

LUBRICANTS REFERENCE HANDBOOK

Technical Guide to Lubricant Products,
Applications and Performance

N3

M.
Energo
— LUBRICANTS —

Performance | Protection | Reliability



AL RAHIM
Group of Companies

AL-NOOR PETROLEUM (PVT.) LIMITED

Energy & Lubrication Solutions Driven by Quality, Reliability and Performance

Al-Noor Petroleum (Pvt.) Limited (N3) is an Oil Marketing Company and a part of the Al Rahim Group of Companies, established to serve the evolving energy and petroleum requirements of customers across Pakistan. Operating under the N3 brand for petroleum fuels and the Energo brand for lubricants, the company provides a diversified portfolio of energy and lubrication solutions for automotive, industrial, commercial and specialized applications.

As part of the Al Rahim Group, Al-Noor Petroleum benefits from the Group's established experience and infrastructure in the petroleum and energy sectors. The company operates through an expanding supply, storage and distribution network designed to ensure reliable availability of petroleum products and lubricants across key markets. Its operations encompass petroleum fuel marketing, lubricant distribution, base oils and related petroleum products, supported by strategically positioned facilities and logistics capabilities.

Under the N3 brand, Al-Noor Petroleum markets a range of petroleum fuels serving the requirements of motorists, commercial operators, industries and other energy consumers. The company's fuel portfolio includes products such as Premium Motor Gasoline (PMG), High Speed Diesel (HSD) and other petroleum products, with quality and product consistency forming an important part of its operations.

The company's lubricant portfolio is marketed under the Energo brand, offering lubrication solutions for automotive and industrial applications. The Energo range includes automotive lubricants, industrial lubricants, industrial greases and automotive functional fluids, designed to support engines, transmissions, hydraulic systems, industrial machinery and a wide variety of operating environments.

Al-Noor Petroleum is also involved in the base-oil business, supplying base oils used in lubricant manufacturing and industrial applications.

Through Energo, Al-Noor Petroleum is committed to providing dependable lubrication solutions that support equipment protection, operational efficiency and reliable performance.

PART OF THE AL RAHIM GROUP

The Al Rahim Group began its journey in 1990 and has grown into a diversified business group with significant activities in liquid bulk storage, terminals, petroleum and petrochemical logistics and related sectors. Al-Noor Petroleum forms part of this broader industrial platform, benefiting from the Group's infrastructure, experience and established presence in petroleum-related businesses.

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AUTOMOTIVE LUBRICANTS

The Science of Protection, Performance and Reliability

Automotive lubricants are essential to the reliable operation and long service life of engines, transmissions, gear systems and hydraulic components. A properly selected lubricant does much more than simply reduce friction. It helps control wear, remove heat, keep components clean, protect against corrosion, maintain sealing, suspend contaminants and support the efficient operation of modern mechanical systems.

Al Noor Petroleum (Pvt.) Limited offers a comprehensive range of automotive lubricants under the ENERGO brand, covering motorcycle engine oils, petrol/gasoline engine oils, diesel engine oils, manual gear oils, automatic transmission fluids, CVT and DCT fluids, and automotive brake fluids.

Lubricant selection should always be based on the vehicle manufacturer's recommended viscosity, performance category and application requirements. SAE viscosity classification describes the rheological characteristics of an engine oil, while API and other industry classifications describe performance requirements. These are complementary systems rather than alternatives. SAE J300 specifically classifies engine oils in rheological terms and does not itself define overall lubricant performance.



UNDERSTANDING AUTOMOTIVE LUBRICANTS

More Than Friction Reduction

Inside an operating engine, hundreds of moving components interact under varying loads, speeds and temperatures. Pistons move rapidly within cylinders, bearings support rotating shafts, valve-train components operate under high contact pressures, and combustion generates significant heat and contamination.

Automotive lubricant is engineered to form a protective film between these surfaces while performing several additional functions simultaneously.

Principal Functions of Engine Oil

1. Lubrication

The primary function of engine oil is to reduce direct metal-to-metal contact between moving components. A stable lubricating film helps reduce friction and wear, supporting smooth mechanical operation.

2. Cooling

Engine oil carries heat away from highly loaded components such as pistons, bearings, valve-train components and turbocharger areas. The oil then releases this heat through the engine's lubrication and cooling system.

3. Cleaning and Contaminant Control

Modern engine oils contain detergent and dispersant systems that help control deposits and keep combustion-related contaminants suspended in the oil until they can be removed through filtration and oil changes.

4. Corrosion and Rust Protection

Moisture, acids and combustion by-products can contribute to corrosion. Properly formulated lubricants contain additives that help protect internal engine surfaces.

5. Sealing

Engine oil contributes to sealing between piston rings and cylinder walls, helping maintain compression and reduce the movement of combustion gases into the crankcase.

6. Wear Protection

Anti-wear and extreme-pressure chemistry helps protect components during conditions where the normal oil film may become thin or heavily loaded.

7. Oxidation and Deposit Control

Lubricants are exposed to high temperatures and oxygen during service. Oxidation can cause oil thickening, sludge and deposits. Antioxidant and detergent/dispersant systems help control these effects.

What Is Inside an Automotive Lubricant?

A finished lubricant normally consists of a base oil system combined with a carefully selected additive package.

Base Oils

Base oils provide the fundamental lubricating medium. Depending on the formulation and intended application, they may include mineral or synthetic base stocks and combinations thereof.

Base oil selection affects properties such as:

- Viscosity
- Low-temperature fluidity
- Oxidation resistance
- Volatility
- Thermal stability
- Solvency and additive compatibility

Additives

Additives are used to provide or enhance specific performance characteristics. Depending on the product, these may include:

- Detergents
- Dispersants
- Antioxidants
- Anti-wear agents
- Friction modifiers
- Viscosity-index improvers
- Pour-point depressants
- Corrosion inhibitors
- Anti-foam agents
- Extreme-pressure additives

The formulation must balance these components carefully. Increasing one characteristic does not automatically improve every other characteristic.

Lubricant Selection: Three Questions

Selecting the correct automotive lubricant can be simplified by considering three primary requirements:

01 — What type of vehicle or component?

Motorcycle, passenger car, commercial vehicle, differential, manual transmission, automatic transmission, CVT, DCT or braking system.

02 — What viscosity is required?

The SAE grade specified by the vehicle or equipment manufacturer should be followed.

03 — What performance classification is required?

Examples include:

API SP / SQ	for applicable gasoline engine oils
API CI-4 / CJ-4	for specified diesel applications
API GL-4 / GL-5	for gear oils
DOT 3 / DOT 4	for brake fluids

A lubricant should not be selected solely because its viscosity appears suitable. The required performance classification and application compatibility are equally important.



MOTORCYCLE ENGINE OILS

Specialized Lubrication for Two-Wheelers

Motorcycle engines operate under conditions that can differ significantly from passenger-car engines. High engine speeds, compact engine architecture, elevated operating temperatures and, in many motorcycles, a shared lubrication system for the engine, clutch and transmission place particular demands on the lubricant.

The correct motorcycle engine oil must therefore provide reliable lubrication while maintaining appropriate friction characteristics where the engine oil also operates in a wet clutch system.

Common motorcycle engine-oil viscosities include:

10W-40 | 20W-50

The appropriate grade depends on the motorcycle manufacturer's recommendation, ambient temperature, engine design and operating conditions.

Why Motorcycle Oils Are Different?

In many four-stroke motorcycles, the same lubricant may serve:

- Engine
- Clutch
- Transmission

This means the lubricant must provide wear protection while maintaining suitable friction characteristics for clutch engagement.

A lubricant that is appropriate for a passenger-car engine should therefore not automatically be assumed to be suitable for a motorcycle with a wet clutch.

SAE Grades for Motorcycles

SAE 10W-40

A multigrade oil designed to provide good low-temperature flow together with an SAE 40 operating-temperature viscosity.

The **10W** portion relates to low-temperature viscosity behavior, while the **40** portion identifies the high-temperature viscosity classification.

SAE 20W-50

A higher-viscosity multigrade oil commonly used in motorcycles where the manufacturer recommends this grade, particularly in warmer operating environments or in applications designed around higher-viscosity lubricants.

The actual selection should always follow the motorcycle manufacturer's recommendation.

API Service Categories

API gasoline-engine service categories use the "**S**" designation followed by a letter sequence. The sequence has evolved as engine technology and performance requirements have changed.

Examples include:

SG → SJ → SL → SM → SN → SP → SQ

API states that, for gasoline engines, newer service categories incorporate the performance properties of earlier categories and may be used where an earlier category is specified, subject to the vehicle manufacturer's recommendation.

API SP

API SP was introduced in May 2020 and addresses areas including low-speed pre-ignition protection, timing-chain wear, high-temperature deposits and sludge/varnish control.

API SQ

API SQ is the latest gasoline-engine service category and was introduced in March 2025. It adds further performance requirements, including protection against fresh and aged low-speed pre-ignition, timing-chain wear, high-temperature deposits, sludge and varnish, with applicable formulations also addressing fuel economy and emission-system protection.

JASO and Motorcycle Applications

For motorcycle oils, JASO classifications can also be important, particularly where the engine, clutch and transmission share the same lubricant. It includes:

JASO MA | JASO MA1 | JASO MA2 | JASO MB

PETROL / GASOLINE ENGINE OILS

Lubrication for Modern and Conventional Gasoline Engines

Gasoline engines operate through repeated combustion cycles that expose the lubricant to high temperatures, pressure, oxidation and combustion by-products. Modern engines add further challenges, including turbocharging, direct fuel injection, reduced oil viscosities, tighter component clearances and increasingly demanding emissions requirements.

A modern gasoline engine oil must therefore provide a carefully balanced combination of:

- Wear protection
- Deposit control
- Oxidation stability
- Sludge and varnish control
- Low-temperature pumpability
- Timing-chain protection
- LSPI protection where applicable
- Compatibility with emission-control systems
- Fuel-economy performance where required

API Gasoline Engine Oil Categories

API Service Categories for gasoline engines are identified by the letter S, historically referred to as the "Service" category.

The progression has included:

API Category	General Status / Application Era
SG	Legacy gasoline-engine category
SJ	Older gasoline engines
SL	2004 and older automotive engines
SM	2010 and older automotive engines
SN	2020 and older automotive engines
SN Plus	Additional protection against LSPI
SP	Current category
SQ	Latest category, introduced 2025

API's current guidance identifies SP and SQ as current gasoline categories, while earlier categories remain relevant for appropriate older applications.

Why API Categories Matter?

API categories are performance classifications rather than viscosity grades.

For example:

SAE 5W-30 tells us about viscosity classification.

API SP tells us about a defined level of engine-oil performance.

Therefore:

5W-30 and API SP answer two different questions.

The first concerns viscosity.

The second concerns performance.

Both need to be appropriate for the engine.

Understanding Modern API SP and SQ Performance

Modern gasoline engines can experience operating conditions that were less common in older engine designs.

Low-Speed Pre-Ignition — LSPI

LSPI is an abnormal combustion phenomenon that can occur in certain modern turbocharged, direct-injection gasoline engines operating at low speed and high load.

Modern engine-oil categories such as API SP and SQ include requirements designed to address LSPI-related protection.

Timing-Chain Wear

Modern gasoline-engine oils may also be required to provide enhanced timing-chain wear protection.

High-Temperature Deposits

Turbocharged engines can expose lubricant to severe thermal conditions. Modern categories therefore place greater emphasis on high-temperature deposit control.

Sludge and Varnish

Good detergent/dispersant and oxidation-control systems help maintain internal engine cleanliness.

SAE Gasoline Engine Oil Grades

Common gasoline-engine grades include:

0W-20 | 5W-30 | 10W-30 | 10W-40 | 20W-50

The correct grade is determined by the vehicle manufacturer's recommendation and operating conditions.

How to Read 5W-30?

Consider:

5W-30

5W

The "W" stands for **Winter**. The first number relates to the oil's low-temperature viscosity classification.

30

The second number identifies its high-temperature viscosity classification.

Therefore, 5W-30 is a multigrade oil designed to provide suitable low-temperature flow characteristics while retaining the viscosity behaviour associated with SAE 30 at operating temperature.

0W-20

Compared with 5W-30, a 0W-20 is classified for better low-temperature viscosity behaviour and a lower high-temperature viscosity grade.

This can support fuel-economy objectives in engines specifically designed for low-viscosity oils.

However:

A lower viscosity is not automatically a better viscosity.

The vehicle manufacturer's specified grade should always take priority.

DIESEL ENGINE OILS

Protection Under Load, Heat and Contamination

Diesel engines are commonly used in commercial vehicles, buses, trucks, agricultural equipment, construction machinery and other demanding applications.

Compared with many gasoline engines, diesel engines can generate significant soot and combustion by-products and may operate for extended periods under high load. Lubricants must therefore provide strong control of:

- Wear
- Soot handling
- Oxidation
- Deposit formation
- Oil thickening
- High-temperature degradation
- Corrosion
- Viscosity loss due to mechanical shear

Diesel engine oil selection is therefore closely linked to engine design, emissions technology, fuel quality, operating conditions and the manufacturer's specified service category.

API Diesel Categories

API diesel-engine service categories are identified primarily by the "C" designation.

Important categories represented across conventional and newer diesel applications include:

CF-4 → CH-4 → CI-4 → CJ-4 → CK-4

These categories reflect the progressive development of diesel engines, emissions requirements and lubricant performance expectations.

API CH-4

Introduced in 1998, CH-4 was developed for high-speed four-stroke diesel engines designed around the emissions requirements of that era.

API CI-4

Introduced in 2002, CI-4 addressed high-speed four-stroke diesel engines designed around 2004 emissions requirements and was particularly associated with engines using exhaust-gas recirculation (EGR).

API CJ-4

CJ-4 was developed for high-speed four-stroke diesel engines associated with 2010-era emissions requirements and advanced exhaust after-treatment systems. API describes CJ-4 as providing protection in areas including particulate-filter durability, engine wear, piston deposits, soot handling, oxidation stability and viscosity loss due to shear.

API CK-4

CK-4 is a newer diesel-engine category than CJ-4 and is intended for a range of modern high-speed four-stroke diesel engines. It should not simply be treated as interchangeable with every previous category in every application; the engine manufacturer's recommendation remains the controlling requirement. API specifically notes that diesel categories do not always have the same backward-compatibility relationship as gasoline categories.

Diesel Engine Oil and Soot Control

Diesel combustion produces soot and other combustion products that can enter the lubricant.

A suitable diesel engine oil uses detergent/dispersant chemistry and other formulation components to help manage these contaminants.

Poor soot control can contribute to:

- Oil thickening
- Deposit formation
- Wear
- Filter loading
- Reduced lubricant performance

This is one reason diesel-engine oil should be selected according to the correct engine specification rather than viscosity alone.

SAE Diesel Engine Oil Grades

10W-40 | 15W-40 | 20W-50 | SAE 40 | SAE 50

Multigrade Oils

Examples:

15W-40

20W-50

These provide a combination of low-temperature and operating-temperature viscosity characteristics.

Monograde Oils

Examples:

SAE 40 : SAE 50

These are single-grade classifications and may be appropriate for specific engines and operating conditions where the manufacturer recommends them.

ENERGO Automotive Product List

#	Product	Product Type	API	SAE
1	EnergO Speedom 1000	Motorcycle Engine Oil	SN	10W-40
2	EnergO Speedom 500	Motorcycle Engine Oil	SJ, SL	20W-50
3	EnergO Speedom 100	Motorcycle Engine Oil	SF, SG	20W-50
4	EnergO Optima Turbo	Petrol Engine Oil	SP, SQ	0W-20
5	EnergO Optima Ultra	Petrol Engine Oil	SN	5W-30
6	EnergO Optima Plus	Petrol Engine Oil	SM	10W-30, 10W-40
7	EnergO Optima	Petrol Engine Oil	SG, SJ	20W-50
8	EnergO Orload 500	Diesel Engine Oil	CJ-4	10W-40, 15W-40
9	EnergO Orload Plus	Diesel Engine Oil	CH-4	15W-40, 20W-50
10	EnergO Orload 400	Diesel Engine Oil	CF-4	15W-40, 20W-50
11	EnergO Orload 100	Diesel Engine Oil	CF/SF	SAE 40, SAE 50, 20W-50
12	EnergO HD 40	Diesel Engine Oil	CC/SD	SAE 40

ENERGO SPEEDOM 1000

Motorcycle Engine Oil

SAE 10W-40 | API SN

PRODUCT DESCRIPTION

Energo Speedom 1000 is a multigrade motorcycle engine oil formulated for modern four-stroke motorcycle engines requiring SAE 10W-40 viscosity and API SN-level performance. It is designed to provide dependable lubrication over a wide operating-temperature range, helping maintain engine cleanliness and protect critical engine components against wear, oxidation and deposits.

APPLICATIONS

- Four-stroke motorcycle engines
- Motorcycles requiring SAE 10W-40 engine oil
- Urban, highway and mixed riding conditions
- Applications specifying API SN or an earlier compatible category

KEY BENEFITS

- Excellent protection during cold starts
- Helps reduce engine wear
- Good high-temperature lubrication
- Helps control sludge and deposits
- Supports engine cleanliness
- Provides stable viscosity during operation

TECHNICAL PROPERTIES

Property	Typical Value
SAE Grade	10W-40
API Classification	SN
Kinematic Viscosity @ 40°C, cSt	90
Kinematic Viscosity @ 100°C, cSt	13.0
Viscosity Index	140
Density @ 15°C, kg/L	0.86
Flash Point, °C	220
Pour Point, °C	-38
TBN, mg KOH/g	6.5

ENERGO SPEEDOM 500

Motorcycle Engine Oil

SAE 20W-50 | API SJ / SL

PRODUCT DESCRIPTION

Energo Speedom 500 is a multigrade motorcycle engine oil designed for four-stroke motorcycle engines requiring SAE 20W-50 viscosity and API SJ/SL performance. Its formulation is intended to provide reliable lubrication, engine cleanliness and protection against wear under everyday and demanding riding conditions.

APPLICATIONS

- Four-stroke motorcycle engines
- Motorcycles requiring SAE 20W-50
- Daily commuting and highway operation
- Older and conventional motorcycle engine designs

KEY BENEFITS

- Strong lubricating oil film
- Effective wear protection
- Good high-temperature performance
- Helps control deposits and sludge
- Supports reliable engine operation

TECHNICAL PROPERTIES

Property	Typical Value
SAE Grade	20W-50
API Classification	SJ / SL
Kinematic Viscosity @ 40°C, cSt	145
Kinematic Viscosity @ 100°C, cSt	17.0
Viscosity Index	125
Density @ 15°C, kg/L	0.875
Flash Point, °C	225
Pour Point, °C	-18
TBN, mg KOH/g	7.0

ENERGO SPEEDOM 100

Motorcycle Engine Oil

SAE 20W-50 | API SF / SG

PRODUCT DESCRIPTION

Energo Speedom 100 is a multigrade motorcycle engine oil intended for four-stroke motorcycle engines requiring SAE 20W-50 viscosity and API SF/SG-level performance. It is designed to provide dependable lubrication and basic protection against wear, deposits and oxidation in compatible motorcycle applications.

APPLICATIONS

- Four-stroke motorcycle engines
- Older motorcycle models
- Applications requiring SAE 20W-50
- Compatible engines specifying API SF or SG performance

KEY BENEFITS

- Reliable engine lubrication
- Helps protect against wear
- Good high-temperature oil-film strength
- Helps maintain engine cleanliness
- Supports dependable everyday operation
- Suitable for conventional motorcycle applications

TECHNICAL PROPERTIES

Property	Typical Value
SAE Grade	20W-50
API Classification	SF / SG
Kinematic Viscosity @ 40°C, cSt	150
Kinematic Viscosity @ 100°C, cSt	17.0
Viscosity Index	120
Density @ 15°C, kg/L	0.880
Flash Point, °C	225
Pour Point, °C	-18
TBN, mg KOH/g	7.0

ENERGO OPTIMA TURBO

Petrol Engine Oil

SAE 0W-20 | API SP / SQ

PRODUCT DESCRIPTION

Energo Optima Turbo is a low-viscosity multigrade petrol engine oil designed for modern gasoline engines requiring SAE 0W-20 viscosity and API SP/SQ performance. Its formulation is designed to provide rapid oil circulation during cold starting while maintaining effective lubrication and protection at normal engine operating temperatures.

APPLICATIONS

- Modern gasoline/petrol engines
- Passenger cars and light-duty vehicles
- Engines requiring SAE 0W-20
- Applications specifying API SP or SQ performance

KEY BENEFITS

- Excellent low-temperature flow
- Rapid lubrication during cold starts
- Helps reduce friction and wear
- Supports engine cleanliness
- Good oxidation resistance
- Suitable for modern low-viscosity engine oil applications

TECHNICAL PROPERTIES

Property	Typical Value
SAE Grade	0W-20
API Classification	SP / SQ
Kinematic Viscosity @ 40°C, cSt	43
Kinematic Viscosity @ 100°C, cSt	8.3
Viscosity Index	160
Density @ 15°C, kg/L	0.835
Flash Point, °C	230
Pour Point, °C	-40
TBN, mg KOH/g	7.5

ENERGO OPTIMA ULTRA

Petrol Engine Oil

SAE 5W-30 | API SN

PRODUCT DESCRIPTION

Energo Optima Ultra is a multigrade petrol engine oil developed for gasoline engines requiring SAE 5W-30 viscosity and API SN performance. It is designed to provide effective lubrication during cold starts and normal operating conditions while helping protect engine components against wear, oxidation and deposits.

APPLICATIONS

- Petrol/gasoline passenger cars
- Light-duty gasoline engines
- Applications requiring SAE 5W-30
- Engines specifying API SN performance

KEY BENEFITS

- Excellent cold-start lubrication
- Helps reduce engine wear
- Good temperature stability
- Helps control sludge and deposits
- Supports engine cleanliness
- Provides reliable all-season lubrication

TECHNICAL PROPERTIES

Property	Typical Value
SAE Grade	5W-30
API Classification	SN
Kinematic Viscosity @ 40°C, cSt	55
Kinematic Viscosity @ 100°C, cSt	9.5
Viscosity Index	150
Density @ 15°C, kg/L	0.840
Flash Point, °C	225
Pour Point, °C	-40
TBN, mg KOH/g	7.0

ENERGO OPTIMA PLUS

Petrol Engine Oil

SAE 10W-30 / 10W-40 | API SM

PRODUCT DESCRIPTION

Energo Optima Plus is a multigrade petrol engine oil range designed for gasoline engines requiring SAE 10W-30 or SAE 10W-40 viscosity and API SM-level performance. It is formulated to provide reliable lubrication, wear protection, deposit control and performance across a broad range of driving conditions.

APPLICATIONS

- Petrol/gasoline passenger cars
- Light-duty gasoline vehicles
- Engines requiring SAE 10W-30 or 10W-40
- Urban, highway and mixed driving

KEY BENEFITS

- Good cold-start protection
- Helps reduce engine wear
- Effective deposit and sludge control
- Good thermal and oxidation stability
- Supports engine cleanliness
- Suitable for a wide range of operating conditions

TECHNICAL PROPERTIES

Property	Typical Value	Typical Value
SAE Grade	10W-30	10W-40
API Classification	SM	SM
Kinematic Viscosity @ 40°C, cSt	65	85
Kinematic Viscosity @ 100°C, cSt	10.5	12.5
Viscosity Index	140	140
Density @ 15°C, kg/L	0.850	0.855
Flash Point, °C	220	220
Pour Point, °C	-30	-30
TBN, mg KOH/g	6.5	6.5

ENERGO OPTIMA

Petrol Engine Oil

SAE 20W-50 | API SG / SJ

PRODUCT DESCRIPTION

Energo Optima is a multigrade petrol engine oil formulated for gasoline engines requiring SAE 20W-50 viscosity and API SG/SJ-level performance. It is intended to provide dependable lubrication and protection for compatible passenger-car and light-duty gasoline engines under normal operating conditions.

APPLICATIONS

- Petrol/gasoline engines
- Passenger cars and light-duty vehicles
- Older engine designs
- Applications requiring SAE 20W-50

KEY BENEFITS

- Strong oil-film protection
- Helps minimize engine wear
- Good high-temperature lubrication
- Helps control deposits
- Supports engine cleanliness
- Reliable performance under demanding conditions

TECHNICAL PROPERTIES

Property	Typical Value
SAE Grade	20W-50
API Classification	SG / SJ
Kinematic Viscosity @ 40°C, cSt	150
Kinematic Viscosity @ 100°C, cSt	17.0
Viscosity Index	125
Density @ 15°C, kg/L	0.880
Flash Point, °C	225
Pour Point, °C	-18
TBN, mg KOH/g	7.0

ENERGO ORLOAD 500

Heavy-Duty Diesel Engine Oil

SAE 10W-40 / 15W-40 | API CJ-4

PRODUCT DESCRIPTION

Energo Orload 500 is a heavy-duty diesel engine oil designed for diesel engines requiring API CJ-4 performance and SAE 10W-40 or 15W-40 viscosity. It is intended to provide reliable protection under demanding engine operating conditions while helping control deposits, oxidation and wear.

APPLICATIONS

- Heavy-duty diesel engines
- Commercial vehicles and trucks
- Buses and fleet vehicles
- Construction and industrial diesel equipment
- Applications requiring API CJ-4

KEY BENEFITS

- Strong protection against engine wear
- Good oxidation and thermal stability
- Helps control piston and engine deposits
- Supports engine cleanliness
- Good high-temperature lubrication

TECHNICAL PROPERTIES

Property	Typical Value	Typical Value
SAE Grade	10W-40	15W-40
API Classification	CJ-4	CJ-4
Kinematic Viscosity @ 40°C, cSt	90	105
Kinematic Viscosity @ 100°C, cSt	13.5	14.5
Viscosity Index	135–155	135
Density @ 15°C, kg/L	0.860	0.865
Flash Point, °C	225	230
Pour Point, °C	–30	–27
TBN, mg KOH/g	9	9

ENERGO ORLOAD PLUS

Heavy-Duty Diesel Engine Oil

SAE 15W-40 / 20W-50 | API CH-4

PRODUCT DESCRIPTION

Energo Orload Plus is a multigrade heavy-duty diesel engine oil intended for diesel engines requiring API CH-4 performance. Available in SAE 15W-40 and SAE 20W-50 grades, it provides dependable lubrication, wear protection and deposit control for commercial and heavy-duty applications.

APPLICATIONS

- Heavy-duty diesel engines
- Trucks and buses
- Commercial vehicle fleets
- Agricultural and construction equipment
- Compatible stationary diesel engines

KEY BENEFITS

- Helps protect against engine wear
- Good high-temperature oil-film strength
- Helps control deposits and sludge
- Supports engine cleanliness
- Good oxidation resistance
- Suitable for demanding diesel applications

TECHNICAL PROPERTIES

Property	Typical Value	Typical Value
SAE Grade	15W-40	20W-50
API Classification	CH-4	CH-4
Kinematic Viscosity @ 40°C, cSt	105	160
Kinematic Viscosity @ 100°C, cSt	14.5	18.0
Viscosity Index	125	120
Density @ 15°C, kg/L	0.865	0.880
Flash Point, °C	230	230
Pour Point, °C	-25	-18
TBN, mg KOH/g	9	9

ENERGO ORLOAD 400

Diesel Engine Oil

SAE 15W-40 / 20W-50 | API CF-4

PRODUCT DESCRIPTION

Energo Orload 400 is a diesel engine oil designed for compatible diesel engines requiring API CF-4 performance. The SAE 15W-40 and 20W-50 grades provide dependable lubrication for diesel engines operating under normal and demanding service conditions.

APPLICATIONS

- Diesel-powered commercial vehicles
- Trucks and buses
- Agricultural machinery
- Construction equipment
- Compatible older-generation diesel engines

KEY BENEFITS

- Helps protect against engine wear
- Provides good oil-film strength
- Helps control deposits
- Supports engine cleanliness
- Good thermal stability
- Reliable performance in demanding service

TECHNICAL PROPERTIES

Property	Typical Value	Typical Value
SAE Grade	15W-40	20W-50
API Classification	CF-4	CF-4
Kinematic Viscosity @ 40°C, cSt	105	165
Kinematic Viscosity @ 100°C, cSt	14.5	18.5
Viscosity Index	120	120
Density @ 15°C, kg/L	0.870	0.880
Flash Point, °C	225	225
Pour Point, °C	-21	-18
TBN, mg KOH/g	8	8

ENERGO ORLOAD 100

Diesel Engine Oil

SAE 40 / SAE 50 / 20W-50 | API CF / SF

PRODUCT DESCRIPTION

Energo Orload 100 is a diesel engine oil range comprising SAE 40, SAE 50 and SAE 20W-50 grades for compatible diesel-engine applications. The range is designed to provide dependable lubrication and protection for engine components operating under conventional service conditions.

APPLICATIONS

- Diesel engines requiring SAE 40, SAE 50 or 20W-50
- Commercial and agricultural equipment
- Older-generation diesel engines
- Stationary diesel applications where applicable
- Compatible applications requiring API CF/SF-level performance

KEY BENEFITS

- Reliable engine lubrication
- Helps reduce wear
- Good high-temperature protection
- Helps control engine deposits
- Supports dependable engine operation
- Available in multiple viscosity grades

TECHNICAL PROPERTIES

Property	Typical Value	Typical Value	Typical Value
SAE Grade	40	50	20W-50
API Classification	CF / SF	CF / SF	CF / SF
Kinematic Viscosity @ 40°C, cSt	95	150	165
Kinematic Viscosity @ 100°C, cSt	13.0	18.5	18.5
Viscosity Index	100	105	120
Density @ 15°C, kg/L	0.880	0.880	0.885
Flash Point, °C	230	235	230
Pour Point, °C	-9	-9	-18
TBN, mg KOH/g	5	5	7

ENERGO HD 40

Heavy-Duty Diesel Engine Oil

SAE 40 | API CC/SD

PRODUCT DESCRIPTION

Energo HD 40 is a monograde diesel engine oil designed for compatible diesel engines requiring SAE 40 viscosity and API CC/SD-level performance. It is intended for conventional engine applications where a monograde lubricant is specified and provides reliable lubrication and protection under normal operating conditions.

APPLICATIONS

- Compatible diesel engines requiring SAE 40
- Older-generation diesel equipment
- Agricultural and industrial machinery
- Stationary diesel engines
- Applications specifying API CC/SD-level performance

KEY BENEFITS

- Reliable monograde lubrication
- Helps protect engine components against wear
- Good high-temperature oil-film strength
- Helps control deposits
- Supports dependable engine operation
- Suitable for compatible conventional applications

TECHNICAL PROPERTIES

Property	Typical Value
SAE Grade	40
API Classification	CC/SD
Kinematic Viscosity @ 40°C, cSt	95
Kinematic Viscosity @ 100°C, cSt	13.0
Viscosity Index	100
Density @ 15°C, kg/L	0.875
Flash Point, °C	230
Pour Point, °C	-9
TBN, mg KOH/g	5

AUTOMOTIVE FUNCTIONAL FLUIDS

Protection, Performance and Reliability for Modern Vehicles

Automotive functional fluids are specialized fluids, additives and maintenance chemicals designed to perform specific functions within a vehicle beyond the primary lubrication provided by engine oil. They play an important role in the operation, protection, cleanliness, cooling and performance of critical automotive systems.

The correct functional fluid helps individual components operate efficiently while reducing wear, controlling deposits, protecting against corrosion and maintaining system reliability.

Functional fluids are used throughout the vehicle, including manual and automatic transmissions, continuously variable transmissions (CVTs), dual-clutch transmissions (DCTs), hydraulic brake systems, engine cooling systems and fuel systems. Specialized maintenance products are also used to clean engines, fuel injectors and exhaust-system components, while fuel additives can be used to improve selected fuel characteristics.

Correct product selection is particularly important because different automotive systems require different chemical and physical properties. A manual gear lubricant, for example, requires strong load-carrying and anti-wear performance, while an automatic transmission fluid must provide carefully controlled friction and hydraulic characteristics. Similarly, brake fluid must maintain reliable hydraulic performance at elevated temperatures, whereas coolant must provide effective heat transfer together with protection against corrosion and freezing.



Manual Gear Oils

Manual gear oils are designed to lubricate gears, bearings and related components in manual transmissions, differentials and final drives. They form a protective film between moving metal surfaces, helping reduce friction, wear, scuffing and surface damage under varying loads.

Gear oils are available in different viscosity grades and performance classifications. API GL-4 lubricants are commonly used in applications where moderate extreme-pressure performance and synchronizer compatibility are required, while API GL-5 lubricants provide a higher level of extreme-pressure protection for suitable heavily loaded gear applications.

Choosing the correct grade is essential because viscosity and additive chemistry must match the transmission or differential manufacturer's requirements.

Automatic Transmission Fluids

Automatic transmission fluids (ATF) perform several functions simultaneously. They lubricate gears and bearings, transfer hydraulic pressure, control clutch and band engagement, remove heat and provide controlled friction characteristics for smooth shifting.

Unlike conventional gear oils, ATFs are highly application-specific. Different transmission designs may require different friction characteristics, viscosity levels and additive systems. Examples of commonly encountered specifications include DEX-III, Toyota Type IV and Honda DW-1.

The correct specification should always be confirmed against the vehicle manufacturer's requirements.

CVT Fluids

Continuously variable transmissions use a different operating principle from conventional automatic transmissions and therefore require specially formulated CVT fluids.

CVT fluid provides lubrication while also controlling the frictional behaviour of the transmission's belt, chain, pulleys and clutch components. It must maintain suitable friction characteristics, viscosity and thermal stability over a wide range of operating conditions.

CVT fluids are highly application-specific, with different vehicle manufacturers requiring different fluid formulations. Examples include FE, TC and HCF-2 applications.

DCT Fluids

Dual-clutch transmissions combine mechanical gears with electronically or hydraulically controlled clutch systems. Their operating conditions require specialized fluid characteristics to provide lubrication, cooling and controlled clutch friction.

DCT fluids help protect gears, bearings and clutch components while supporting smooth engagement and gear changes. Because DCT designs differ significantly between manufacturers, the fluid specification should always be verified before application.

Brake Fluids

Brake fluid is a hydraulic medium used to transmit pressure from the brake pedal to the braking mechanism. It is a safety-critical fluid because reliable braking depends on consistent hydraulic performance.

Brake fluids must maintain appropriate viscosity across a wide temperature range and provide sufficient resistance to vaporization under high-temperature braking conditions. They must also be compatible with seals, hoses and other brake-system materials.

Common classifications include DOT 3 and DOT 4, with the required grade determined by the vehicle manufacturer and braking-system design.

Brake fluid is hygroscopic to varying degrees, meaning it can absorb moisture over time. Moisture contamination can reduce boiling performance, which is why brake-fluid condition and replacement intervals are important aspects of vehicle maintenance.

Engine & Mechanical Maintenance Fluids

Engine Degreasers

Engine degreasers are external cleaning products used to remove oil, grease, dirt and accumulated grime from engine compartments and suitable mechanical components.

Keeping external engine surfaces clean can make leaks, damaged components and maintenance issues easier to identify. Degreasing also helps remove accumulated contaminants that can interfere with inspection and routine workshop servicing.

These products should be used according to their compatibility with painted surfaces, plastics, rubber components and electrical/electronic parts.

Engine Flushes

Engine flush products are used during oil-change servicing to assist in loosening and removing accumulated sludge, varnish and oil-related contaminants from suitable internal engine surfaces.

A clean internal oil system can support better circulation of fresh lubricant and help reduce the effects of accumulated deposits. Engine flushes are generally used immediately before an oil change rather than as a replacement for engine oil.

Their use should be based on the engine manufacturer's recommendations and the condition of the engine. Excessive sludge accumulation may require mechanical inspection or cleaning rather than relying solely on a chemical flush.

Fuel-System & Combustion Treatments

Petrol / Gasoline System Cleaners

Petrol-system cleaners are fuel additives designed to help control and remove suitable deposits from fuel-system components such as injectors and other fuel-delivery components.

Clean fuel-system components can help maintain consistent fuel delivery and proper fuel atomization. This may support smooth engine operation and efficient combustion.

These products are generally added directly to the fuel tank at a specified dosage and are intended primarily for preventive maintenance and deposit control.

Diesel Injector & System Cleaners

Diesel fuel-system cleaners are formulated to assist in maintaining cleanliness in diesel injectors and related fuel-system components.

Deposit formation can affect injector spray patterns and fuel atomization, potentially influencing combustion quality, engine response and fuel consumption. Cleaning treatments can help maintain injector cleanliness when used at the recommended dosage.

They are particularly useful as part of preventive maintenance programs for passenger cars, commercial vehicles and fleet applications.

Catalytic Converter Cleaners

Catalytic-converter cleaning treatments are designed to assist in controlling suitable combustion and exhaust-system deposits associated with vehicle operation.

Maintaining a clean fuel and combustion system can contribute to proper exhaust-system operation. Such products may be used as a maintenance treatment in compatible vehicles.

However, chemical cleaning products cannot repair a physically damaged, melted, structurally failed or severely blocked catalytic converter. Persistent engine-warning or emissions-system faults should be properly diagnosed before treatment.

Cooling-System Fluids

Antifreeze & Coolants

Engine coolant performs two essential functions: heat transfer and cooling-system protection.

It circulates through the engine and radiator to remove excess heat generated during combustion. At the same time, an appropriate coolant formulation can provide protection against freezing, boiling, corrosion and deposits within compatible cooling-system components.

Coolants may be supplied as concentrates or ready-to-use mixtures. Concentrated products require dilution according to the manufacturer's specified concentration, normally using suitable-quality water.

Different coolant technologies may use different corrosion-inhibitor systems. Coolant color should not be used as the sole method of determining compatibility.

Fuel Performance Additives

Octane Boosters

Octane boosters are petrol-fuel additives designed to increase the octane quality of compatible gasoline.

Octane quality is related to a fuel's resistance to abnormal combustion or knock. Increasing octane may be beneficial in applications where the existing fuel does not meet the engine's required octane level.

The effectiveness of an octane booster depends on its chemistry, dosage and the starting quality of the fuel. Recommended dosage limits should always be followed.

Cetane Boosters

Cetane boosters are diesel-fuel additives designed to increase the cetane quality of compatible diesel fuel.

Cetane quality is associated with ignition characteristics in compression-ignition engines. Improving cetane quality can support easier ignition and smoother combustion under suitable operating conditions.

Cetane boosters are generally added directly to diesel fuel at a controlled treatment rate. They should be considered a fuel-performance supplement rather than a replacement for correct engine maintenance or quality diesel fuel.



ENERGO ENERGEAR SERIES

Manual Gear Oil – API GL-4

PRODUCT DESCRIPTION

Energo Energear Series is a manual transmission and gear lubricant formulated for applications requiring API GL-4 performance. It is designed to provide effective lubrication, anti-wear protection and reliable gear operation under varying loads and operating temperatures.

APPLICATIONS

- Manual transmissions, Gearboxes, Transaxles
- Differentials and final drives where GL-4 is specified
- Automotive and commercial vehicle gear systems

KEY BENEFITS

- Effective lubrication of gears and bearings
- Helps protect against wear and scuffing
- Good thermal and oxidation stability
- Supports smooth gear operation

TYPICAL CHARACTERISTICS

Property	75W-90*	85W-140*	SAE 90*	SAE 140*
API Performance	GL-4	GL-4	GL-4	GL-4
Appearance	Clear, uniform	Clear, uniform	Clear, uniform	Clear, uniform
Density @ 15°C, g/cm ³	0.87–0.90	0.88–0.92	0.88–0.91	0.89–0.93
Viscosity @ 40°C, cSt	85–120	180–300	140–190	300–450
Viscosity @ 100°C, cSt	14–18	24–30	14–18	28–35
Viscosity Index	140–190	90–130	90–120	90–120
Flash Point, °C	190–220	200–230	190–220	200–230
Pour Point, °C	–35 to –50	–15 to –30	–15 to –30	–10 to –25

*Typical/indicative values.

ENERGO ENERGEAR SERIES

Manual Gear Oil – API GL-5

PRODUCT DESCRIPTION

Energo Energear Series is a high-performance gear lubricant formulated for automotive and mechanical gear systems requiring **API GL-5** performance. It is designed to provide strong extreme-pressure, anti-wear and load-carrying protection for gears operating under demanding conditions.

APPLICATIONS

- Differentials
- Final drives
- Hypoid gear sets
- Manual transmissions where GL-5 is specified
- Automotive and commercial vehicle gear systems

KEY BENEFITS

- High-load gear protection
- Excellent extreme-pressure capability
- Helps reduce wear and surface damage

TYPICAL CHARACTERISTICS

Property	75W-90*	85W-140*	SAE 90*	SAE 140*
API Performance	GL-5	GL-5	GL-5	GL-5
Appearance	Clear, uniform	Clear, uniform	Clear, uniform	Clear, uniform
Density @ 15°C, g/cm ³	0.86–0.90	0.88–0.92	0.88–0.91	0.89–0.93
Viscosity @ 40°C, cSt	90–125	180–320	140–200	300–450
Viscosity @ 100°C, cSt	15–18	24–32	15–18	28–35
Viscosity Index	140–190	90–130	90–120	90–120
Flash Point, °C	190–220	200–230	190–220	200–230
Pour Point, °C	–35 to –50	–15 to –30	–15 to –30	–10 to –25

*Typical/indicative values.

ENERGO ATF

Automatic Transmission Fluid

PRODUCT DESCRIPTION

Energo ATF is a range of automatic transmission fluids designed for compatible automatic transmission systems requiring specific ATF performance. The range includes formulations intended for applications referencing DEX-III, Type IV and DW-1 requirements.

APPLICATIONS

- Automatic transmissions & transaxles
- Compatible hydraulic transmission systems & power-steering systems

KEY BENEFITS

- Supports smooth transmission operation
- Controlled friction characteristics
- Helps protect gears, bearings and hydraulic components

TYPICAL CHARACTERISTICS

Property	Typical Value*
Appearance	Clear, bright liquid
Colour	Red
Density @ 15°C, g/cm ³	0.84–0.86
Viscosity @ 40°C, cSt	25–36
Viscosity @ 100°C, cSt	6.0–7.5
Viscosity Index	160–200+
Flash Point, °C	180–220
Pour Point, °C	–40 to –50
Copper Corrosion	Typically 1b or better

*Typical/indicative values.

ENERGO TRANSMATIC CVT

Continuously Variable Transmission Fluid

PRODUCT DESCRIPTION

Energo Transmatic CVT is a specialized transmission fluid range developed for compatible continuously variable transmission (CVT) systems. CVTs require carefully controlled friction, viscosity and thermal properties to support the operation of belts, chains, pulleys and associated hydraulic components.

APPLICATIONS

- Continuously Variable Transmissions, references include FE, TC and HCF-2
- CVT transaxles
- Compatible automotive CVT systems

KEY BENEFITS

- Controlled friction characteristics
- Supports smooth CVT operation
- Helps protect transmission components from wear

TYPICAL CHARACTERISTICS

Property	Typical Value*
Appearance	Clear, bright liquid
Colour	Red/amber, formulation dependent
Density @ 15–20°C, g/cm ³	0.84–0.86
Viscosity @ 40°C, cSt	24–34
Viscosity @ 100°C, cSt	6.0–7.3
Viscosity Index	180–265
Brookfield Viscosity @ –40°C, mPa·s	2,500–14,000
Flash Point, °C	180–210
Pour Point, °C	–45 to –55

*Typical/indicative values.

ENERGO TRANSMATIC DCT

Dual Clutch Transmission Fluid

PRODUCT DESCRIPTION

Energo Transmatic DCT is a specialized transmission fluid for compatible Dual Clutch Transmission (DCT) systems. It provides lubrication, cooling and controlled friction for transmission components and clutch systems operating under demanding conditions.

APPLICATIONS

- Compatible wet-clutch DCT systems
- DCT transmissions
- DCT gear and hydraulic systems where specified

KEY BENEFITS

- Controlled clutch friction
- Gear and bearing lubrication
- Helps protect against wear
- Good thermal stability

TYPICAL CHARACTERISTICS

Property	Typical Value*
Appearance	Clear, bright liquid
Colour	Amber
Density @ 15°C, g/cm ³	0.84–0.86
Viscosity @ 40°C, cSt	32–38
Viscosity @ 100°C, cSt	6.8–7.5
Viscosity Index	170–180
Flash Point, °C	195–210
Pour Point, °C	–40 to –50

*Typical/indicative values.

ENERGO BRAKE OIL

Automotive Brake Fluid – DOT 3 / DOT 4

PRODUCT DESCRIPTION

Energo Brake Oil is a hydraulic brake fluid available in **DOT 3 and DOT 4** grades for compatible automotive braking systems. It is designed to transmit hydraulic pressure reliably while maintaining suitable performance across a broad range of operating temperatures.

APPLICATIONS

- Disc brake systems
- Drum brake systems

KEY BENEFITS

- Reliable hydraulic pressure transmission
- High-temperature performance
- Suitable viscosity characteristics
- Helps protect compatible brake-system materials
- Good low-temperature fluidity
- Suitable for compatible DOT 3/DOT 4 systems

TYPICAL CHARACTERISTICS

Property	DOT 3*	DOT 4*
Appearance	Clear to amber	Clear to amber
Base Chemistry	Glycol ether	Glycol ether / borate ester
Dry Boiling Point, °C	220–240	250–270
Wet Boiling Point, °C	140–155	155–165
Viscosity @ –40°C, cSt	≤1,500	≤1,500–1,800
Viscosity @ 100°C, cSt	1.5–2.2	1.5–2.4
pH	7–11	7–11
Copper Corrosion	Controlled	Controlled

*Typical/indicative values.

ENERGO DEGREASER

Engine & Mechanical Degreaser

PRODUCT DESCRIPTION

Energo Degreaser is an automotive cleaning and degreasing solution designed to help remove oil, grease, dirt and accumulated grime from suitable external engine and mechanical surfaces.

It is intended for workshop, fleet and general automotive maintenance applications.

APPLICATIONS

- External engine cleaning
- Engine-bay maintenance
- Workshop equipment
- Oil- and grease-contaminated surfaces

KEY BENEFITS

- Helps dissolve and remove oil and grease
- Assists removal of accumulated grime
- Supports cleaner engine compartments
- Helps make leaks and maintenance issues easier to identify

TYPICAL CHARACTERISTICS

Property	Typical Value*
Appearance	Clear to slightly hazy liquid
Colour	Colourless to light yellow
Odour	Characteristic cleaner/solvent odour
Density @ 20°C, g/cm ³	0.90–1.05
pH	8–11*
Water Solubility	Miscible/dispersible*
Flash Point	Formulation dependent

*Typical/indicative values.

ENERGO FLUSH OIL

Engine Cleaning & Flush Treatment

PRODUCT DESCRIPTION

Energo Flush Oil is an engine-cleaning treatment designed to assist in loosening and removing accumulated oil sludge, varnish and other contaminants during routine engine-oil servicing.

It is used before an oil change to help clean the internal oil system and prepare the engine for fresh lubricant.

APPLICATIONS

- Petrol engines
- Diesel engines
- Automotive engine oil systems where compatible

KEY BENEFITS

- Helps loosen sludge and deposits
- Supports cleaner internal engine surfaces
- Helps remove oil-related contaminants

TYPICAL CHARACTERISTICS

Property	Typical Value*
Appearance	Clear to slightly hazy liquid
Colour	Amber/light brown
Density @ 20°C, g/cm ³	0.84–0.90
Viscosity @ 40°C, cSt	10–25
Flash Point, °C	80–150
Pour Point, °C	–20 to –40
Odour	Mild hydrocarbon/solvent
Water Solubility	Insoluble/limited

*Typical/indicative values.

ENERGO PES CLEANER

Petrol / Gasoline Fuel-System Cleaner

PRODUCT DESCRIPTION

Energo PES Cleaner is a petrol-fuel-system treatment designed to assist in controlling and removing suitable deposits from fuel-system components.

Regular fuel-system cleanliness can help maintain consistent fuel delivery and injector performance and support efficient combustion.

APPLICATIONS

- Petrol/gasoline engines
- Fuel injectors
- Fuel-system components
- Passenger cars & Motorcycles
- Compatible petrol-powered equipment

KEY BENEFITS

- Helps control fuel-system deposits
- Supports injector cleanliness
- Helps maintain consistent fuel delivery

TYPICAL CHARACTERISTICS

Property	Typical Value*
Appearance	Clear liquid
Colour	Colourless to amber
Density @ 20°C, g/cm ³	0.75–0.90
Flash Point, °C	20–60+
Odour	Characteristic hydrocarbon/solvent
Fuel Compatibility	Petrol/gasoline
Treatment Rate	Formulation dependent

*Typical/indicative values.

ENERGO DES CLEANER

Diesel Fuel-System & Injector Cleaner

PRODUCT DESCRIPTION

Energo DES Cleaner is a diesel fuel-system treatment designed to assist in controlling and removing suitable deposits from fuel injectors and related fuel-system components.

Maintaining injector cleanliness helps support consistent fuel delivery and fuel atomization.

APPLICATIONS

- Diesel passenger vehicles
- Commercial vehicles
- Light-duty and heavy-duty diesel engines
- Diesel fuel systems
- Injector maintenance

KEY BENEFITS

- Helps clean injector deposits
- Supports fuel-system cleanliness
- Helps maintain consistent fuel delivery

TYPICAL CHARACTERISTICS

Property	Typical Value*
Appearance	Clear liquid
Colour	Colourless to amber
Density @ 20°C, g/cm ³	0.78–0.90
Flash Point, °C	30–70+
Odour	Characteristic hydrocarbon/solvent
Fuel Compatibility	Diesel
Treatment Rate	Formulation dependent

*Typical/indicative values.

ENERGO CC CLEANER

Catalytic Converter & Exhaust-System Cleaning Treatment

PRODUCT DESCRIPTION

Energo CC Cleaner is an automotive fuel-system and exhaust maintenance treatment designed to assist in controlling suitable combustion-related deposits associated with exhaust-system operation.

APPLICATIONS

- Compatible petrol/gasoline vehicles
- Catalytic-converter maintenance
- Exhaust-system deposit management
- Preventive fuel-system maintenance

KEY BENEFITS

- Helps control suitable combustion-related deposits
- Supports exhaust-system cleanliness
- Convenient preventive maintenance treatment
- Suitable for compatible fuel systems

TYPICAL CHARACTERISTICS

Property	Typical Value*
Appearance	Clear liquid
Colour	Colourless to amber
Density @ 20°C, g/cm ³	0.75–0.95
Flash Point, °C	20–70+
Odour	Characteristic solvent/fuel additive
Water Solubility	Limited/formulation dependent
Fuel Compatibility	Petrol/gasoline, where specified
Treatment Rate	Formulation dependent

*Typical/indicative values.

ENERGO COOLANT

Antifreeze / Summer Coolant

PRODUCT DESCRIPTION

Energo Coolant is an automotive engine coolant designed to assist in heat transfer and cooling-system protection. Depending on formulation and concentration, it can provide protection against overheating, freezing, corrosion and deposits within compatible cooling systems.

APPLICATIONS

- Passenger cars, SUVs
- Light commercial vehicles
- Compatible petrol & diesel engines
- Automotive cooling systems

KEY BENEFITS

- Supports efficient engine heat transfer
- Helps protect cooling-system components against corrosion
- Provides antifreeze protection when correctly diluted
- Helps protect against overheating
- Supports cooling-system cleanliness

TYPICAL CHARACTERISTICS

Property	Concentrate / Typical	50% Dilution Reference
Appearance	Clear, uniform	Clear, uniform
Colour	Formulation dependent	Formulation dependent
Density @ 20°C, g/cm ³	1.05–1.15	1.05–1.08
pH	7.5–11	7.5–11
Boiling Point, °C	~160–170*	≥108
Freezing Point	Concentration dependent	Approx. –36°C
Water Content	Formulation dependent	Approx. 50%

*Typical range for glycol-based concentrate; exact value depends on formulation.

ENERGO O BOOSTER

Petrol Octane Booster

PRODUCT DESCRIPTION

Energo O Booster is a petrol fuel additive designed to increase the octane quality of compatible gasoline when used at the recommended dosage.

Octane quality is associated with a fuel's resistance to abnormal combustion or engine knock. The product is intended for applications where additional octane performance may be required.

APPLICATIONS

- Petrol/gasoline engines
- Passenger cars
- Motorcycles
- Compatible petrol-powered vehicles and equipment

KEY BENEFITS

- Helps increase petrol octane quality
- Supports resistance to knock where applicable
- Convenient fuel-tank application

TYPICAL CHARACTERISTICS

Property	Typical Value*
Appearance	Clear to amber liquid
Colour	Colourless to amber
Density @ 20°C, g/cm ³	0.80–1.00
Flash Point, °C	20–70+
Odour	Characteristic solvent/fuel additive
Solubility in Petrol	Complete/compatible
Treatment Rate	Formulation dependent

*Typical/indicative values.

ENERGO C BOOSTER

Diesel Cetane Booster

PRODUCT DESCRIPTION

Energo C Booster is a diesel fuel additive designed to improve the cetane quality of compatible diesel fuel when used at the recommended dosage.

Cetane quality is associated with ignition characteristics in compression-ignition engines. Improving cetane quality can support ignition and smoother combustion under suitable operating conditions.

APPLICATIONS

- Diesel passenger vehicles
- Commercial vehicles
- Compatible diesel engines
- Preventive fuel treatment

KEY BENEFITS

- Helps increase diesel cetane quality
- May contribute to smoother combustion
- Convenient fuel-tank application
- Suitable for preventive fuel treatment

TYPICAL CHARACTERISTICS

Property	Typical Value*
Appearance	Clear to amber liquid
Colour	Colourless to amber
Density @ 20°C, g/cm ³	0.80–1.00
Flash Point, °C	20–70+
Solubility in Diesel	Complete/compatible
Treatment Rate	Formulation dependent
Cetane Improvement	Dosage/formulation dependent

*Typical/indicative values.

INDUSTRIAL LUBRICANTS

Reliable Lubrication for Industry, Machinery & Process Equipment

Industrial lubricants are specially formulated fluids designed to protect machinery, control friction, remove heat and maintain reliable operation under demanding industrial conditions. Unlike automotive lubricants, which are primarily designed around vehicle engines, transmissions and vehicle systems, industrial lubricants are selected according to the design, operating conditions and lubrication method of specific machinery.

Industrial equipment may operate continuously for thousands of hours under high loads, elevated temperatures, high rotational speeds, pressure, vibration, dust, moisture and other contaminants. The lubricant therefore becomes an essential part of the machine's operating system. Proper lubricant selection can reduce friction and wear, protect components against corrosion, improve heat dissipation, control deposits and help extend equipment service life.

The industrial lubricant portfolio covers a broad range of applications including hydraulic systems, circulating systems, machine tools, compressors, vacuum pumps, industrial gearboxes, refrigeration equipment, textile machinery, electrical transformers, metalworking operations, rubber processing and sugar-mill machinery.



The Role of Industrial Lubricants

Industrial lubricants perform several important functions simultaneously.

Friction & Wear Control

Lubricants form a protective film between moving surfaces, reducing direct metal-to-metal contact. This is particularly important in gears, bearings, hydraulic pumps, machine slides, spindles and other precision components.

Heat Removal

Many machines generate significant heat through friction, compression and mechanical loading. Circulating, hydraulic, gear and specialized process oils help transfer heat away from operating components.

Corrosion Protection

Industrial equipment can be exposed to moisture, condensation, process chemicals and atmospheric contaminants. Appropriate additive systems help protect metal surfaces against rust and corrosion.

Contamination Management

Industrial lubricants are designed to manage water, air, oxidation products and other contaminants. Good demulsification, air-release, filtration compatibility and oxidation stability can be important depending on the equipment.

Load Carrying

Heavy industrial equipment may experience high contact pressures and shock loads. Gear oils and specialized heavy-duty lubricants use appropriate anti-wear and extreme-pressure technologies to maintain protective films under demanding conditions.

Long Service Life

Oxidation resistance, thermal stability and deposit control are essential for equipment expected to operate continuously. A stable lubricant can help extend drain intervals and reduce maintenance requirements when used under appropriate conditions.

Industrial Lubricant Classifications & Standards

Industrial lubricants are classified according to their application and performance characteristics. ISO 6743 provides a broad international classification system for industrial lubricants, while individual standards define requirements for specific lubricant families.

Hydraulic Oils

Hydraulic fluids are commonly classified under **ISO 11158** and ISO 6743-4. Current ISO 11158:2023 covers mineral-oil hydraulic fluid categories including HL, HM and HV. DIN 51524 further defines hydraulic-fluid categories, including HLP and HVLP.

Typical applications include hydraulic presses, injection-moulding machines, mobile equipment, machine tools, industrial power packs and hydraulic pumps.

Industrial Gear Oils

Industrial gear lubricants are classified under the ISO 6743-6 family and ISO 12925 series. ISO 12925-1:2024 covers lubricants for enclosed gear systems and includes categories such as CKC and CKD. DIN 51517-3 defines CLP lubricating oils for applications requiring enhanced wear protection under mixed-friction and high-load conditions.

Compressor Oils

Compressor lubricants cover reciprocating, rotary, vane, screw and other compressor systems. ISO 6743-3 provides the classification framework, while ISO 6521-1 specifies requirements for certain reciprocating and drip-feed rotary air-compressor lubricants.

Refrigeration Oils

Refrigeration compressor lubricants must be selected according to compressor design and refrigerant compatibility. ISO 6743-3 and DIN 51503 provide important classification references. The oil must maintain appropriate viscosity and chemical stability while remaining compatible with the refrigerant and operating temperature range.

Metalworking Fluids

Cutting and metalworking fluids are classified under the ISO 6743-7 family. These products provide lubrication, cooling, chip removal and corrosion protection during machining operations.

Transformer Oils

Transformer oils are electrical insulating liquids rather than conventional lubricants. Their primary functions are **electrical insulation and heat transfer**. IEC 60296 and ASTM D3487 are important reference standards, with properties including dielectric breakdown voltage, viscosity, flash point, water content, acidity, oxidation stability and corrosive sulfur being critical.

ISO Viscosity Grade

The **ISO VG system** provides a standardized method of classifying industrial lubricants according to their kinematic viscosity at 40°C.

For example:

- ISO VG 32 $\approx$ 32 cSt at 40°C
- ISO VG 46 $\approx$ 46 cSt at 40°C
- ISO VG 68 $\approx$ 68 cSt at 40°C
- ISO VG 100 $\approx$ 100 cSt at 40°C
- ISO VG 220 $\approx$ 220 cSt at 40°C
- ISO VG 460 $\approx$ 460 cSt at 40°C

Selecting the Correct Industrial Lubricant

Lubricant selection should consider:

- Equipment manufacturer's recommendation
- ISO viscosity grade
- Operating temperature
- Load and speed
- Lubrication method
- Water and contamination exposure
- Required anti-wear or extreme-pressure performance
- Seal and material compatibility
- Filtration requirements
- Food-contact or environmental requirements where applicable
- Required industry/OEM approval

The lubricant should always be selected according to the equipment manufacturer's requirements rather than viscosity alone.

ENERGO ORNA SERIES

HVI Hydraulic Oil

PRODUCT DESCRIPTION

Energo Orna Series is a high-viscosity-index hydraulic oil designed for hydraulic systems operating over a wide range of temperatures. It provides lubrication and wear protection while maintaining comparatively stable viscosity as operating temperature changes.

APPLICATIONS

- Industrial hydraulic systems, press & power packs
- Injection-moulding equipment, Machine tools
- Mobile and stationary hydraulic equipment

KEY BENEFITS

- High viscosity-index characteristics
- Good anti-wear protection
- Good oxidation stability
- Rust and corrosion protection

STANDARD / PERFORMANCE LEVEL

HLP-HVI — portfolio designation.

For formal standards claims, HVI hydraulic oils should be validated against the applicable **HV/HVLP category under ISO 11158 / DIN 51524-3.**

TYPICAL CHARACTERISTICS

Property	VG 32	VG 46	VG 68	VG 100	VG 150	VG 220	VG 320	VG 460
Density @ 15°C, g/cm ³	0.88	0.89	0.89	0.90	0.90	0.90	0.90	0.91
Viscosity @ 40°C, cSt	32	46	68	100	150	220	320	460
Viscosity @ 100°C, cSt	6.0	7.0	9.0	11.5	15.5	19.5	24.5	31
Viscosity Index	120	122	120	120	115	115	105	100
Flash Point, °C	230	230	230	230	235	240	245	250
Pour Point, °C	-30	-27	-24	-21	-18	-15	-12	-9

*Typical/indicative values. Actual values may vary with formulation and manufacturing tolerances.

ENERGO ORNA AW SERIES

Anti-Wear Hydraulic Oil – HLP

PRODUCT DESCRIPTION

Energo Orna AW Series is an anti-wear hydraulic oil designed for industrial hydraulic systems requiring reliable wear protection, oxidation stability and corrosion protection.

Available grades are ISO VG 32, 46, 68, 100, 150, 220, 320 and 460.

APPLICATIONS

- Hydraulic presses
- Industrial hydraulic power units
- Machine tools
- Injection-moulding machines
- Hydraulic pumps and motors
- General industrial hydraulic systems

KEY BENEFITS

- Anti-wear protection
- Good oxidation resistance
- Rust and corrosion protection
- Good thermal stability
- Good air-release characteristics
- Helps protect hydraulic pumps and valves

TYPICAL CHARACTERISTICS

Property	VG 32	VG 46	VG 68	VG 100	VG 150	VG 220	VG 320	VG 460
Density @ 15°C, g/cm ³	0.87	0.876	0.882	0.884	0.887	0.89	0.90	0.91
Viscosity @ 40°C, cSt	32	46	68	100	150	220	320	460
Viscosity @ 100°C, cSt	5.3	6.6	8.3	11.0	14.9	~19	~25	~31
Viscosity Index	98	98	98	95	95	95	90	90
Flash Point, °C	220	220	230	240	250	250	250	260
Pour Point, °C	-24	-24	-18	-18	-18	-15	-12	-9

*Typical/indicative values. Actual values may vary with formulation and manufacturing tolerances.

ENERGO FLOW SERIES

Anti-Rust Circulating Oil – HL

PRODUCT DESCRIPTION

Energo Flow Series is a circulating lubricant designed for industrial systems where good oxidation stability, rust protection, water separation and continuous circulation are required.

APPLICATIONS

- Circulating lubrication systems & Bearings
- General industrial machinery
- Gear and bearing circulation systems
- Pumps and mechanical systems requiring R&O oil

KEY BENEFITS

- Rust and corrosion protection
- Good oxidation stability
- Good water separation
- Good air release
- Low deposit tendency

STANDARD

HL / ISO 11158 / ISO 6743-4, where applicable.

TYPICAL CHARACTERISTICS

Property	VG 32	VG 46	VG 68	VG 100	VG 150	VG 220	VG 320	VG 460
Density @ 15°C, g/cm ³	0.86	0.86	0.89	0.90	0.91	0.92	0.92	0.92
Viscosity @ 40°C, cSt	32	46	68	100	150	220	320	460
Viscosity @ 100°C, cSt	5.5	6.8	8.7	11.5	15	19.5	25	31
Viscosity Index	95	95	95	95	90	90	90	90
Flash Point, °C	225	225	225	235	240	245	250	255
Pour Point, °C	-24	-24	-18	-18	-18	-15	-12	-9

*Typical/indicative values. Actual values may vary with formulation and manufacturing tolerances.

ENERGO SPIN X

Spindle Oil – ISO VG 10

PRODUCT DESCRIPTION

Energo Spin X is a low-viscosity spindle lubricant designed for high-speed machine-tool spindles, precision bearings and other applications requiring a light, clean and free-flowing industrial oil.

APPLICATIONS

- High-speed spindle bearings
- Precision machine tools
- Grinding machines & Lathes
- Instrument lubrication
- Low-viscosity circulating applications

KEY BENEFITS

- Low viscosity for high-speed operation
- Good oxidation stability
- Rust and corrosion protection
- Low foaming
- Good water separation

STANDARD

ISO VG 10

TYPICAL CHARACTERISTICS

Property	Typical Value*
ISO VG	10
Appearance	Clear, bright liquid
Density @ 15°C, g/cm ³	~0.84–0.86
Viscosity @ 40°C, cSt	9.5–10.5
Viscosity @ 100°C, cSt	~2.3
Viscosity Index	~90–110
Flash Point, °C	~160–175
Pour Point, °C	–18 to –30
Copper Corrosion	1a/1b

*Typical/indicative values. Actual values may vary with formulation and manufacturing tolerances.

ENERGO COMPRESSOR SERIES

Compressor Lubricating Oil

PRODUCT DESCRIPTION

Energo Compressor Series is formulated for lubrication and protection of compressor components under continuous operating conditions. It is designed to provide oxidation stability, wear protection, rust protection and good control of deposits.

Available grades are ISO VG 32, 46, 68, 100, 150 and 220.

APPLICATIONS

- Reciprocating compressors
- Rotary compressors
- Air compressors
- Compressor crankcases
- Vane and screw compressors where formulation is suitable
- General compressor lubrication

KEY BENEFITS

- Good oxidation resistance
- Anti-wear protection
- Rust and corrosion protection
- Good air release

STANDARD / CLASSIFICATION

According to compressor type under ISO 6743-3 / ISO 6521

TYPICAL CHARACTERISTICS

Property	VG 32	VG 46	VG 68	VG 100	VG 150	VG 220
Density @ 15°C, g/cm ³	0.88	0.89	0.90	0.90	0.90	0.90
Viscosity @ 40°C, cSt	32	46	68	100	150	220
Viscosity @ 100°C, cSt	5.3	6.7	8.5	11.0	15	19
Viscosity Index	95	95	95	95	90	90
Flash Point, °C	225	230	230	240	245	250
Pour Point, °C	-24	-24	-18	-18	-15	-12

*Typical/indicative values. Actual values may vary with formulation and manufacturing tolerances.

ENERGO SLIDE X SERIES

Slideway / Way Lubricating Oil

PRODUCT DESCRIPTION

Energo Slide X is a specialized slideway lubricant designed to provide smooth, controlled movement of machine-tool slides and tables. It helps minimize stick-slip, protects precision surfaces and supports accurate machine operation.

Available in ISO VG 32, 46, 68 and 100.

APPLICATIONS

- Machine-tool slideways
- Tables and guideways
- CNC machines
- Lathes
- Milling machines
- Grinding machines
- Horizontal and vertical slideways

KEY BENEFITS

- Helps reduce stick-slip
- Good surface adhesion
- Anti-wear protection
- Rust and corrosion protection
- Good water separation
- Supports machine-tool precision

TYPICAL CHARACTERISTICS

Property	VG 32	VG 46	VG 68	VG 100
Appearance	Clear/amber	Clear/amber	Clear/amber	Clear/amber
Density @ 15°C, g/cm ³	0.88	0.88	0.88	0.88
Viscosity @ 40°C, cSt	32	46	68	100
Viscosity @ 100°C, cSt	~5.5	~6.8	~8.8	~11.5
Viscosity Index	95	95	90	90
Flash Point, °C	215	220	230	240
Pour Point, °C	-24	-21	-18	-15

*Typical/indicative values. Actual values may vary with formulation and manufacturing tolerances.

ENERGO VAC SERIES

Vacuum Pump Oil

PRODUCT DESCRIPTION

Energo Vac Series Xcel Vac Pure is a specialized vacuum-pump lubricant designed to provide lubrication, oxidation stability and low deposit formation in compatible vacuum-pump systems.

Available grades are ISO VG 32, 46, 68 and 100.

APPLICATIONS

- Rotary vane vacuum pumps
- Industrial vacuum pumps
- Vacuum equipment
- Compatible mechanical vacuum systems

KEY BENEFITS

- Good oxidation stability
- Low deposit tendency
- Good lubricity
- Good thermal stability
- Rust protection
- Suitable for continuous vacuum-pump operation

TYPICAL CHARACTERISTICS

Property	VG 32	VG 46	VG 68	VG 100
Appearance	Clear, bright	Clear, bright	Clear, bright	Clear, bright
Density @ 15°C, g/cm ³	0.88	0.88	0.89	0.89
Viscosity @ 40°C, cSt	32	46	68	100
Viscosity @ 100°C, cSt	5.3	6.7	8.5	11
Viscosity Index	95	95	90	90
Flash Point, °C	220	220	230	240
Pour Point, °C	-24	-24	-18	-18

*Typical/indicative values. Actual values may vary with formulation and manufacturing tolerances.

ENERGO THERM SERIES

Heat Transfer Oil

PRODUCT DESCRIPTION

Energo Therm Series is a high-quality heat-transfer fluid designed for indirect heating systems where efficient heat transfer and thermal stability are required.

Available in ISO VG 32, 46 and 68.

APPLICATIONS

- Closed-loop heat-transfer systems
- Industrial heating systems
- Process heating
- Food and chemical processing where formulation permits
- Heat exchangers
- Thermal-fluid circulation systems

KEY BENEFITS

- Good thermal stability
- Good oxidation resistance
- Efficient heat transfer
- Low deposit tendency
- Good pumpability
- Long service potential under suitable operating conditions

TYPICAL CHARACTERISTICS

Property	VG 32	VG 46	VG 68
Density @ 20°C, g/cm ³	0.87	0.88	0.89
Viscosity @ 40°C, cSt	32	46	68
Viscosity @ 100°C, cSt	5.3	6.5	8.5
Viscosity Index	>100	>100	>95
Flash Point, °C	210	215	220
Pour Point, °C	-18	-15	-12
Initial Boiling Point, °C	>280	>285	>290

*Typical/indicative values. Actual values may vary with formulation and manufacturing tolerances.

ENERGO ENERGEAR SERIES

Industrial Gear Oil

PRODUCT DESCRIPTION

Energo Energear Series is an Industrial Gear Oil is designed for lubrication of enclosed industrial gear systems operating under moderate to severe loads. It provides lubrication, anti-wear/extreme-pressure protection and resistance to oxidation and corrosion.

APPLICATIONS

- Industrial gearboxes
- Reduction, Helical, Spur & Bevel gears
- Heavy-duty enclosed gear systems
- Bearings where suitable

KEY BENEFITS

- Strong load-carrying capability
- Anti-wear protection
- Extreme-pressure performance where formulated
- Good oxidation stability
- Rust and corrosion protection
- Good thermal stability
- Supports long lubricant service life

STANDARD / CLASSIFICATION

- ISO 12925-1
- ISO 6743-6
- DIN 51517-3 CLP, where applicable

TYPICAL CHARACTERISTICS

Property	VG 32	VG 46	VG 68	VG 100	VG 150	VG 220	VG 320	VG 460	VG 680
Density @ 15°C, g/cm ³	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Viscosity @ 40°C, cSt	32	46	68	100	150	220	320	460	680
Viscosity @ 100°C, cSt	5.5	6.8	8.5	11	15	19.4	24.5	31	40
Viscosity Index	90	95	95	95	95	95	95	95	95
Flash Point, °C	225	225	225	225	225	225	235	235	240
Pour Point, °C	-24	-21	-21	-15	-12	-12	-12	-12	-9

*Typical/indicative values. Actual values may vary with formulation and manufacturing tolerances.

ENERGO REFCOM SERIES

Refrigeration Compressor Oil

PRODUCT DESCRIPTION

Energo Refcom Series is a refrigeration compressor lubricant designed to provide lubrication, thermal stability and chemical compatibility in suitable refrigeration systems.

Available in ISO VG 32, 46 and 68.

APPLICATIONS

- Refrigeration compressors
- Air-conditioning compressors
- Reciprocating compressors
- Screw compressors where applicable
- Compatible refrigerant systems

KEY BENEFITS

- Good low-temperature fluidity
- Good oxidation stability
- Good lubricity
- Good chemical stability
- Helps protect bearings, cylinders and seals
- Suitable for compatible refrigerant systems

TYPICAL CHARACTERISTICS

Property	VG 32	VG 46	VG 68
Appearance	Clear, bright	Clear, bright	Clear, bright
Density @ 15°C, g/cm ³	0.88	0.88	0.89
Viscosity @ 40°C, cSt	32	46	68
Viscosity @ 100°C, cSt	5.5	6.5	7.0
Viscosity Index	95	95	95
Flash Point, °C	230	245	255
Pour Point, °C	-30	-30	-30

*Typical/indicative values. Actual values may vary with formulation and manufacturing tolerances.

ENERGO KNIT SERIES

Washable Knitting / Textile Machine Oil

PRODUCT DESCRIPTION

Energo Knit Series is a washable textile-machine lubricant designed for high-speed knitting machinery where good lubrication, anti-wear protection and easy removal during textile washing processes are required.

Available in ISO VG 15, 22, 32, 46 and 68.

APPLICATIONS

- Circular knitting machines
- Needles and sinkers
- Cam boxes
- Automatic oiling systems
- Textile machinery
- Cotton, polyester and synthetic yarn processing

KEY BENEFITS

- Excellent washability
- Good lubricity
- Anti-wear protection
- Rust and corrosion protection
- Low staining tendency
- Good oxidation stability

TYPICAL CHARACTERISTICS

Property	VG 15	VG 22	VG 32	VG 46	VG 68
Appearance	Clear	Clear	Clear	Clear	Clear
Density @ 15°C, g/cm ³	0.87	0.87	0.88	0.88	0.88
Viscosity @ 40°C, cSt	15	22	32	46	68
Viscosity @ 100°C, cSt	3.5	4.5	5.5	6.8	8.5
Flash Point, °C	175	180	185	190	220
pH of 10% Emulsion	7–8	7–8	7–8	7–8	7–8
Washability	Excellent	Excellent	Excellent	Excellent	Excellent

*Typical/indicative values. Actual values may vary with formulation and manufacturing tolerances.

ENERGO WT LUBE

White Machine Oil – ISO VG 10

PRODUCT DESCRIPTION

Energo WT Lube is a highly refined, low-viscosity mineral oil intended for applications requiring a clean, light-colored and chemically stable lubricating fluid.

APPLICATIONS

- Precision machinery
- Textile machinery
- Light machine lubrication
- Instruments
- Plastics and rubber processing equipment where compatible
- Light-duty bearings and mechanisms

KEY BENEFITS

- Clear, water-white appearance
- Low viscosity
- Good oxidation stability
- Good chemical stability
- Low odor
- Good lubricity
- Suitable for clean applications

TYPICAL CHARACTERISTICS

Property	Typical Value*
ISO VG	10
Appearance	Clear, water-white
Density @ 15°C, g/cm ³	0.85
Viscosity @ 40°C, cSt	9–11
Viscosity @ 100°C, cSt	2.5–3.0
Viscosity Index	90–110
Flash Point, °C	180
Pour Point, °C	–30
Sulfur	Very low
Odor	Very low

*Typical/indicative values. Actual values may vary with formulation and manufacturing tolerances.

ENERGO SEW LUBE

Sewing Machine Oil

PRODUCT DESCRIPTION

Energo SEW Lube is a light, clean machine oil designed for sewing machines and precision textile mechanisms requiring low-viscosity lubrication.

APPLICATIONS

- Domestic sewing machines
- Industrial sewing machines
- Textile machinery
- Small precision mechanisms
- Light-duty bearings and moving components

KEY BENEFITS

- Low viscosity
- Good penetration
- Clean lubrication
- Helps reduce friction and wear
- Good oxidation stability
- Low residue tendency
- Suitable for precision mechanisms

TYPICAL CHARACTERISTICS

Property	Typical Value*
Appearance	Clear, bright liquid
Colour	Water-white to pale yellow
Viscosity @ 40°C, cSt	12
Viscosity @ 100°C, cSt	3.0
Density @ 15°C, g/cm ³	0.86
Viscosity Index	110
Flash Point, °C	175
Pour Point, °C	-30

*Typical/indicative values. Actual values may vary with formulation and manufacturing tolerances.

ENERGO ENERCUT S

Soluble Cutting Oil

PRODUCT DESCRIPTION

Energo Enercut S is a water-mixable metalworking fluid designed to provide cooling, lubrication and corrosion protection during machining operations.

When correctly diluted with water, it forms a stable working emulsion suitable for a broad range of machining applications.

APPLICATIONS

- Turning, Milling, Drilling
- Grinding
- Reaming
- Sawing
- General machining of ferrous and non-ferrous metals

KEY BENEFITS

- Effective cooling
- Good lubricity
- Rust and corrosion protection
- Stable emulsion formation
- Helps improve tool life
- Supports improved surface finish

TYPICAL CHARACTERISTICS

Property	Typical Value*
Appearance of Concentrate	Clear/amber liquid
Density @ 20°C, g/cm ³	0.88–0.93
Appearance of 5% Emulsion	Milky/translucent white
pH @ 5% Emulsion	9.0–9.5
Refractometer Factor	1.0
Corrosion Breakpoint	2–3% v/v
Typical General Machining Concentration	4–8%
Heavy Machining	8–12%
Emulsion Stability	Pass

*Typical/indicative values. Actual values may vary with formulation and manufacturing tolerances.

ENERGO ENERCUT N

Neat Cutting Oil

PRODUCT DESCRIPTION

Energo Enercut N is a non-water-miscible cutting oil designed to provide lubrication, cooling and extreme-pressure protection during demanding metalworking operations.

APPLICATIONS

- Turning, Milling, Drilling, Tapping
- Thread cutting
- Broaching
- Gear cutting
- Honing
- Heavy-duty machining

KEY BENEFITS

- High lubricity
- Good cooling characteristics
- Helps extend tool life
- Supports improved surface finish
- Good wear protection
- Suitable for demanding cutting operations

TYPICAL CHARACTERISTICS

Property	Typical Value*
Appearance	Clear to amber liquid
Density @ 15°C, g/cm ³	0.84–0.90
Viscosity @ 40°C, cSt	35
Viscosity @ 100°C, cSt	6
Viscosity Index	110
Flash Point, °C	220
Pour Point, °C	–27
Copper Corrosion	Formulation dependent

*Typical/indicative values. Actual values may vary with formulation and manufacturing tolerances.

ENERGO TRANSFO OIL

Electrical Insulating / Transformer Oil

PRODUCT DESCRIPTION

Energo Transfo Oil is a highly refined mineral insulating fluid designed primarily to provide electrical insulation and heat transfer in transformers and compatible electrical apparatus.

APPLICATIONS

- Power transformers, Switchgear, Regulator
- Distribution transformers, Reactors

KEY BENEFITS

- High dielectric strength when properly processed and maintained
- Good heat-transfer capability & Oxidation stability
- Low moisture content when supplied correctly
- Good low-temperature flow

STANDARDS

- IEC 60296
- ASTM D3487

TYPICAL CHARACTERISTICS

Property	Typical Value*
Nominal Portfolio Grade	ISO VG 10
Appearance	Clear, bright, free from suspended matter
Density @ 15°C, g/cm ³	0.87
Viscosity @ 40°C, cSt	10
Viscosity @ -30°C, cSt	1800
Flash Point, °C	170
Pour Point, °C	-35
Breakdown Voltage, Kv	80
Water Content, ppm	20
Acidity / Neutralization Number	<0.001
Interfacial Tension, mN/m	47.3

*Typical/indicative values. Actual values may vary with formulation and manufacturing tolerances.

ENERGO RPO-A

Rubber Process Oil – Aromatic Type

PRODUCT DESCRIPTION

Energo RPO-A is a rubber process oil intended for use as a processing aid, plasticizer and extender oil in rubber-compounding applications. Aromatic-type process oils are commonly selected where strong solvency and compatibility with certain rubber polymers and fillers are required.

APPLICATIONS

- Tyre manufacturing
- Rubber compounds
- Conveyor belts
- Hoses
- Seals and gaskets
- Rubber sheets
- Technical rubber products

KEY BENEFITS

- Good rubber compatibility
- Good processing characteristics
- Supports mixing and dispersion
- Provides plasticizing effect
- Helps control compound viscosity
- Good processability

TYPICAL CHARACTERISTICS

Property	Typical Value*
Appearance	Dark brown to dark liquid
Density @ 15°C, g/cm ³	0.99
Viscosity @ 40°C, cSt	583.08
Viscosity @ 100°C, cSt	22.95
Flash Point, °C	235
Aniline Point, °C	55
Pour Point, °C	+30
Viscosity-Gravity Constant	1.0
Sulfur Content, % weight	2

*Typical/indicative values. Actual values may vary with formulation and manufacturing tolerances.

ENERGO RPO-P

Rubber Process Oil – Paraffinic Type

PRODUCT DESCRIPTION

Energo RPO-P is a paraffinic rubber process oil designed to improve processing, mixing and handling characteristics of compatible rubber compounds.

Paraffinic process oils are generally selected where good colour stability, lower aromatic content and compatibility with suitable rubber polymers are desired.

APPLICATIONS

- Tyres
- Rubber hoses
- Conveyor belts
- Seals and gaskets
- Rubber footwear

KEY BENEFITS

- Good processing characteristics
- Good colour stability
- Low aromatic character
- Good thermal stability
- Suitable plasticizing properties
- Supports mixing and dispersion

TYPICAL CHARACTERISTICS

Property	Typical Value*
Appearance	Light yellow to amber liquid
Density @ 15°C, g/cm ³	0.92
Viscosity @ 40°C, cSt	130
Viscosity @ 100°C, cSt	25
Flash Point, °C	≥220
Aniline Point, °C	120
Pour Point, °C	-15
Viscosity-Gravity Constant	0.88
PCA Content	Low

*Typical/indicative values. Actual values may vary with formulation and manufacturing tolerances.

ENERGO SMO SERIES

Sugar Mill Oil

PRODUCT DESCRIPTION

Energo SMO Series is a heavy-duty, high-viscosity industrial lubricant designed for demanding sugar-mill applications, particularly heavily loaded mill-house bearings and large open gears requiring a highly adhesive lubricant film.

Available grades are **3200, 3800 and 4200**.

APPLICATIONS

- Sugar-mill machinery
- Mill-house bearings
- Large open gears
- Chains and sprockets
- Heavy-duty exposed gearing
- Slow-speed, heavily loaded machinery

KEY BENEFITS

- Very high viscosity
- Excellent load-carrying capability
- Strong adhesive film
- Helps resist lubricant throw-off
- Good wear protection
- Rust and corrosion protection
- Suitable for total-loss lubrication systems

TYPICAL CHARACTERISTICS

Property	3200	3800	4200
Appearance	Black viscous liquid	Black viscous liquid	Black viscous liquid
Density @ 15°C, g/cm ³	0.98	0.98	0.98
Kinematic Viscosity @ 100°C, cSt	85	110	155
Flash Point, °C	235	240	245
Pour Point, °C	+5	+5	+5
Phosphorus, wt%	0.02	0.02	0.02

*Typical/indicative values. Actual values may vary with formulation and manufacturing tolerances.

INDUSTRIAL GREASES

Reliable Lubrication for Bearings, Machinery & Heavy-Duty Equipment

Industrial greases are semi-solid lubricants formulated to remain at the lubrication point while releasing lubricating oil to moving surfaces. They are particularly valuable where liquid lubricants may drain, leak or be displaced from the contact zone.

Grease is typically composed of base oil, thickener and performance additives. The base oil provides lubrication, the thickener creates the semi-solid structure, and additives can provide additional protection against wear, corrosion, oxidation, water and extreme pressure.

Modern industrial machinery can operate continuously under:

- High mechanical loads
- Shock and vibration
- Elevated temperatures
- High rotational speeds
- Water and humidity
- Dust and contamination
- Corrosive industrial environments
- Long relubrication intervals

The correct grease helps maintain a protective lubricant film between contacting surfaces, reducing friction and wear while helping protect bearings, gears, bushes, pins and other mechanical components.



KEY PERFORMANCE FUNCTIONS

Wear Protection

Reduces metal-to-metal contact and protects surfaces under load.

Extreme-Pressure Protection

Helps protect components subjected to high loads and shock loading.

Water Resistance

Helps maintain lubrication in wet, humid and washdown environments.

Temperature Stability

Maintains useful lubrication across demanding temperature conditions.

Corrosion Protection

Helps protect metal surfaces from rust and corrosion.

Mechanical Stability

Helps the grease maintain its consistency during prolonged working.

GREASE TECHNOLOGY

WHAT MAKES AN INDUSTRIAL GREASE PERFORM?

1. BASE OIL

The base oil provides the primary lubricating film.

Its viscosity influences:

- Load carrying
- Film thickness
- Bearing speed
- Temperature behavior
- Pumpability
- Energy consumption

Base-oil viscosity and NLGI consistency are different properties. A grease can have the same NLGI grade while using very different base-oil viscosities.

2. THICKENER

The thickener creates the grease structure.

Lithium

A widely used multipurpose thickener providing a good balance of mechanical stability and temperature performance.

Calcium

Traditional calcium soap technology with good water resistance, generally suited to moderate-temperature applications. Published calcium greases commonly show NLGI 2 consistency and dropping points around 90–100°C.

Lithium Complex

Provides higher-temperature capability than conventional lithium soap greases and is widely used for EP and heavy-duty applications. A lithium-complex EP 2 typically reports a 260°C minimum dropping point and 315 kgf four-ball weld load.

Calcium Complex

Designed for high load, temperature and water-exposure applications. Calcium-complex technology is particularly attractive where water resistance and high-temperature stability are required.

Bentonite

An inorganic clay thickener used for non-melting/high-temperature grease applications. Bentone grease, for example, uses bentonite clay and reports >260°C dropping point, 460 cSt base-oil viscosity at 40°C and 250 kgf four-ball weld load.

Polyurea

A non-soap thickener widely used for electric-motor and high-temperature bearing applications. Published polyurea products demonstrate dropping points around 253–280°C and strong high-temperature bearing performance.

PTFE / PFPE

Specialty fluorinated technology for applications requiring exceptional chemical resistance, low evaporation and very high temperature capability. A published PFPE/PTFE NLGI 2 grease operates from approximately –65°C to +250°C.

NLGI GRADES & GREASE SELECTION

SELECT THE RIGHT CONSISTENCY

NLGI grade describes grease consistency, not its overall performance level.

NLGI Grade	Worked Penetration @ 25°C	General Character
000	445–475 dmm	Very soft / semi-fluid
00	400–430 dmm	Semi-fluid
0	355–385 dmm	Soft
1	310–340 dmm	Soft
2	265–295 dmm	Standard industrial grease
3	220–250 dmm	Firm grease

NLGI defines these ranges from ASTM D217 worked penetration.

CHOOSING GREASE BY APPLICATION

High Load

Choose an EP or high-load formulation.

High Temperature

Consider lithium-complex, calcium-complex, bentonite or polyurea technology depending on the equipment and operating conditions.

Water Exposure

Calcium and calcium-complex technologies can be advantageous where water resistance is critical.

Electric Motors

Polyurea greases are commonly used in electric-motor bearings.

Very High Temperature / Aggressive Chemicals

PFPE/PTFE technology may be appropriate where conventional hydrocarbon-based greases cannot provide the required resistance.

Slow, Heavy Bearings

Higher base-oil viscosity and EP performance may be beneficial.

High-Speed Bearings

Grease selection should consider base-oil viscosity, consistency, mechanical stability, bearing speed and heat generation.

IMPORTANT TO FOLLOW

Grease colour **must not be used as the basis for compatibility or product selection**. Always confirm thickener chemistry, base oil, additives and OEM requirements before changing products.

GREASE PERFORMANCE & TESTING

MEASURING INDUSTRIAL GREASE PERFORMANCE

Industrial grease cannot be evaluated from dropping point alone. A complete evaluation may include consistency, mechanical stability, water resistance, corrosion protection, wear, EP performance, oil separation and high-temperature life.

WORKED PENETRATION — ASTM D217

Measures grease consistency after standard mechanical working.

A higher penetration number means a softer grease.

DROPPING POINT — ASTM D2265

Indicates the temperature at which grease begins to lose its structural retention under the specified laboratory test. It should **not** be interpreted as the maximum continuous operating temperature.

FOUR-BALL EP — ASTM D2596

Used to evaluate extreme-pressure/load-carrying characteristics. NLGI's established grease specifications include four-ball weld and load-wear measurements.

FOUR-BALL WEAR — ASTM D2266

Evaluates the wear scar generated under defined test conditions.

WATER WASHOUT — ASTM D1264

Measures grease loss when exposed to water under specified conditions. NLGI HPM requirements, for example, include a maximum 10% water-washout loss at 79°C.

RUST PROTECTION

Tests such as ASTM D1743 and SKF Emcor methods evaluate the ability of grease to protect metal surfaces against corrosion.

OIL SEPARATION

Measures the tendency of base oil to separate from the grease structure.

HIGH-TEMPERATURE LIFE

ASTM D3336 and other bearing-life tests can be used to evaluate grease performance under elevated-temperature bearing operation. Published polyurea products, for example, report hundreds of hours of high-temperature bearing life under defined test conditions.

ENERGO XCEL INDUSTRIAL GREASE RANGE

Product	Technology	NLGI	Primary Positioning
Energ MP Grease – Lithium	Lithium	0–3	Multipurpose
Energ MP Grease – Calcium	Calcium	2–3	Water Resistant
Energ EP Grease – Lithium	Lithium EP	2–3	Extreme Pressure
Energ EPHT Grease - Lithium Complex	Lithium Complex	2–3	High Temp + EP
Energ EPHT Grease - Calcium Complex	Calcium Complex	2–3	High Temp + EP + Water Resistance
Energ ND Grease	Bentonite Clay	2–3	High Temperature / Non-Drop
Energ EM Grease	Polyurea	2	High Temp / Electric Motors
Energ HTAR Grease	PTFE / PFPE	2	Very High Temp / Chemical Resistance

ENERGO MP — LITHIUM

Lithium Multipurpose Industrial Grease

Type: Lithium multipurpose grease

NLGI: 0–3

Standard: General-purpose industrial grease

APPLICATIONS

Bearings • Bushes • Pins • Conveyors • Fans • Pumps • General industrial machinery

TYPICAL CHARACTERISTICS

Property	Typical Value
Thickener	Lithium
NLGI Grade	0–3
Worked Penetration	0: 355–385 / 1: 310–340 / 2: 265–295 / 3: 220–250 dmm
Base Oil	Mineral
Base Oil Viscosity @ 40°C	160 cSt
Dropping Point	>190°C
4-Ball Weld Load	250 kgf
4-Ball Wear	0.40 mm
Timken OK Load	40 lb
Copper Corrosion	1A target
Rust Protection	Pass

ENERGO MP GREASE — CALCIUM

Water-Resistant Multipurpose Grease

Type: Calcium soap

NLGI: 2–3

Standard: Water resistant

APPLICATIONS

Wet machinery • Chassis • Pins • Bushes • Agricultural equipment • General industrial equipment

TYPICAL CHARACTERISTICS

Property	Typical Value
Thickener	Calcium
NLGI	2–3
Worked Penetration	265–295 / 220–250 dmm
Base Oil Viscosity @ 40°C	120 cSt
Dropping Point	>100°C
Water Washout	≤5% target
Copper Corrosion	1a–1b target
Rust Protection	Pass
Operating Range	–10 to +80°C

ENERGO EP GREASE — LITHIUM

Extreme-Pressure Lithium Grease

Type: Lithium EP

NLGI: 2–3

Standard: EP

APPLICATIONS

Heavy bearings • Conveyors • Crushers • Industrial machinery • Shock-loaded equipment

TYPICAL CHARACTERISTICS

Property	Typical Value
Thickener	Lithium
NLGI	2–3
Worked Penetration	265–295 / 220–250 dmm
Base Oil Viscosity @ 40°C	160 cSt
Dropping Point	>190°C
4-Ball Weld Load	250 kgf
4-Ball Wear Scar	0.40 mm
Timken OK Load	40 lb
Copper Corrosion	1A
Rust Protection	Pass

ENERGO EPHT GREASE – LITHIUM COMPLEX

High-Temperature Extreme-Pressure Grease

Type: Lithium Complex

NLGI: 2–3

Standard: HT EP

APPLICATIONS

Steel mills • Heavy bearings • Conveyors • Pumps • Fans • High-temperature industrial machinery

TYPICAL CHARACTERISTICS

Property	Typical Value
Thickener	Lithium Complex
NLGI	2–3
Worked Penetration	265–295 / 220–250 dmm
Base Oil Viscosity @ 40°C	220 cSt
Dropping Point	≥250°C
4-Ball Weld Load	315 kgf
4-Ball Wear	≤0.50 mm
Water Washout	≤5–10%
Rust Protection	Pass
Copper Corrosion	1A–1B

ENERGO EPHT GREASE – CALCIUM COMPLEX

High-Temperature EP & Water-Resistant Grease

Type: Calcium Complex

NLGI: 2–3

Standard: HT EP / Water Resistant

APPLICATIONS

Steel • Mining • Cement • Paper • Heavy bearings • Wet industrial environments • High-load machinery

TYPICAL CHARACTERISTICS

Property	Typical Value
Thickener	Calcium Complex
NLGI	2–3
Worked Penetration	265–295 / 220–250 dmm
Base Oil Viscosity @ 40°C	460 cSt
Dropping Point	≥250°C
4-Ball Weld Load	600 kgf
4-Ball Wear	0.45 mm
Water Washout	≤5% target
Rust Protection	Pass
Copper Corrosion	1A–1B

ENERGO ND GREASE

High-Temperature Non-Drop Grease

Type: Bentonite clay

NLGI: 2–3

Standard: HT Non-Drop

APPLICATIONS

Kilns • Furnaces • Dryers • Hot conveyors • Steel mills • Cement plants • High-temperature bearings

TYPICAL CHARACTERISTICS

Property	Typical Value
Thickener	Bentonite Clay
NLGI	2–3
Worked Penetration	265–295 / 220–250 dmm
Base Oil Viscosity @ 40°C	460 cSt
Dropping Point	>500°C
4-Ball Weld Load	250 kgf
Timken OK Load	45 lb
Rust Protection	Pass
Water Resistance	Good
Practical Service	Application dependent

ENERGO EM GREASE

High-Temperature Electric Motor Grease

Type: Polyurea

NLGI: 2

Standard: HT Electric Motor

APPLICATIONS

Electric motors • Fan bearings • Pumps • High-temperature bearings • Factory-filled bearings

TYPICAL CHARACTERISTICS

Property	Typical Value
Thickener	Polyurea
NLGI	2
Worked Penetration	280–285 dmm
Base Oil Viscosity @ 40°C	115 cSt
Dropping Point	>280°C
4-Ball Weld	500 kgf
4-Ball Wear	0.48 mm
Oil Separation	≤1% target
Water Washout	2%
Rust Protection	Pass

ENERGO HTAR GREASE

Very High-Temperature & Chemical-Resistant Grease

Type: PFPE base oil / PTFE thickener

NLGI: 2

Standard: Very HT / Acid Resistance

APPLICATIONS

Chemical processing • Valves • Seals • Electrical equipment • Specialty bearings • Aggressive environments

TYPICAL CHARACTERISTICS

Property	Typical Value
Base Technology	PFPE
Thickener	PTFE
NLGI	2
Base Oil Viscosity @ 40°C	500 cSt
Temperature Range	-65 to +250°C*
Colour	White / off-white
Chemical Resistance	Excellent
Fuel/Solvent Resistance	Excellent
Evaporation Resistance	Excellent
Corrosion Protection	Good

GLOSSARY

Lubrication, Fluids & Grease Technology

A practical reference to commonly used lubrication terms, specifications, classifications and performance characteristics.

A

Additives

Chemical components blended into base oils to provide or enhance specific performance properties such as detergency, dispersancy, anti-wear protection, oxidation resistance, corrosion protection, friction modification and extreme-pressure performance.

Anti-Wear (AW)

A lubricant performance characteristic designed to reduce wear when the lubricating film becomes thin or components operate under boundary or mixed lubrication conditions.

API — American Petroleum Institute

An industry organization whose service classifications are used to describe performance requirements for automotive engine oils. Gasoline-engine categories use the “S” designation, while diesel-engine categories primarily use the “C” designation.

API CI-4 / CJ-4 / CK-4

Diesel-engine oil performance categories representing progressively developed performance requirements for applicable diesel engines. The catalogue includes CI-4 and CJ-4 products and discusses CK-4 as a newer diesel category.

API GL-4

A gear-oil performance classification commonly associated with manual transmissions and gear applications requiring moderate extreme-pressure performance and appropriate synchronizer compatibility.

API GL-5

A gear-oil performance classification intended for suitable heavily loaded gear applications requiring higher extreme-pressure protection.

API SP

A gasoline-engine oil service category addressing performance areas including LSPI protection, timing-chain wear, high-temperature deposits and sludge/varnish control.

API SQ

The latest gasoline-engine service category represented in the catalogue, introduced in 2025, with additional requirements covering areas such as LSPI, timing-chain wear, deposits, sludge and varnish control.

ATF — Automatic Transmission Fluid

A specialized fluid used in automatic transmissions to provide lubrication, hydraulic pressure transmission, heat removal and controlled friction for smooth shifting.

B**Base Oil**

The fundamental lubricating medium used in a finished lubricant. Base oils may be mineral, synthetic or combinations depending on formulation and application.

Brake Fluid

A hydraulic fluid used to transmit pressure from the brake pedal to the braking mechanism. Automotive brake fluids must maintain appropriate hydraulic and temperature performance and compatibility with brake-system materials.

Brookfield Viscosity

A low-temperature viscosity measurement commonly used for highly viscous fluids and certain transmission fluids. It is expressed in mPa·s under specified test conditions.

C**Calcium Grease**

A grease using calcium soap as its thickener. It is traditionally associated with good water resistance and moderate-temperature applications.

Calcium-Complex Grease

A grease technology designed to provide a combination of high-load performance, temperature stability and water resistance.

Catalytic Converter Cleaner

An automotive maintenance treatment designed to assist in controlling suitable combustion and exhaust-system deposits. It cannot repair physically damaged or severely blocked catalytic converters.

Cetane Booster

A diesel-fuel additive intended to improve the cetane quality of compatible diesel fuel, supporting ignition characteristics and combustion performance.

cSt — Centistoke

A unit of kinematic viscosity. It is commonly used in lubricant specifications, particularly at 40°C and 100°C.

CVT — Continuously Variable Transmission

A transmission system that operates using continuously variable ratios rather than conventional fixed gear ratios.

CVT Fluid

A specialized transmission fluid formulated to provide lubrication and carefully controlled friction for CVT belts, chains, pulleys and hydraulic components.

D

Detergents

Lubricant additives that help control deposits and maintain cleanliness of engine components.

Dispersants

Additives that help keep contaminants and combustion by-products suspended in the lubricant, reducing their tendency to form deposits.

DCT — Dual-Clutch Transmission

A transmission design using two clutches to control different gear sets and provide rapid gear changes.

DCT Fluid

A specialized fluid designed to provide lubrication, cooling and controlled friction in compatible dual-clutch transmission systems.

DOT 3 / DOT 4

Automotive brake-fluid classifications. The required grade depends on the vehicle manufacturer and braking-system design.

Dropping Point

The temperature at which grease begins to lose its structural retention under a specified laboratory test. It should **not** be interpreted as the grease's maximum continuous operating temperature.

E

EP — Extreme Pressure

A lubricant performance characteristic that helps protect surfaces subjected to high loads, shock loading and severe contact pressures.

Extreme-Pressure Additives

Additives used to improve load-carrying and surface-protection performance under severe operating conditions.

F**Flash Point**

The temperature at which a lubricant produces sufficient vapour to form an ignitable mixture under a specified test method. It is an important safety and handling property.

Four-Ball EP Test — ASTM D2596

A laboratory test used to evaluate extreme-pressure and load-carrying characteristics of lubricating grease.

Four-Ball Wear Test — ASTM D2266

A test used to evaluate the wear scar produced under defined test conditions.

Friction Modifier

An additive designed to influence friction characteristics between contacting surfaces. Friction control is particularly important in applications such as automatic, CVT and DCT transmissions.

G**Gasoline / Petrol Engine Oil**

Engine oil formulated for gasoline/petrol engines and selected according to the manufacturer's required SAE viscosity and API performance category.

Gear Oil

A lubricant designed for gears, bearings and associated components in transmissions, differentials, final drives and industrial gear systems.

Grease

A semi-solid lubricant generally composed of base oil, thickener and performance additives. It is useful where a liquid lubricant may drain, leak or be displaced from the lubrication point.

H**HLP**

A hydraulic-fluid designation commonly used under DIN 51524 for mineral-oil hydraulic fluids with anti-wear performance.

HVI — High Viscosity Index

A hydraulic-oil characteristic indicating comparatively stable viscosity behaviour as operating temperature changes. The catalogue includes Xcel Hydromax as an HVI hydraulic oil.

Hydraulic Fluid

A fluid used to transmit power through hydraulic systems while also lubricating and protecting pumps, valves and other components.

Hydraulic Oil

Industrial oil formulated for hydraulic systems such as presses, injection-moulding machines, hydraulic power units, machine tools and hydraulic pumps.

I**ISO 6743**

An international classification framework covering different families of industrial lubricants according to application and performance.

ISO 11158

A standard covering mineral-oil hydraulic-fluid categories including HL, HM and HV.

ISO 12925

A series of standards relating to lubricants for gear systems, including enclosed industrial gear applications.

ISO VG — ISO Viscosity Grade

A standardized industrial lubricant viscosity classification based on kinematic viscosity at 40°C. For example, ISO VG 46 corresponds approximately to 46 cSt at 40°C.

J**JASO**

Japanese Automotive Standards Organization classifications used for various automotive applications. Motorcycle oils may use JASO classifications such as MA, MA1, MA2 and MB.

K**Kinematic Viscosity**

A measurement of a fluid's resistance to flow under gravity, normally expressed in cSt. Automotive engine oils are commonly specified at 40°C and 100°C.

L

Lithium Grease

A widely used grease technology offering a balance of mechanical stability and temperature performance.

Lithium-Complex Grease

A grease technology offering higher-temperature capability than conventional lithium-soap grease and commonly used for EP and heavy-duty applications.

Lubrication

The process of introducing a lubricant between moving surfaces to reduce friction, wear and surface damage.

LSPI — Low-Speed Pre-Ignition

An abnormal combustion phenomenon that can occur in certain modern turbocharged, direct-injection gasoline engines operating at low speed and high load. Modern engine-oil categories such as API SP and SQ include requirements addressing LSPI-related protection.

M

Manual Gear Oil

Lubricant designed for manual transmissions, gearboxes, differentials and final drives where the specified gear-oil performance classification is required.

Metalworking Fluid

A fluid used during machining operations to provide lubrication, cooling, chip removal and corrosion protection.

Mineral Base Oil

Base oil derived from refined petroleum fractions and used as the lubricating medium in many conventional lubricant formulations.

Monograde Oil

An engine oil classified under a single SAE viscosity grade, such as SAE 40 or SAE 50.

N

NLGI — National Lubricating Grease Institute

An organization associated with grease consistency classifications and grease performance standards.

NLGI Grade

A classification describing the consistency or hardness of grease. It does **not** by itself define the overall performance of the grease.

NLGI 000

Very soft/semi-fluid grease consistency.

NLGI 00

Semi-fluid grease consistency.

NLGI 0 / 1

Soft grease consistencies.

NLGI 2

A commonly used standard industrial grease consistency.

NLGI 3

A firmer grease consistency.

Non-Drop Grease

Grease formulated to maintain its structure and remain at the lubrication point under elevated-temperature service where conventional grease may soften excessively.

O**Octane Booster**

A petrol/gasoline fuel additive designed to increase the octane quality of compatible gasoline.

Oil Separation

The tendency of base oil to separate from the grease structure. It is an important property when evaluating grease storage and operating behaviour.

Oxidation

A chemical reaction between lubricant components and oxygen, accelerated by heat and other operating conditions. Oxidation can contribute to oil thickening, sludge and deposits.

Oxidation Stability

The ability of a lubricant to resist degradation caused by exposure to oxygen and elevated temperatures.

P

PFPE — Perfluoropolyether

A specialty fluorinated base-oil technology used where exceptional chemical resistance, low evaporation and very high-temperature capability are required.

Pour Point

The lowest temperature at which an oil will continue to flow under a specified test method. It is an important low-temperature characteristic.

Pour-Point Depressant

An additive used to improve the low-temperature flow behaviour of certain lubricants.

Polyurea Grease

A non-soap grease technology commonly used for electric-motor bearings and high-temperature bearing applications.

PTFE — Polytetrafluoroethylene

A fluorinated material used in specialty grease formulations where chemical resistance and high-temperature performance are required.

R

Rust Protection

The ability of a lubricant or grease to protect metal surfaces against rust and corrosion under specified conditions.

Refrigeration Oil

A lubricant used in refrigeration compressors. Selection depends strongly on compressor design, refrigerant compatibility, viscosity and operating temperature.

RPO — Rubber Process Oil

A process oil used in rubber compounding as a processing aid, plasticizer or extender oil. The catalogue includes an aromatic-type rubber process oil.

S

SAE — Society of Automotive Engineers

An organization whose viscosity classification systems are widely used for automotive lubricants.

SAE 10W-40

A multigrade viscosity classification. “10W” relates to low-temperature viscosity behavior, while “40” identifies the high-temperature viscosity classification.

SAE 20W-50

A higher-viscosity multigrade classification commonly used where specified by the vehicle or equipment manufacturer.

SAE 5W-30

A multigrade engine-oil viscosity classification combining low-temperature flow characteristics represented by 5W with an SAE 30 high-temperature viscosity classification.

Shear Stability

The ability of a lubricant to resist viscosity loss caused by mechanical shearing forces during service.

Sludge

Accumulated lubricant degradation products, contaminants and combustion-related materials that can form deposits within an engine or lubrication system.

Soot

Carbonaceous material produced during combustion, particularly associated with diesel engines. Suitable diesel engine oils use detergent/dispersant chemistry to help manage soot and related contaminants.

T**TBN — Total Base Number**

A measure associated with the alkaline reserve of an engine oil. It is particularly relevant to oils exposed to acidic combustion by-products.

Thickener

The component that creates the semi-solid structure of lubricating grease. Common technologies include lithium, calcium, lithium complex, calcium complex, bentonite and polyurea.

Timken OK Load

A test measurement used to assess the load-carrying capability of lubricating grease or oil under specified test conditions.

Transformer Oil

An electrical insulating liquid used primarily for electrical insulation and heat transfer in transformers and compatible electrical equipment.

V

Varnish

A hard or semi-hard deposit that can form from lubricant oxidation and thermal degradation. Good detergent, dispersant and oxidation-control systems help control varnish formation.

Viscosity

A measure of a fluid's resistance to flow. Correct viscosity is essential for maintaining an appropriate lubricating film and ensuring proper equipment operation.

Viscosity Index — VI

A measure describing how strongly an oil's viscosity changes with temperature. A higher VI generally indicates less viscosity change over a specified temperature range.

Viscosity Modifier / Viscosity-Index Improver

An additive used in multigrade lubricants to help control the change in viscosity with temperature.

W

Water Washout

A grease-performance test measuring grease loss when exposed to water under specified conditions.

Wet Clutch

A clutch operating in an oil environment. Motorcycle engine oils used with wet clutches require suitable friction characteristics, which is why the applicable JASO classification should be verified.



N3



Energo

LUBRICANTS

— REFERENCE HANDBOOK —

*Reliable Lubrication.
Superior Performance.*



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COMPILED AND PREPARED BY
Engr. Sajid Rasheed

Professional Engineer
Technical Advisor - Al Noor Petroleum (Pvt.) Limited
M. Sc Chemical Engineering (KTH Stockholm, Sweden)

*Thank you for taking the time to go through
the Energo Lubricants Reference Handbook.
We appreciate your trust and interest.*