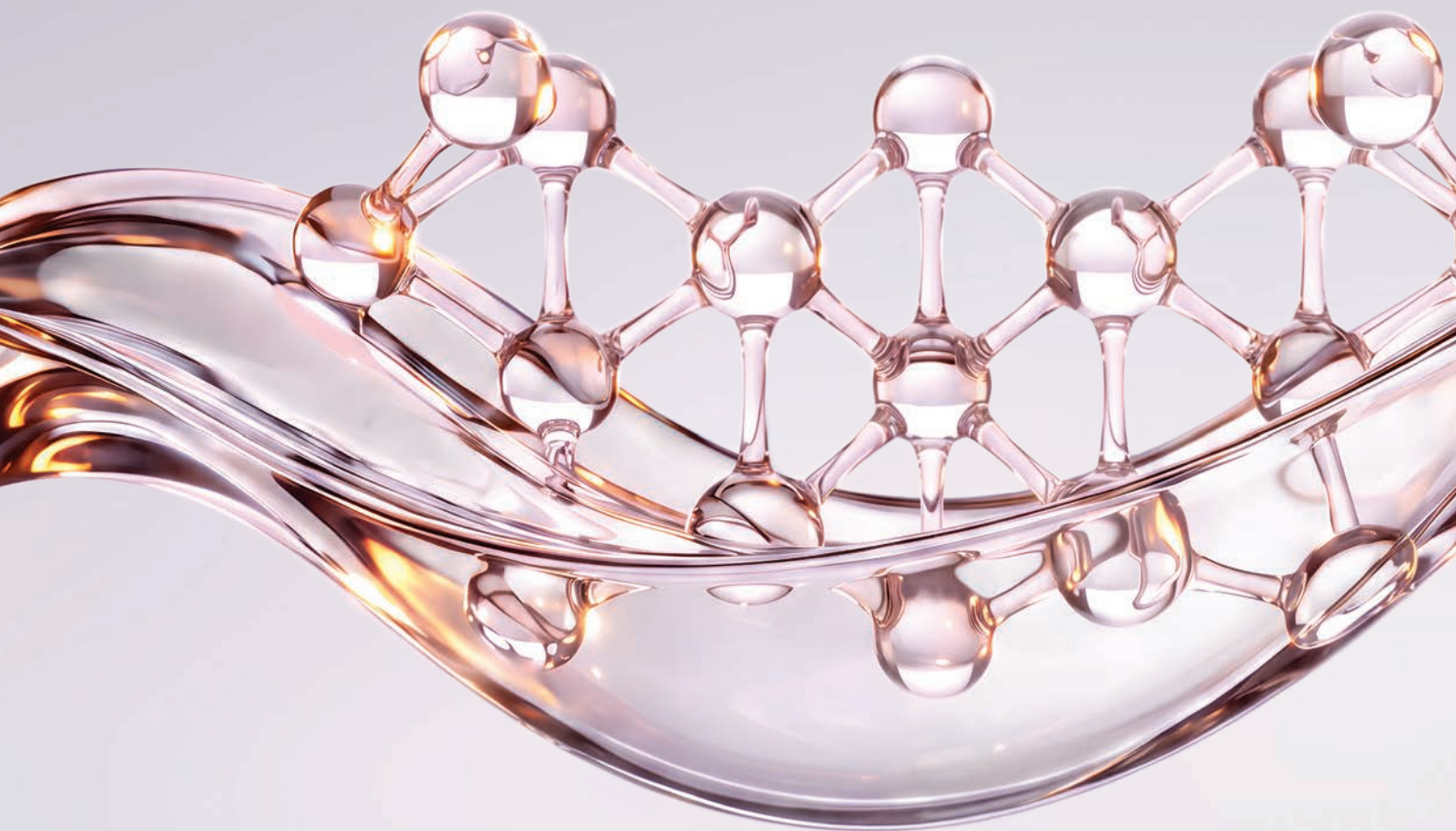




ORLEN
OIL

BUILT ON CONFIDENCE.

A stronger base
for what's next.



amber
BASE
GROUP II

BASE OILS PRODUCTION AND DISTRIBUTION



Flexibags



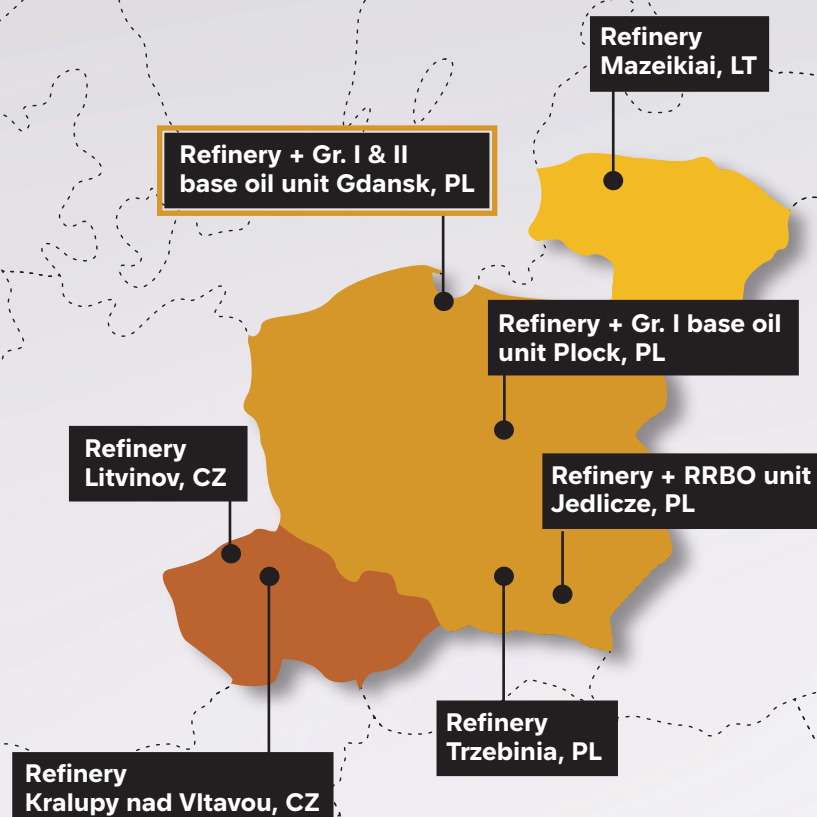
Bulk



Rail Tankers



Road Tankers



AMBER BASE GROUP II

amber
BASE
GROUP II

A stronger base for what's next.

Powered by 50 years of experience, the base stocks produced by ORLEN Group ensure stable, high-performance lubricant production. Access to innovative technologies and top experts allows us to conduct base stock investments (Group II), meeting growing market demand for advanced products. Thanks to this, ORLEN OIL can offer packages of both types of base stocks – Group I and Group II.

Our Group I Base Stocks and Amber Base Group II (with unit start-up scheduled by the end of 2026) cover a wide range of products in terms of physical properties. ORLEN OIL base stocks offer top-tier quality along with cost optimisation by effective applications in finished lubricants. ORLEN OIL is the best partner for companies seeking stability in supply, quality and the use of a wide range of distribution channels. We offer comprehensive solutions to anyone seeking secure supplies of pure high-performance base stocks.

Comprehensive Solutions

Pioneering product like 1500 BS are our response to meet evolving market expectations. Due to its physical properties, it might revolutionise the market, outlining potential opportunities in finished product applications.

Reliable Supply

Due to its location and production capacity, ORLEN OIL is transitioning from a regional to a global supplier of base stocks. We cover a wide range of logistics capabilities (land and maritime). To expand our abilities to reach end customers, it is planned to distribute base stocks from the ARA region using various means of transportation.

At ORLEN Group, we ensure a stable and secure supply.

Built on Consistent Quality

At ORLEN OIL, we realise that stable and predictable base stock quality is crucial for our customers. As such, we support our customers in maintaining a competitive edge with highly advanced and high-performance technology that ensures excellent purity.



GROUP I BASE STOCKS

ORLEN OIL Group I Base Stocks cover a wide range of viscosity grades that empower customers to blend high-performance mineral lubricants. To meet customer needs, our Group I Base Stocks are certified for use in engine and industrial oils, achieving desired performance. At ORLEN OIL, we provide stable supply chains and uniform product quality as we are aware of how important it is to lubricant blenders. Our manufacturing processes are carried out at 2 locations in Europe.

Gr. I Base Stocks meet API/ATIEL guidelines for the formulation and qualification of automotive and industrial lubricants.



Group I Benefits for Our Customers



With Group I Base Stocks, we cover a wide range of automotive and industrial applications for mine-ral lubricants, providing our customers with high-performance technologies.



We cover a wide range of logistics capabilities – land (rail, road, flexibags) and maritime.

Specifications Group I Base Stocks (Płock Site)

Property	Standard method	SN-100	SN-150	SN-500	SN-650
Appearance	Visual	Clear and Bright	Clear and Bright	Clear and Bright	Clear and Bright
ASTM Color, max.	ASTM D 1500	0.5	1	2.5	3.5
CCS Viscosity -15°C mPa*s, max.	PNC04150	-	1400	-	-
Flash Point, min.	PN-EN ISO 2592	190	210	220	240
Kinematic Viscosity @ 40°C	PN-EN ISO 3104	20.5–22.4	28.8–33.5	min. 95	min.135
Kinematic Viscosity @ 100°C	PN-EN ISO 3104	3.8-4.3	5.0-5.5	10.5-12	13.0-16.2
Pour Point, max.	PN-ISO 3016	-15	-12	-9	-9
Viscosity Index	-	>95	>95	>90	>87
NOACK wt%, max.	PN-C-04124	29	18.5	-	-

Specifications Group I Base Stocks (Gdańsk Site)

Property	Standard method	SN-150 (SAE 10/95)	SN-500 (SAE 30/95)	BS (Bright stock 30/90)
Appearance	Visual	Clear and Bright	Clear and Bright	Clear and Bright
ASTM Color, max.	ASTM D 1500	1	1.5	5
CCS Viscosity -15°C mPa*s, max.	PN-C-04150	1,400	-	-
Flash Point, min.	PN-EN ISO 2592	210	240	300
Kinematic Viscosity @ 40°C	PN -EN ISO 3104	28.8-33.5	-	about 580
Kinematic Viscosity @ 100°C	PN-EN ISO 3104	5.2-5.9	9.6-12.9	min. 30
Pour Point, max.	PN-ISO 3016	-15	-9	-6
Viscosity Index	-	>95	>95	>90
NOACK wt%, max.	PN-C-04124	15	15	-

AMBER BASE— GROUP II BASE STOCKS

(start-up scheduled by the end of 2026)

Amber Base – Group II Base Stocks produced by ORLEN Group are designed to secure market requirements for advanced high-performance lubricant technologies. Amber Base slate is being manufactured at the Gdańsk Site, based on CLG technology, meeting API/ATIEL guidelines for the formulation and qualification of automotive and industrial lubricants. The site's location in the Central & Eastern Europe region, with direct access to the Baltic Sea, guarantees supply chain resilience (overland and maritime supplies).

Planned unit start-up by the end of 2026.



Specifications Amber Base – Group II (Gdańsk Site)

Property	Standard method	Amber Base 100N	Amber Base 220N	Amber Base 600N	Amber Base 1500 BS
Appearance	Visual	Clear and Bright	Clear and Bright	Clear and Bright	Clear and Bright
ASTM Color, max.	ASTM D 1500	1	1.5	1.5	1.5
CCS Viscosity -25°C mPa*s, max.	PN-C-04150	1,650	5,400	25,400	-
CCS Viscosity -20°C mPa*s, max.	PN-C-04150	-	3,600	-	-
Flash Point, min.	ASTM D92	192	212	246	290
Kinematic Viscosity @ 40°C	PN-EN ISO 3104	18.7-20.8	40-46.0	min. 100	min. 320
Kinematic Viscosity @ 100°C	PN-EN ISO 3104	4.0-4.3	6.4-6.7	11.5-12.9	min.26
Viscosity Index	-	>95	>95	>95	>95
Pour Point, max	PN-ISO 3016	-12	-12	-12	-30
NOACK wt%, max	PN-C-04124	25	12	-	-
Saturates, wt%	ASTM D7419	>98	>98	>97	>96

Amber Base – Group II Benefits for Our Customers



Compatibility

Amber base technology is created to achieve a broad compatibility for lubricant applications. A wide range of viscosities offers extensive technical opportunities, from using those base stocks in light auto-motive engine oils to applying them in heavy industrial product formulations.



Supply Chain

We cover a wide range of logistics capabilities (land and maritime). To improve the ability to reach final customers, we plan to distribute base stocks from the ARA region using various means of transportation. At ORLEN OIL, we ensure a stable and secure supply.



Efficiency

The exceptional physical parameters of our Group II base stocks allow our customers to maximise their efficiency by cost-optimising formulations for finished lubricants. Delivering high and consistent quality alongside cost optimisation is part of our DNA.





AMBER BASE 100N | 220N

Application and Benefits
of Amber Base 100N | 220N



Amber Base 100N, used together with 220N, is dedicated to advanced formulations in automotive (PCMO, HDDO), driveline and industrial segments, while limiting the usage of Group III and delivering cost optimisation to lubricant producers.



Compliance of finished product formulations with most of the ACEA and API requirements.



Due to its physical properties like low-temperature performance, low volatility and high saturates, it enables our customers to develop solutions that address market needs for technically advanced products, ensuring cost competitiveness.



Property	Standard method	Amber Base 100N	Amber Base 220N
Appearance	Visual	Clear and Bright	Clear and Bright
ASTM Color, max.	ASTM D 1500	1	1.5
CCS Viscosity -25°C mPa*s, max.	PNC04150	1,650	5,400
CCS Viscosity -20°C mPa*s, max.	PNC04150	-	3,600
Flash Point, min.	ASTM D92	192	212
Kinematic Viscosity @ 40°C	PN-EN ISO 3104	18.7-20.8	40-46.0
Kinematic Viscosity @ 100°C	PN-EN ISO 3104	4.0-4.3	6.4-6.7
Viscosity Index	-	>95	>95
Pour Point, max.	PNISO 3016	-12	-12
NOACK wt%, max	PNC04124	25	12
Saturates, wt%	ASTM D7419	>98	>98

AMBER BASE 600N

Application and Benefits
of Amber Base 600N



Amber Base 600N – a base stock dedicated to advanced formulations in automotive engine oils (XW-40 & XW-50 grades), driveline (80W, 90, 80W-90 and 85W-140 grades) and such applications as industrial gears, hydraulics, turbines and many others.



Designed to meet the latest API and numerous ACEA and industrial OEM requirements for finished product formulations.



Due to its physical properties like low-temperature performance, low volatility, low sulphur content and high saturates, it enables our customers to develop solutions that address market needs for technically advanced products, ensuring cost competitiveness.



Property	Standard method	Amber Base 600N
Appearance	Visual	Clear and Bright
ASTM Color, max.	ASTM D 1500	1.5
CCS Viscosity -25°C mPa*s, max.	PN-C-04150	25,400
CCS Viscosity -20°C mPa*s, max.	PN-C-04150	-
Flash Point, min.	ASTM D92	246
Kinematic Viscosity @ 40°C	PN-EN ISO 3104	min. 100
Kinematic Viscosity @ 100°C	PN-EN ISO 3104	11.5-12.9
Viscosity Index	-	>95
Pour Point, max.	PN-ISO 3016	-12
NOACK wt%, max.	PN-C-04124	-
Saturates, wt%	ASTM D7419	>97



AMBER BASE 1500 BS

Application and Benefits of Amber Base 1500 BS



Amber Base 1500 BS – a base stock dedicated to newly designed formulations for engine oils, especially marine and gear oils, as well as automotive and industrial and greases, delivering highly advantageous performance.



Due to its physical properties like low-temperature performance (pour point max. -30°C) and a high viscosity index, it enables our customers to develop solutions that address market needs for technically advanced products, ensuring cost competitiveness by replacing alternative high viscosity grades. The visibly light colour of Amber Base 1500 BS supports a diverse range of applications.

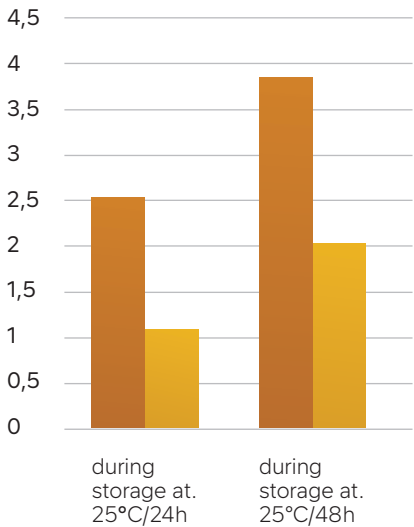


Specifications Amber Base 1500 BS – Group II (Gdańsk Site)

Property	Standard method	Amber Base 1500 BS
Appearance	Visual	Clear and Bright
ASTM Color, max.	ASTM D 1500	1,5
CCS Viscosity -25°C mPa*s, max.	P-N--C-04150	-
CCS Viscosity -20°C mPa*s, max.	P-N--C-04150	-
Flash Point, min.	ASTM D92	290
Kinematic Viscosity @ 40°C	PN--EN ISO 3104	min. 320
Kinematic Viscosity @ 100°C	PN--EN ISO 3104	min. 26
Viscosity Index	-	>95
Pour Point, max.	PN--ISO 3016	-30
NOACK wt%, max.	PN--C--04124	-
Saturates, wt%	ASTM D7419	>96

New Possibilities begin with AMBER Base 1500 BS

Oil separation from grease % (m/m)

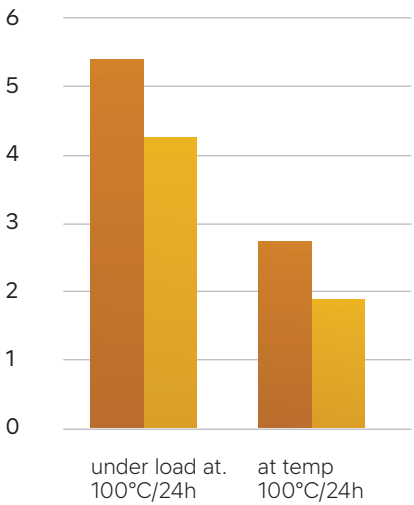


Reference Grease
Lithium NLGI-2 class with Gp I base oil

Tested Grease
Lithium NLGI-2 class with AMBER Base 1500 BS

Increase in structural stability of grease - increase in the degree of oil binding in the grease as a function of time by 56% and 47%, respectively

Oil separation from grease % (m/m)

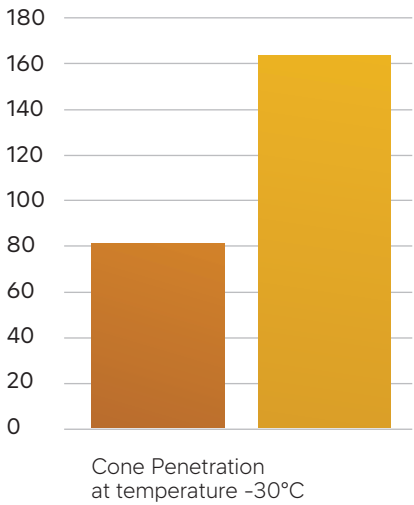


Reference Grease
Lithium NLGI-2 class with Gp I base oil

Tested Grease
Lithium NLGI-2 class with AMBER Base 1500 BS

Increase in structural stability of grease - Modeling of structural durability during operation.-increase as a function of load by 20% and 30%, respectively

Cone Penetration at temperature -30°C (mm/10)

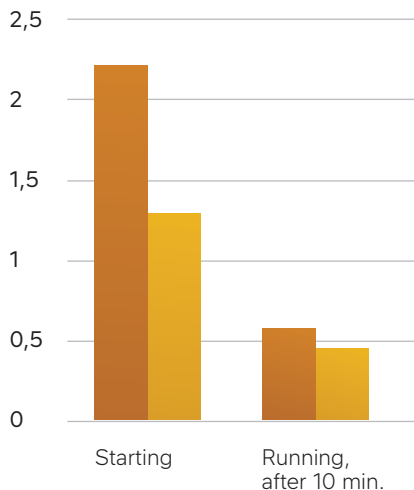


Reference Grease
Lithium NLGI-2 class with Gp I base oil

Tested Grease
Lithium NLGI-2 class with AMBER Base 1500 BS

Operation at low temperature - two-fold increase in cone penetration

Low Temperature Torque - 40°C (Nm)

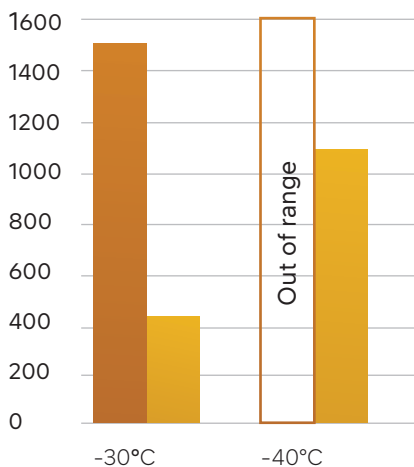


Reference Grease
Lithium NLGI-2 class with Gp I base oil

Tested Grease
Lithium NLGI-2 class with AMBER Base 1500 BS

Operation from low temperature - Reduction of resistance to movement at low temperatures by 44% during start-up and by 29% during operation

Flow pressure at temperature (hPa)

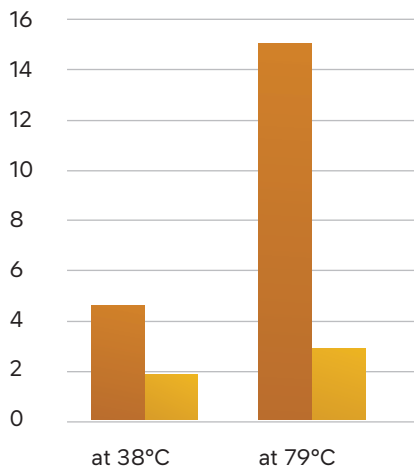


Reference Grease
Lithium NLGI-2 class with Gp I base oil

Tested Grease
Lithium NLGI-2 class with AMBER Base 1500 BS

Improved low temperature performance - three times greater mobility of the grease

Determining the Water Washout characteristic of grease (% (m/m))

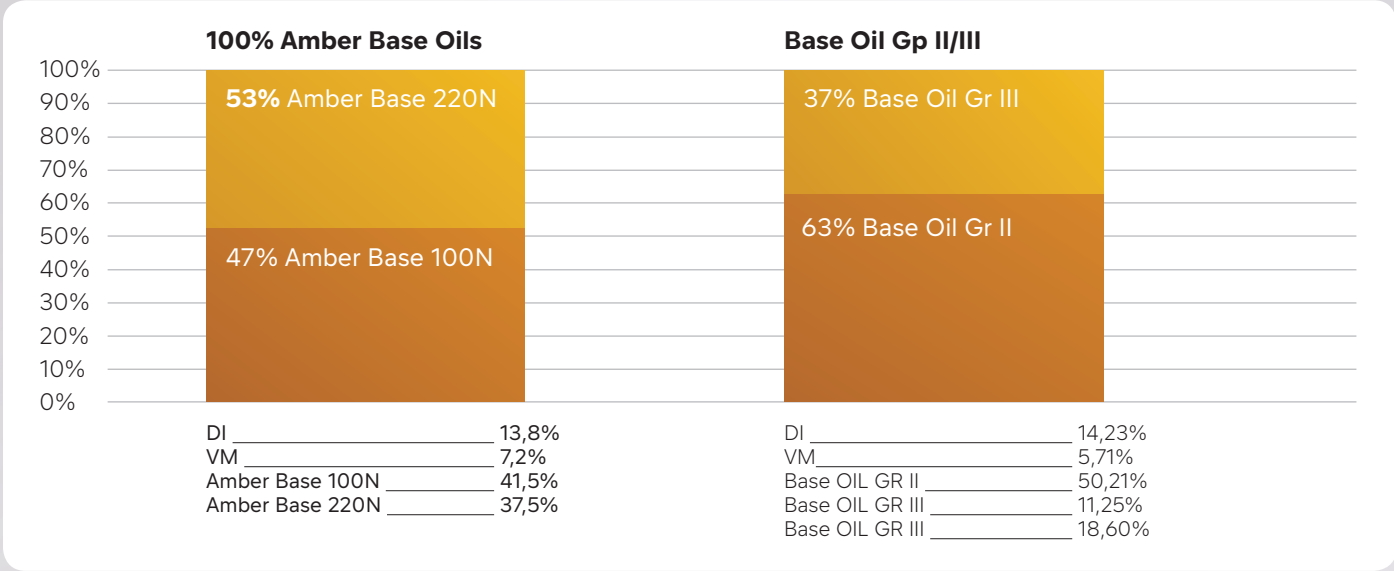


Reference Grease
Lithium NLGI-2 class with Gp I base oil

Tested Grease
Lithium NLGI-2 class with AMBER Base 1500 BS

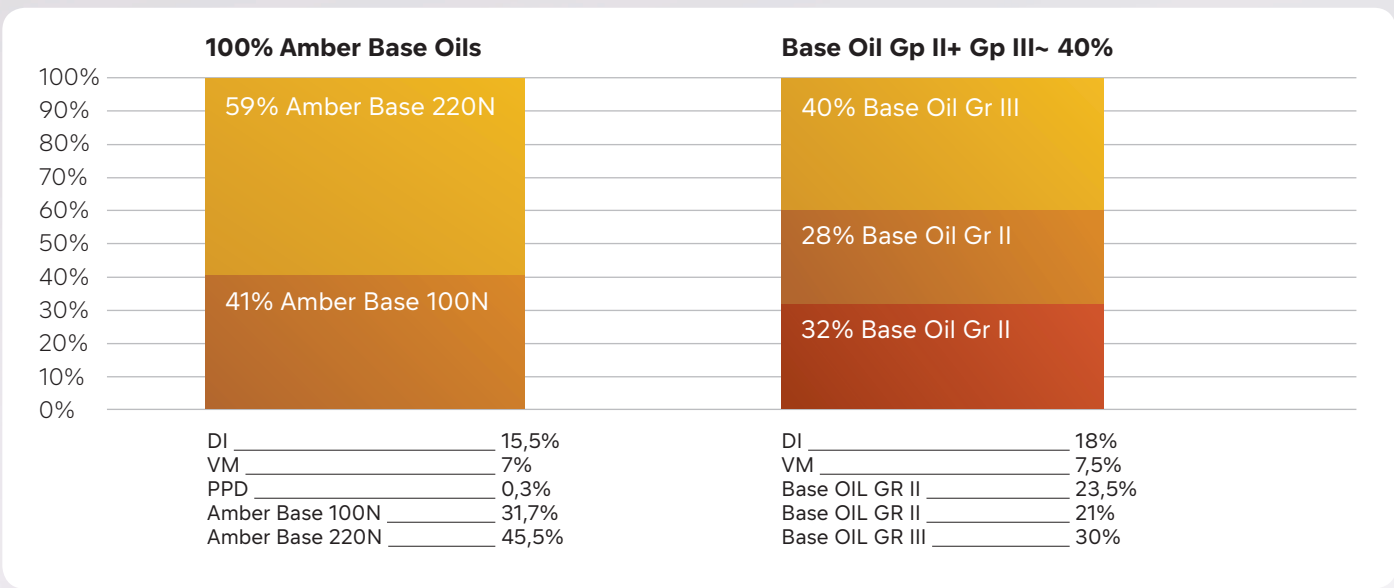
Increased water resistant as a function of temperature - five-fold increase in water resistance in dynamic conditions at high temperatures

Formulating Competitive Oil: HDDO 10W-30 (API CK-4)



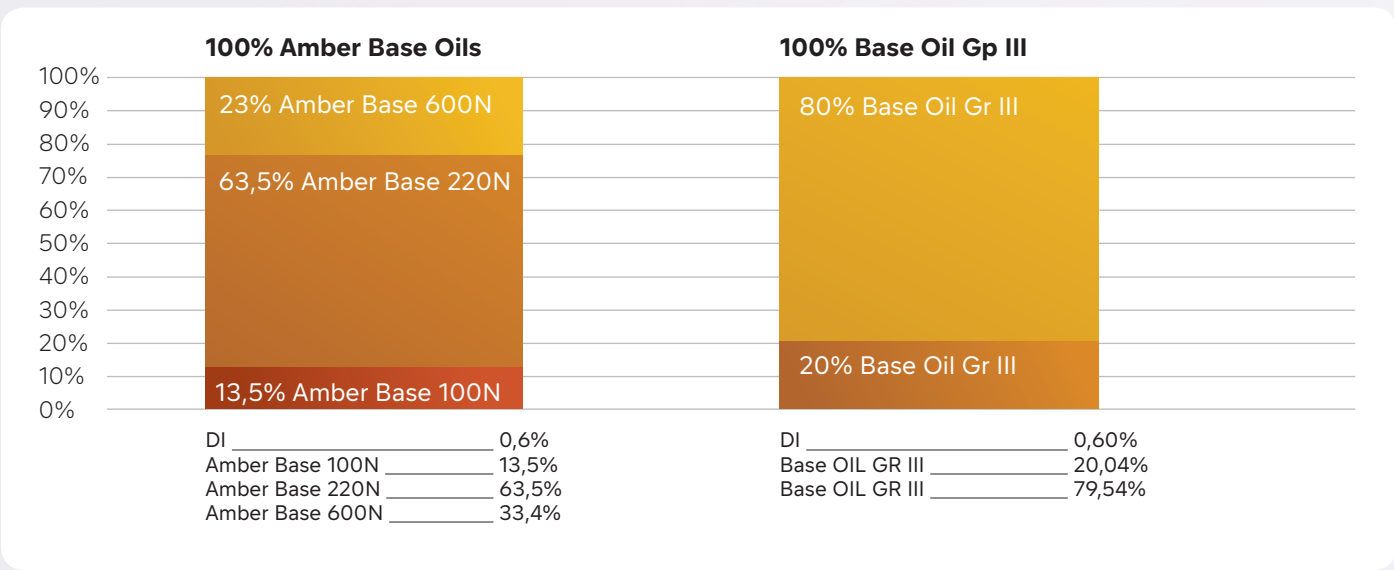
Benefits: · 0% Group III · 100% Group II · Potential to reduce Group III content by as much 37%

Formulating Competitive Oil: HDDO 10W-40 (ACEA E8)



Benefits: · 0% Group III · 100% Group II · Potential to reduce Group III content by as much 80%

Formulating Competitive Turbine Oil



Benefits: · 0% Group III · 100% Group II · Potential to reduce Group III content by as much 80%



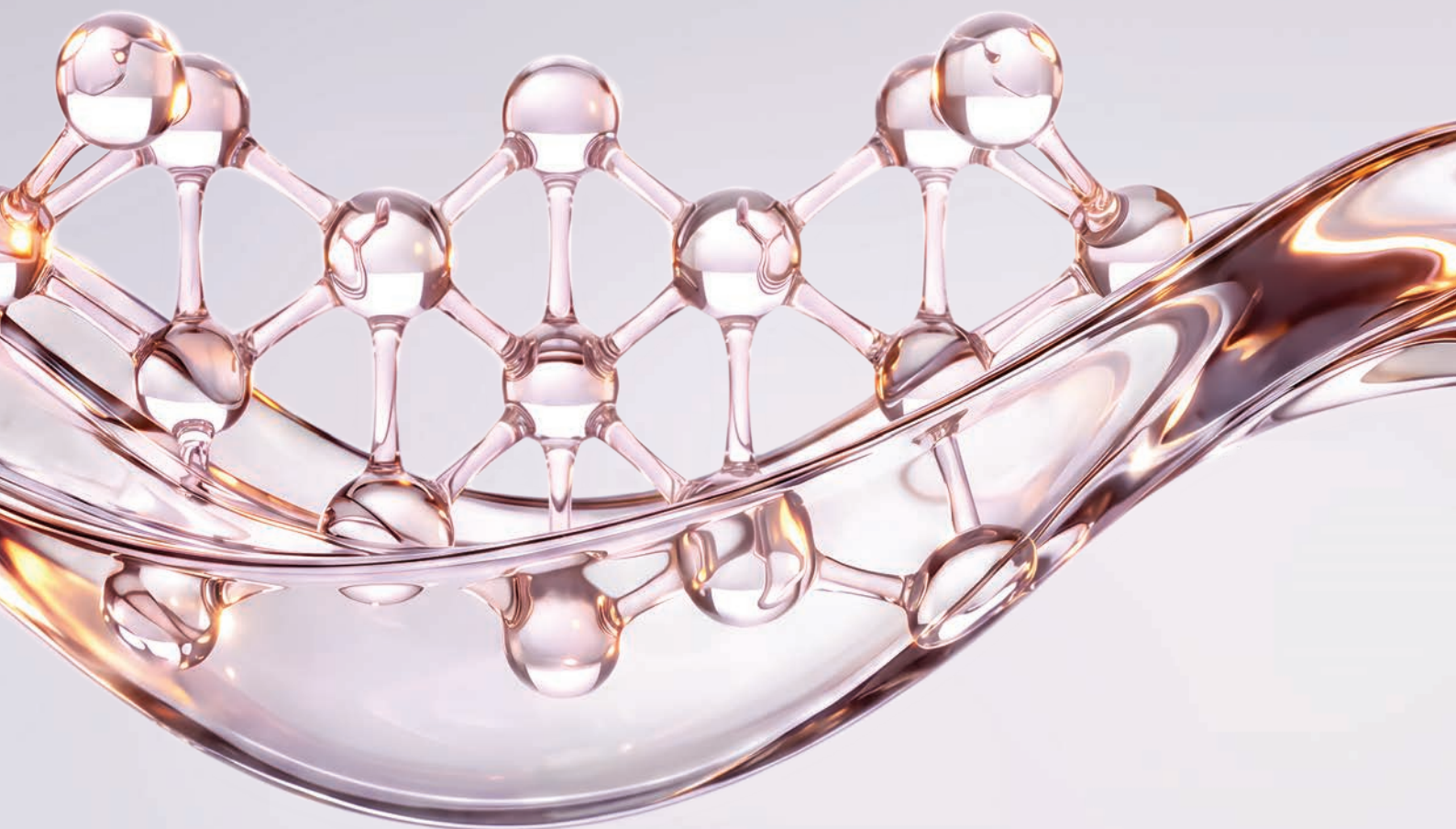


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