

Aviation products list

Our nose-to-tail lubricant solutions help reduce fleet maintenance and operating costs

Key fact

Products should be stored between

0°C-40°C.

Introduction

Shelf life refers to the recommended time period during which ExxonMobil advises that a product is suitable for use (dispensing into equipment), provided the container has remained unopened, undamaged and was stored indoors. For certain products, short-duration excursions outside of this range may be acceptable.

Exxon™ and Mobil™ aviation lubricants

The shelf life of Exxon- and Mobil-branded aviation lubricants is listed on the container as the “use by” date. If an Exxon- or Mobil-branded aviation lubricant container does not have a “use by” date listed, check the manufacturing date or certification date in the Certificate of Analysis (COA) and add the recommended time period listed on this document to that date to determine the product’s shelf life.

ExxonMobil may extend the shelf life of a specific batch of product based on package style, package condition, known storage history or test results from an approved laboratory.

Aviation products list

Best practices

Once a container is opened, the product should be used as soon as possible to avoid contamination and degradation. Stated shelf life is no longer applicable once product is opened.

Organization-specific requirements

Some organizations, such as the US military, have their own periodic product retest requirements. These requirements may not coincide with the ExxonMobil shelf life recommendations.

Product	Package styles	MIL-SPEC/Approvals	Description	Recommended time period*
Mobil Jet™ Oil 387	<ul style="list-style-type: none"> • 24 x 1 quarts • 55-gallon drum 	<ul style="list-style-type: none"> • MIL-PRF-23699 HTS • SAE AS5780 HPC 	Synthetic aircraft turbine engine lubricating oil, HPC grade	10 years in quarts; 5 years in drums; 2 years in totes
Mobil Jet™ Oil 254	<ul style="list-style-type: none"> • 24 x 1 quarts • 55-gallon drum 	<ul style="list-style-type: none"> • MIL-PRF-23699F HTS • SAE AS5780 HPC 	Synthetic aircraft turbine engine lubricating oil, HTS/HPC grade	10 years in quarts; 5 years in pails and drums; 2 years in totes
Mobil Jet™ Oil II	<ul style="list-style-type: none"> • 24 x 1 quarts • 5-gallon pail • 55-gallon drum • 330-gallon totes 	<ul style="list-style-type: none"> • MIL-PRF-23699F STD • SAE AS5780 SPC 	Synthetic aircraft turbine engine lubricating oil, standard grade	10 years in quarts; 5 years in pails and drums; 2 years in totes
Mobil Avrex™ S Turbo 256	<ul style="list-style-type: none"> • 24 x 1 quarts • 55-gallon drum 	<ul style="list-style-type: none"> • MIL-PRF-7808, Grade 3 (QPL listed as RM 248A) 	Synthetic aviation gas turbine oil	10 years in quarts; 5 years in pails and drums
Mobil Avrex™ M Turbo 201/1010	<ul style="list-style-type: none"> • 5-gallon pail • 55-gallon drum 	<ul style="list-style-type: none"> • MIL-PRF-6081D, Grade 1010 	Mineral-based aviation gas turbine oil	10 years in quarts; 5 years in pails and drums
Exxon Aviation Oil Elite™ 20W-50	<ul style="list-style-type: none"> • 12 x 1 quarts • 55-gallon drum 	<ul style="list-style-type: none"> • SAE J1899 • MIL-L-22851D (obsolete) • Teledyne Continental Motors (MHS 24) • Textron Lycoming Spec. No. 301F 	Semisynthetic, ashless-dispersant multigrade piston engine oil	10 years in quarts; 5 years in pails and drums
Mobil AGL™ Synthetic Aviation Gear Lubricant	<ul style="list-style-type: none"> • 5-gallon pail • 55-gallon drum 	Consult with OEM or ExxonMobil representative	Synthetic helicopter gear oil	5 years in pails and drums
Mobil™ HyJet™ V	<ul style="list-style-type: none"> • 24 x 1 quarts • 6 x 1-gallon cans • 5-gallon pail • 55-gallon drum 	<ul style="list-style-type: none"> • Airbus NSA307110N Type V • ATR NSA307110N Type V • Boeing BMS 3-11P Type V, Grade A and Grade C • Boeing-Long Beach DMS 2014H Type 5 • Gulfstream 1159SCH302J Type V • SAE Aerospace Standard AS1241 Type V 	Type V fire-resistant phosphate ester-based hydraulic fluid	10 years in quarts/gallons; 5 years in pails/drums

* The recommended time period information below replaces all previous ExxonMobil recommendations and applies to unopened containers.

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Product	Package styles	MIL-SPEC/Approvals	Description	Recommended time period*
Mobil™ HyJet™ IV-A^{plus}	<ul style="list-style-type: none"> • 24 x 1 quarts • 6 x 1-gallon cans • 5-gallon pail • 55-gallon drum 	<ul style="list-style-type: none"> • Airbus NSA307110N • ATR NSA307110N • Boeing BMS 3-11P, Type IV, Class 1 and Type V, Grade B and Grade C • Boeing (Douglas Division) DMS 2014H • British Aerospace (Avro) BAC.M.333C • Bombardier/Canadair BAMS 564-003A • Bombardier/DeHavilland • Cessna • Embraer • Fokker • Gulfstream Aerospace 1159SCH302J • Lockheed C-34-1224C • SAE Aerospace Standard AS1241C 	Type IV fire-resistant phosphate ester-based hydraulic fluid	10 years in quarts/gallons; 5 years in pails/drums
Mobil Aero™ HF	<ul style="list-style-type: none"> • 24 x 1 quarts • 6 x 1-gallon cans • 5-gallon pail • 55-gallon drum 	<ul style="list-style-type: none"> • MIL-PRF-5606 • NATO Code H-515 	Mineral-based hydraulic oil	5 years in any container
Mobil Aero™ HFA	<ul style="list-style-type: none"> • 5-gallon pail • 55-gallon drum 	<ul style="list-style-type: none"> • MIL-H-5606A (obsolete) quality level 	Mineral-based hydraulic oil	5 years in any container
Mobilgrease™ 33	<ul style="list-style-type: none"> • 40 x 390 g (13.7 oz) cartridges • 4 x 2.0 kg/4.4 lb can • 16 kg/35.2 lb pail • 50 kg/110.2 lb keg 	<ul style="list-style-type: none"> • Airbus AIMS09-06-002 • Boeing BMS 3-33B Type 1 • MIL-PRF-23827C, Amendment 2, Type 1 • NATO G-354 • SAE AMS3052 	Synthetic multipurpose aircraft grease lithium complex thickener	10 years in any container [†]
Mobilgrease™ 28	<ul style="list-style-type: none"> • 40 x 390 g (13.7 oz) cartridges • 4 x 2.0 kg/4.4 lb can • 16 kg/35.2 lb pail • 50 kg/110.2 lb keg • 174 kg/383.6 lb drum 	<ul style="list-style-type: none"> • DOD-G-24508A Amendment 4 (quality level) • MIL-PRF-81322G • NATO G-395 	Synthetic multiple aircraft grease clay thickener	10 years in any container [†]
Mobil™ Aviation Grease SHC™ 100	<ul style="list-style-type: none"> • 4 x 2.0 kg/4.4 lb can • 16 kg/35.2 lb pail • 50 kg/110.2 lb keg 	Wheel builder approvals: <ul style="list-style-type: none"> • ABSC (Meggitt) • Dunlop (Meggitt) • Goodrich • Messier-Bugatti • Parker-Cleveland 	Synthetic aircraft wheel bearing grease lithium complex thickener	Up to 6 years in any container [†]

*The recommended time period information below replaces all previous ExxonMobil recommendations and applies to unopened containers.

[†]If a layer of oil is observed on top of the grease, mix it into the top one to two inches (2.5 cm to 5.0 cm) of grease prior to use. Horizontally stored grease cartridges may bleed minor amounts of oil. This may make the container cosmetically unpleasing, but the grease remains suitable for use.

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Product	Package styles	MIL-SPEC/Approvals	Description	Recommended time period*
Mobil COOLANOL™ 20, 25R	<ul style="list-style-type: none">• 1 USG cans• 5 USG pails• Carton (6x1 USG cans)	<ul style="list-style-type: none">• MIL-C-47220B, Type IV• Boeing (McDonnell Douglas)• MMS-652, Rev A• Grumman GM 6003A, Amendment-No 1• Type I• Hughes Aircraft HMS 20 1458 Rev E• Northrop MS-138, Rev A	Synthetic dielectric heat transfer fluids	5 years in any container

For more information

Please contact your ExxonMobil aviation sales representative.

* The recommended time period information below replaces all previous ExxonMobil recommendations and applies to unopened containers.

† If a layer of oil is observed on top of the grease, mix it into the top one to two inches (2.5 cm to 5.0 cm) of grease prior to use. Horizontally stored grease cartridges may bleed minor amounts of oil. This may make the container cosmetically unpleasing, but the grease remains suitable for use.

Brief product description book

17th Edition – USA

Energy lives here™



Brief product description book

17th Edition – USA

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Due to continual product research and development, the information contained herein is subject to change without notification.

INTRODUCTION

The primary intent of this publication is to provide a field reference for our core branded product offering of lubricating oils, greases and coolants. This guide provides specific product information in a format that is intended to assist in the selection of the right product for your application.

The BRIEF PRODUCT DESCRIPTION BOOK is organized into six sections— **Industrial, Commercial Vehicle, Passenger Vehicle, Marine, Aviation** and **Grease**. Within each of these six sections, products are divided into application groups. An outline of these groups and their respective products is provided at the beginning of each of the six sections. An alphabetical list of applications is provided up front and an alphabetical index of products is located at the end. An appendix also provides other reference information. **All products may NOT be available locally.**

Due to continual product research and development, the information contained herein is subject to change without notification. "Typical Properties" may vary and are typical of those obtained with normal product tolerance and do not constitute a specification. Variations that do not affect product performance are to be expected during normal manufacture and at different blending locations. For additional and/or more current information about our products, refer to the online product data sheets at mobil.com/pds. The Technical Support Center at 1-800-662-4525 or your local ExxonMobil representative can also provide assistance.

Many petroleum products pose potential human health, safety, and environmental hazards. We strongly urge you to read the following general precautions thoroughly and reference the appropriate Safety Data Sheets.

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INTRODUCTION1
HEALTH AND SAFETY PRECAUTIONS 3-5
SAFETY DATA SHEETS (SDS)6
SUSTAINABILITY IN MOTION7
APPLICATION INDEX OF PRODUCTS..... 8-9
ENERGY EFFICIENCY 10
MOBIL SHC™ GENERAL RECOMMENDATIONS.....11
BRIEF PRODUCT DESCRIPTIONS..... 12-95

APPENDICES96-104

- ANSI-AGMA Industrial Gear Lubricants 9005-D94 96
- Viscosity Conversion Table..... 97
- Degrees API Corresponding to Specific Gravities..... 97
- ISO Viscosity Classification System..... 98
- Grease Consistency Classification 98
- ISO 4406 – Oil Cleanliness by Particle Counting 99
- SAE Viscosity Grades For Engine Oils 100
- SAE Viscosity Grades For Gear Oils 100
- Temperature Conversion Table 101-102
- Mobil Serv Lubricant Analysis 103
- Manufacture Interpretation Key..... 104

ALPHABETICAL INDEX OF PRODUCTS 105-109

VISCOSITY CLASSIFICATION EQUIVALENTS111

QUESTIONS?

CALL THE EXXONMOBIL
TECHNICAL SUPPORT CENTER AT

1-800-662-4525

mobil.com/industrial | mobildelvac.com | mobil.com

HEALTH AND SAFETY PRECAUTIONS

The health and safety of people who handle and use our products are of vital interest and concern to us. Most ExxonMobil products are regarded as generally safe. As with all petroleum products, however, excessive and prolonged contact or improper handling may result in adverse effects. Below are general health and safety precautions for handling petroleum products. For more details and product-specific information, we urge you to obtain and read carefully the Material Safety Data Sheet (SDS) for each product handled to ensure that employees and users fully understand appropriate precautionary information relating to safe use. Safety Data Sheets are available on the web at www.sds.exxonmobil.com, by calling Fax-on-Demand at 1-713-613-3661, or by contacting your local representative.

ExxonMobil 24-Hour Emergency Line (Call Collect): 1-609-737-4411 in the U.S.

FIRE HAZARDS

Many petroleum products are highly volatile and flammable and must be handled with extreme caution to prevent fire or explosion. These include a few extra light viscosity lubricants and many solvents. The federal Occupational Safety and Health Administration (OSHA) has classified products with flash points below 37.8°C (100°F) as “flammable,” and products with flash points at or above 37.8°C and below 93.3°C (200°F) “combustible.” Products with flash points above 93.3°C (200°F), when used for their intended purposes, are not classified as fire hazards in accordance with OSHA (29 CFR 1910.1200).

Petroleum products should not be stored or handled near sources of ignition, such as heat, sparks, open flame, sources of static electricity, or near strong oxidants such as chlorine (including swimming pool chemicals) and concentrated oxygen.

WARNING: “Empty” containers retain residue (liquid and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition which may cause them to explode. Do not attempt to clean since residue is difficult to remove, and even a trace of remaining material constitutes an explosive hazard. “Empty” drums should be completely drained, properly bunged, and promptly returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

Health studies have shown that many petroleum hydrocarbons pose potential human health risks that may vary from person to person. As a precaution, exposure to liquids, vapors, and mists of petroleum products should be minimized.

Inhalation—Health specialists have established maximum concentration levels for hydrocarbon vapors in air to which nearly all workers may be safely exposed. Where applicable, the levels established for ExxonMobil products are indicated in Safety Data Sheets. Prolonged breathing of hydrocarbon vapor concentrations in excess of prescribed limits may result in light-headedness, dizziness, and nausea. Inhalation of higher vapor concentrations may produce dizziness, headache, respiratory tract irritation, and unconsciousness.

If a person is overcome by vapor, remove the individual from exposure at once and call a physician. If breathing is irregular or has stopped, start resuscitation and administer oxygen, if available. To avoid inhalation of excessive concentrations of hydrocarbons, store and handle highly volatile petroleum products such as solvents and solvent-cutback products only in open, well-ventilated areas. In special cases of indoor handling, e.g., laboratories, products always should be handled under vented hoods powered with explosion-proof motors.

Under certain circumstances, sulfur compounds in hot asphalt may form the toxic gas hydrogen sulfide (H_2S). Prolonged breathing of 50 to 100 ppm of H_2S will produce eye and respiratory tract irritation, headache, nervousness, and nausea. At higher concentrations of H_2S (700 to 1000 ppm) only a few breaths of the gas may lead to unconsciousness and could be fatal. To avoid breathing excessive concentrations of H_2S , personnel should stand upwind of tank and bulk transport compartments containing asphalt, keep their faces at least two feet from compartment openings, and avoid breathing vapors when opening hatches and dome covers. Use respiratory equipment where necessary.

Ingestion—As a general precaution, if petroleum products are ingested, keep the person calm. DO NOT induce vomiting. Call a physician immediately, identifying the product and approximate amount swallowed. While petroleum products are generally not highly toxic, solvents and light oils with viscosities below 20.5 centistokes (100 SUS) at 37.8°C (100°F) pose a distinct hazard of being aspirated into the lungs and causing chemical pneumonitis. This is a delayed effect, which may not occur for days. Because of the risk of accidental swallowing, petroleum products should never be siphoned by mouth.

Skin Contact—Prolonged or repeated contact of petroleum oils, greases, or solvents with the skin can cause skin irritation and dermatitis. In case of skin contact, wash skin thoroughly with soap and warm water. A waterless hand cleaner and a soft skin brush can be used to help remove oils and greases. For certain products, dry-wiping is advised before using waterless hand cleaner. Refer to the product SDS for specific instructions and precautions. Promptly remove petroleum-soaked clothing and launder before re-use. If a petroleum product contacts the eyes, flush the eyes with fresh water until the irritation subsides; if irritation persists, call a physician. If prolonged contact with petroleum products is unavoidable, wear chemical-resistant gloves, apron, splash goggles, and other protective clothing.

HEALTH AND SAFETY PRECAUTIONS

CONTINUED

High-pressure injection of grease through the skin (a grease gun injury) can cause serious delayed damage to soft tissues. Hydraulic oil under high pressure can cause similar injury. Regardless of the size or appearance of the wound, a physician should be contacted immediately, as treatment may require surgical intervention.

Chronic Health Effects—Although not the case with many highly or well refined petroleum oils, studies with laboratory animals have shown that prolonged exposure to certain petroleum products can cause cancer and other chronic health effects. Some petroleum oils and distillates have caused skin cancer in mice following skin painting tests over the animals' lifetime. In similar tests, used motor oil also has caused skin cancer. Carefully check the product SDS for such warning information. Inhalation of the vapors of most non-aromatic solvents has been shown to cause kidney damage in male rats. The normal hexane (n-hexane) component of hexane solvent is known to cause a form of motor nerve damage called peripheral polyneuropathy in humans.

ADDITIONAL HEALTH AND SAFETY RECOMMENDATIONS

You can protect yourself from petroleum-related hazards by exercising care and common sense in the handling of petroleum products. Appropriate engineering controls, work practices, and personal protection should be used to minimize skin contact and to keep exposure by inhalation as far below the recommended occupational exposure limit as is reasonably practical. Additional important health and safety information on any ExxonMobil product is provided in the Material Safety Data Sheet, available on the web www.sds.exxonmobil.com, by calling Fax-on-Demand at 1-713-613-3661, or by contacting your local ExxonMobil representative.

Why Is a Material Safety Data Sheet Important to You?

Many petroleum products carry inherent health, environmental, and safety hazards. Careful attention to the precautions and emergency procedures outlined in the appropriate Material Safety Data Sheet (SDS) can protect you and your co-workers from these risks.

What Is a SDS?

A SDS is a publication designed to provide the user of an ExxonMobil petroleum product with detailed, comprehensive, and up-to-date health and safety information relating to that product. There is an individual SDS for each ExxonMobil product. The SDS information is based on requirements of Occupational Safety and Health Administration (OSHA) Regulation 29 CFR 1910.1200, and the data presented are consistent with OSHA guidelines for informational content. These data are derived from various sources, including testing laboratories, independent research organizations, and raw material suppliers.

What Kind of Information Does a SDS Provide?

A SDS typically contains the following types of information:

- Physical data on the product (e.g., boiling range, vapor pressure)
- The nature and degree of health, environmental, and safety hazards associated with the product
- Precautionary guidelines for proper and safe handling of the product in order to avoid fire, explosion, and acute and chronic health hazards
- Emergency procedures in the event of fire, spill, or excessive exposure to the product by skin contact, ingestion, or inhalation

How to Obtain a SDS

- We urge every user of products to obtain the appropriate SDS. To obtain a sheet on any ExxonMobil product:
- Visit us on the web at www.sds.exxonmobil.com
- Call Fax-on-Demand at 1-713-613-3661 for a copy faxed immediately
- Contact your ExxonMobil representative

ExxonMobil 24-Hour Emergency Line (Call Collect): 1-609-737-4411 in the U.S.



Advancing Productivity™

The three pillars of Advancing Productivity serve as part of our corporate commitment to sustainability. At ExxonMobil, “sustainability” means balancing economic growth, social development and environmental protection so that future generations are not compromised by actions taken today.

To put sustainability in motion, we take a holistic approach across our offer, communication and process, providing innovative lubricants and services that can create tangible value for you in the areas of safety, environmental care and productivity. Through Advancing Productivity, our goal is to deliver performance benefits in these three crucial areas of your business so that you can achieve your full vision of success.



Safety

Minimizing employee – equipment interaction

We offer products and services that can help you mitigate potential employee injury caused by direct contact with equipment. These products and services are designed to help:

- Provide long drain intervals and enhance equipment reliability, minimizing maintenance, repair and replacement
- Reduce the potential for leaks that arise from handling used oil and related products
- Increase employee safety awareness and knowledge of a lubricant’s effect on health and safety
- Address the risk of potential product misapplication



Environmental Care

Designed to help lighten environmental touch

Our commitment to minimizing environmental impact has led us to create technologically advanced products and innovative services with that goal in mind. We strive to help you achieve this goal through:

- Optimized oil drain intervals, which can help reduce used oil volume and product packaging, as well as service-related risks
- Long component life, to help reduce worn equipment disposal and maintenance-related waste
- Potential GHG emissions reduction and other energy-efficiency benefits



Productivity

Controlling costly downtime and delays

Enhancing the competitive potential of our customers is an important part of Advancing Productivity. We achieve this objective through lubrication solutions that can help provide:

- Long drain intervals, which can help improve equipment availability, reduce lubricant transaction frequency and minimize disposal costs
- Powerful equipment protection, which can maximize equipment availability, helping you control costs of equipment maintenance and replacement
- Inventory consolidation potential

INDUSTRIAL LUBRICANTS	PAGE
Circulating Oils	18-20
Cylinder Oils	21
Compressor Lubricants	22
Food Industry Lubricants	23-24
Gas Engine Oils	25-28
Gear Oils – Enclosed Gears	29-31
Open Gear Lubricants	32
Heat Transfer Fluids	33
Hydraulic Fluids	34-35
Hydraulic Fluids – Environmentally Aware	37-38
Hydraulic Fluids – Less Flammable	39
Hydraulic Fluids – Food Industry	39
Metalworking Fluids – Oil-Based	40
Metalworking Fluids – Water Soluble	41
Mist Oils	42
Other Industrial Oils	43
Paper Machine Oils	44
Pneumatic Tool Oils	45
Quench Oils	45
Refrigeration Oils	46-48
Rust Preventives	50
Spindle Oil	51
Transformer Oil	51
Turbine Oils	51-52
Way Oils	53
COMMERCIAL VEHICLE LUBRICANTS	PAGE
Heavy Duty Diesel Engine Oils	55-57
Heavy Duty Power Transmission Fluids	58-63
Tractor Hydraulic Fluids	63
Coolant/Antifreeze	64

APPLICATION INDEX OF PRODUCTS

PASSENGER VEHICLE LUBRICANTS	PAGE
Passenger Vehicle Engine Oils	65-69
Passenger Vehicle Driver Train Fluids	70
Motorcycle Oils	71
Passenger Vehicle Installer Greases	71

MARINE LUBRICANTS	PAGE
Crosshead Engine Oil	73
Trunk Piston Engine Oil	74-75
Thruster Gear Oil – Synthetic	76

AVIATION LUBRICANTS	PAGE
Gear Oil	79
Greases	79
Hydraulic Fluids	80
Jet Oils	81-82
Piston Oil	82

GREASES	PAGE
Commercial Vehicle Greases	86
Industrial – Clay Thickened	87
Industrial – Coupling Greases	87
Industrial – Electric Motor Greases	88
Industrial – Environmentally Aware Greases	89
Industrial – Food Industry Greases	89
Industrial – Multi-Purpose Greases	90-91
Industrial – Open Gear Lubricants	32
Industrial – Paper Machine Greases	92
Industrial – Semi-Fluid Greases	92
Industrial – Specialty Synthetic Greases	93
Industrial – Steel Mill Greases	94
Industrial – Wind Turbine Greases	94
Passenger Vehicle Greases	95



The energy efficiency design is a trademark of Exxon Mobil Corporation.

About the Energy Efficiency Seal

ExxonMobil Fuels & Lubricants (F&L) is committed to providing products and services that help deliver tangible performance and sustainability related benefits — as well as material economic advantages — to industry and consumers. As a result, ExxonMobil F&L offers its consumers and customers an extensive range of high-performance lubricants that can help increase equipment operating efficiency and engine fuel economy. At the same time, these lubricants can help contribute to reduced energy and resource use, lower emissions, and cost savings for industrial equipment.

The energy efficiency seal is the typographic representation for all Mobil™ Industrial Lubricants products that meet the rigorous criteria for outstanding energy efficiency. The criteria for the use of the Energy Efficiency Seal are determined on a case-by-case basis and are dependent on the product category and application. Statistically valid data must be available to substantiate the energy efficiency claim and demonstrate a statistically significant decrease in energy consumption or increase in efficiency when compared with commercially available products designed and intended for the same application.

Below are the Mobil-branded Industrial Lubricants products in which this technology is available:

Mobil DTE™ 10 Excel

*The energy efficiency design is a trademark of Exxon Mobil Corporation. Energy efficiency relates solely to the fluid performance when compared with ExxonMobil's standard hydraulic fluids. The technology used allows up to 6 percent increase in hydraulic pump efficiency compared with Mobil DTE 20 Series when tested in standard hydraulic applications. The energy efficiency claim for this product is based on test results on the use of the fluid conducted in accordance with applicable industry standards and protocols. Efficiency improvements will vary based on operating conditions and applications.

Mobil SHC Pegasus™

*The energy efficiency design is a trademark of Exxon Mobil Corporation. The energy efficiency of Mobil SHC Pegasus relates solely to the fluid performance when compared to ExxonMobil's standard SAE 40 natural gas engine oils. The technology used in Mobil SHC Pegasus demonstrated up to a 1.5 percent increase in fuel efficiency, as measured by fuel consumed in operation, compared to Mobil Pegasus 1005 and 805 series when tested in standard natural gas engine applications under controlled conditions. The energy efficiency claim for this product is based on test results on the use of the fluid conducted in accordance with applicable industry standards and protocols. Efficiency improvements will vary based on operating conditions and applications.

Mobil SHC™ Gear

*The energy efficiency design is a trademark of Exxon Mobil Corporation. Energy efficiency relates solely to the fluid performance when compared with conventional reference oils of the same viscosity grade in gear applications. The technology used allows up to 3.6 percent efficiency compared with the reference when tested in a worm gearbox under controlled conditions. Efficiency improvements will vary based on operating conditions and applications.

Mobil SHC™ 500

*The energy efficiency design is a trademark of Exxon Mobil Corporation. Energy efficiency relates solely to the fluid performance when compared with ExxonMobil's standard hydraulic fluids. The technology used allows up to 6 percent

increase in hydraulic pump efficiency compared with Mobil DTE 20 Series when tested in standard hydraulic applications. The energy efficiency claim for this product is based on test results on the use of the fluid conducted in accordance with applicable industry standards and protocols. Efficiency improvements will vary based on operating conditions and applications.

Mobil SHC™ 600

*The energy efficiency design is a trademark of Exxon Mobil Corporation. Energy efficiency relates solely to the fluid performance when compared to conventional (mineral) reference oils of the same viscosity grade in circulating and gear applications. The technology used allows up to 3.6 percent efficiency compared to the reference when tested in a worm gearbox under controlled conditions. Efficiency improvements will vary based on operating conditions and application.

Mobil SHC Cibus™

*The energy efficiency design is a trademark of Exxon Mobil Corporation. Energy efficiency relates solely to the fluid performance when compared with conventional reference oils of the same viscosity grade. Under controlled conditions the technology used allows efficiency gains up to 3.6% when tested in a worm gearbox and up to 3.5% compared to Mobil DTE™ 25 when tested in an Eaton 25VMQ hydraulic vane pump. Efficiency improvements will vary based on operating conditions and applications.

Mobil SHC™ Hydraulic EAL

*The energy efficiency design is a trademark of Exxon Mobil Corporation. Energy efficiency relates solely to the fluid performance when compared to ExxonMobil's standard hydraulic fluids. The technology used provides up to 3.6 % efficiency compared to Mobil DTE 25 when tested in a Eaton 25VMQ vane pump under controlled conditions in accordance with applicable industry standards and protocols. Efficiency improvements will vary based on operating conditions and application.

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Productivity That's Proven

What truly sets Mobil SHC™ synthetic lubricants apart from its competitors is its track record. It represents Productivity That's Proven – the underlying claim behind our brand. No other synthetic lubricant has the experience, the proof, and the reputation to match it. All of our communication materials reflect that concept.

The full – and unmatched – suite of products that carry the Mobil SHC name have been tried, tested and proven in almost every type of equipment, under almost every condition.

Mobil SHC General Recommendations:

Circulating	Mobil SHC 600™ Series (<i>bearings and gears</i>) Mobil SHC Cibus™ Series (<i>food/NSF H-1 applications</i>) Mobil Glygoyle™ Numbered Series
Compressors	Mobil Rarus SHC™ Rarus ISO Series (<i>rotary screw and vane</i>) Mobil SHC Cibus™ Series (<i>food/NSF H-1 applications</i>) Mobil Rarus™ 800 Series (<i>reciprocating</i>)
Food Industry	Mobil SHC Cibus™ Series Mobil SHC Polyrex™ Grease Series
Gas Engine	Mobil SHC Pegasus™ 30 Mobil SHC Pegasus™ 40 Mobil Pegasus™ 1
Gear	Mobil SHC™ Gear Series Mobil SHC Cibus™ Series (<i>food/NSF H-1 applications</i>) Mobilgear SHC™ XMP Series (<i>wind turbines</i>)
Hydraulics	Mobil SHC™ 500 Series Mobil SHC™ Hydraulic EAL Series Mobil SHC Cibus™ Series (<i>food/NSF H-1 applications</i>)
Paper Machine	Mobil SHC™ PM Series Mobilith SHC™ PM Grease Series
Turbine	Mobil SHC™ 800 Series
Grease	Mobilith SHC™ Series (<i>multi-purpose</i>) Mobil SHC Polyrex™ Series (<i>food industry, high temperature</i>) Mobil SHC™ PF 462 (<i>extreme high temperature</i>) Mobil SHC™ Grease 460 WT (<i>wind turbines</i>) Mobiltemp SHC™ 32 (<i>high-speed</i>) Mobil SHC™ Grease 100 EAL Series (<i>environmentally aware</i>) Mobilith SHC™ PM Series (<i>paper machine</i>)

INDUSTRIAL LUBRICANTS	PRODUCT	PAGE
CIRCULATING OILS	Mobil-Branded Industrial Lubricants Warranty.....	17
	Mobil SHC™ 600 Series	18
	Mobil Glygoyle™ Numbered Series	18
	Mobil Vacuoline™ 500 Series	18
	Mobil DTE™ Oil Named Series	19
	Mobil DTE™ Oil Double Letter Series	19
	Teresstic™ Series.....	19
	Mobil Vactra™ Oil Named Series	19
	Mobil Vacuoline™ 100 Series	20
	CYLINDER OILS	Mobil™ Cylinder Oils
Mobil DTE™ Oil 205		21
COMPRESSOR LUBRICANTS	Mobil Rarus™ 800 Series.....	22
	Mobil Rarus™ 427	22
FOOD INDUSTRY LUBRICANTS	Mobil™ Food and Beverage Industry Selector	23
	Mobil SHC Cibus™ Series	24
	Mobil SHC Cibus™ 32 HT	24
	Mobil DTE™ FM Series.....	24
	Mobil SHC Polyrex™ Series.....	89
	Mobilgrease™ FM Series	89
	Mobil Glygoyle™ ISO Series.....	31
	Mobil Gargoyle Arctic SHC™ 200 Series	46
Synturion™ 6.....	43	

INDUSTRIAL PRODUCT LISTING BY APPLICATION

CONTINUED

INDUSTRIAL LUBRICANTS	PRODUCT	PAGE
GAS ENGINE OILS		
	Gas Engine Oil Selector	25
	Mobil SHC Pegasus™ Series	26
	Mobil Pegasus™ 1	26
	Mobil Pegasus™ 1005	26
	Mobil Pegasus™ 805	26
	Mobil Pegasus™ 805 Ultra	26
	Mobil Pegasus™ 505 Series	26
	Mobil Pegasus™ 600 Series	27
	Mobil Pegasus™ 605 Ultra	27
	Mobil Pegasus™ 701 Series	27
	Mobil Pegasus™ 710	28
	Mobil Pegasus™ 801	28
	Mobil Pegasus™ 805 Super	28
	Mobil Pegasus™ Special CF	28
GEAR OILS – ENCLOSED GEARS		
	Mobil SHC™ 600 Series	29
	Mobilgear™ 600 XP Series	29
	Spartan™ EP Series	29
	Mobil SHC™ Gear Series (ISO VG 150-1000)	30
	Mobil SHC™ Gear 1500, 3200, 6800	30
GEAR OILS – ENCLOSED GEARS SPECIALTY		
	Mobilgear SHC™ XMP Series	31
	Mobil Glygoyle™ Series	31
	Mobil SHC™ Gear 320 WT	31
	Mobil SHC Cibus™ 32 HT	24
GEAR OILS – OPEN GEARS		
	Mobil SHC™ Gear 22M and 46M	32
	Mobilnac™ 325 NC and 375 NC	32
	Mobilnac™ Double Letter Series	32
HEAT TRANSFER FLUIDS		
	Mobil Dynagear™ Series	33
	Mobiltherm™ 43	33
	Mobiltherm™ 603	33
	Mobil SHC Cibus™ 32 HT	24

INDUSTRIAL LUBRICANTS	PRODUCT	PAGE
HYDRAULIC FLUIDS	Mobil SHC™ 500 Series.....	34
	Mobil DTE 10 Excel™ Series.....	34
	Mobil DTE™ 20 Series.....	34
	Univis™ N Series.....	34
	Univis™ HVI Series.....	35
	Nuto™ H Series.....	36
	Mobil Aero™ HF Series.....	80
Mobil SHC Cibus™ Series.....	24	
HYDRAULIC FLUIDS – ENVIRONMENTALLY AWARE	Mobil SHC™ Hydraulic EAL.....	38
	Mobil DTE 10 Excel™ Series.....	34
	Mobil EAL™ 224H.....	38
HYDRAULIC FLUIDS – LESS FLAMMABLE	Nyvac™ FR 200D.....	39
	Pyrogard™ 53.....	39
HYDRAULIC FLUIDS – FOOD INDUSTRY	Mobil SHC Cibus™ Series.....	24
	Mobil DTE™ FM Series.....	24
METALWORKING FLUIDS – OIL-BASED	Mobilmet™ 420 Series.....	40
	Mobilmet™ 447.....	40
	Mobilmet™ 760 Series.....	40
	Mobilgrind™ Series.....	40
METALWORKING FLUIDS – WATER SOLUBLE	Mobilcut™ 100.....	41
	Mobilcut™ 140.....	41
	Mobilcut™ 230, 250.....	41
	Mobilcut™ 320.....	41
	Mobilcut™ 350.....	41

INDUSTRIAL PRODUCT LISTING BY APPLICATION

CONTINUED

INDUSTRIAL LUBRICANTS	PRODUCT	PAGE
MIST OILS	Mobilgear™ MS Series.....	42
	Mobil DTE 10 Excel™ Series.....	34
OTHER INDUSTRIAL OILS	Mobil™ Sawguide Oils	43
	Socony™ Oven Conveyer Lubricant	43
	Mobil™ Synthetic Oven Lube 1090	43
	Synturion™ 6.....	43
	Mobil™ System Cleaner	43
PAPER MACHINE OILS	Mobil SHC™ PM Series.....	44
	Mobil DTE™ PM Series	44
	Mobil DTE™ PM Ashless Series.....	44
PNEUMATIC TOOL OILS	Mobil Almo™ 500 Series.....	45
QUENCH OILS	Thermrex™ Series	45
REFRIGERATION OILS	Refrigeration Oil Selector	46-48
	Mobil Gargoyle Arctic SHC™ 200 Series	46
	Gargoyle Arctic™ 155 & 300.....	46
	Mobil EAL Arctic™ Series	46
	Mobil Glygoyle™ 22	46
	Mobil Zerice™ S Oils	46
RUST PREVENTIVES	Mobilarma™ 200 Series.....	50
	Mobilarma™ 500 Series.....	50
	Mobilarma™ 700 Series.....	50
	Mobil Vaprotec™ Light.....	50

INDUSTRIAL LUBRICANTS	PRODUCT	PAGE
SPINDLE OILS	Mobil Velocite™ Oil Numbered Series	51
TRANSFORMER OIL	Univolt™ N 61 B	51
TURBINE OILS	Mobil SHC™ 800 Series	51
	Mobil DTE™ 932 GT	52
	Mobil DTE™ 732 M.....	52
	Mobil DTE™ 800 Series.....	52
	Mobil DTE™ 700 Series.....	52
WAY OILS	Mobil Vactra™ Oil Numbered Series	53
	Mobil Vacuoline™ 1400 Series	53

Mobil ServSM

Mobil Serv Product Selector

- User friendly tool that delivers targeted Mobil-branded lubricant recommendations based on specific industry, equipment and application conditions
- Backed by more than a century of ExxonMobil working closely with many of the world’s leading industrial equipment manufacturers, use the Find my Equipment function to get a specific lubrication recommendation
- Visit the mobil.com/industrial website to find out more

INDUSTRIAL LUBRICANTS

CIRCULATING OILS

Limited Warranty for Mobil-Branded Industrial Lubricant Products

What The Warranty Covers

ExxonMobil Oil Corporation (“ExxonMobil”) provides this limited warranty to the purchasers who use Mobil-branded industrial lubricants in their equipment, as established by the original equipment manufacturer (“OEM”) and industry requirements (for example, the standards set by the American Society for Testing and Materials or other standards). This limited warranty covers the lubricant and critical components lubricated by the lubricant. ExxonMobil warrants its lubricants to be free from defects and that the lubricant you purchased will protect any equipment lubricated by the lubricant, provided that:

- The lubricant is confirmed to be an unadulterated Mobil-branded industrial lubricant product.
- The equipment has been operated within the limits specified by the OEM.

What The Warranty Does Not Cover

This Limited Warranty excludes:

- Mobil-branded industrial lubricants use in mechanically deficient equipment as a result of abnormal operation; negligence, abuse, damage from casualty, shipment or accident; or equipment modification done without written authorization from the OEM.
- Situations where the OEM required lubricant standards do not match those stated by ExxonMobil without the written approval from ExxonMobil.
- Mobil-branded industrial lubricant products that have been used in conjunction with any other product or additive that has not been authorized for use by ExxonMobil.
- Failure of equipment due to a pre-existing condition that is unrelated to the use of the lubricant.
- Repair or replacement of equipment due to normal wear.

What We Will Do To Correct Problems

ExxonMobil will replace any lubricant that is defective. In addition, if there is equipment failure due to the lubricant you purchased, ExxonMobil will repair any equipment damage directly caused by a defect or malfunction of the lubricant,

provided that the lubricant was selected and maintained in accordance with specifications of the OEM or the written instructions of an ExxonMobil sales or lubrication engineer employee.

How You Can Get Service

To file a claim under this limited warranty, you must:

1. Upon discovery of the damage (but no later than one (1) year from the date the damage occurred), contact your ExxonMobil or local distributor representative. You may also call 1-800-MOBIL-25 (662-4525) and press Prompt 4 to inquire about your Sales Engineer’s contact information.
2. Allow an ExxonMobil representative to examine the equipment, including its operating and maintenance records to determine the extent of the damage and to confirm that the lubricant was the cause.
3. Allow an ExxonMobil representative to obtain representative new and used lubricant samples for laboratory analysis to assist in determining the cause of the equipment failure.

How State Law Relates To The Warranty

This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

The remedy provided herein will be your only recovery against ExxonMobil. You will not be able to recover incidental damages (for example, transportation costs to and from the ExxonMobil representative for inspection of the equipment, loss of use, towing charges, bus fare, car rentals or other incidental damages) or consequential damages (the cost of repairing or replacing other property which was damaged when the lubricant was defective). Some states do not allow the exclusion of or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

THIS LIMITED WARRANTY IS IN LIEU OF ALL OTHER REMEDIES AND LUBRICANT PRODUCT WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR USE OR OTHERWISE BUT DOES NOT APPLY TO IN-SERVICE WARRANTIES CONVEYED WITH SPECIFIC INDUSTRIAL LUBRICANT PRODUCTS.

Mobil SHC™ Mobil SHC™ 600 Series lubricants are superb performance synthetic gear and bearing oils designed to provide outstanding service in terms of equipment protection, oil life and problem-free operation helping to enable increased customer productivity. These scientifically engineered oils are formulated using the latest proprietary and patent pending Mobil SHC technology to provide outstanding and balanced performance in demanding applications at high and low temperatures, well beyond the capabilities of conventional oils. The upgraded Mobil SHC 600 products feature excellent low temperature properties, as well as improved air release performance in the lower viscosity grades. These products are resistant to mechanical shear, even in heavily loaded gear and high shear bearing applications, so that there is virtually no loss of viscosity. ENERGY EFFICIENCY information on page 10.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 5950	Flash Point, °F (°C), ASTM D 92	FZG scuffing test, DIN 51534 (mod), A/16.6/90, Fail Stage
		cSt at 40°C	cSt at 100°C				
Mobil SHC 624	32	32	6.3	148	-70.6 (-57)	456.8 (236)	11
Mobil SHC 625	46	46	8.5	161	-65.2 (-54)	437 (225)	12
Mobil SHC 626	68	68	11.6	165	-59.8 (-51)	437 (225)	12
Mobil SHC 627	100	100	15.3	162	-49 (-45)	455 (235)	12
Mobil SHC 629	150	150	21.1	166	-43.6 (-42)	428 (220)	13
Mobil SHC 630	220	220	28.5	169	-43.6 (-42)	428 (220)	13+
Mobil SHC 632	320	320	38.5	172	-43.6 (-42)	437 (225)	13+
Mobil SHC 634	460	460	50.7	174	-38.2 (-39)	442.4 (228)	13+
Mobil SHC 636	680	680	69.0	181	-38.2 (-39)	437(225)	13+
Mobil SHC 639	1000	1000	98.8	184	-27.4 (-33)	431.6 (222)	13+

Mobil SHC™ Mobil Glygoyle™ Numbered Series oils are polyalkylene glycol-based (PAG) high performance lubricants that provide outstanding lubrication in extreme-temperature gear, bearing and circulation system applications in conditions well beyond the capabilities of mineral oils. They are shear-stable and have outstanding resistance to thermal degradation, oxidation and the formation of sludge and deposits. They incorporate a proprietary additive package designed to enhance EP/anti-wear protection, corrosion and rust protection and foam resistance without detracting from the intrinsic attributes of the PAG base oils.

Product	Viscosity, ASTM D 445		Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Spec. Gravity at 20° C, ASTM D 1298
	cSt at 40°C	cSt at 100°C			
Mobil Glygoyle 22	177	25.1	-41.8 (-41)	444.2 (229)	1.007
Mobil Glygoyle 30	224	30.9	-41.8 (-41)	429.8 (221)	1.006

Mobil Vacuoline™ 500 Series family of products provides a versatile lubricant source for a wide range of industrial equipment. The Mobil Vacuoline 500 Series of lubricants are high performance heavy duty circulating oils designed for the demands of No-Twist Rod mills, however their all around performance makes them an excellent choice for circulation systems lubricating gears and bearings. Mobil Vacuoline 500 Series are designed to meet the critical requirements of the Siemens VAI Metals (Morgan Construction Heritage) high speed No-Twist Rod Mills, as well as the circulation oil requirements of Danieli rod mills.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Spec. Gravity, at 15.6° C kg/l, ASTM D 1298
		cSt at 40°C	cSt at 100°C				
Mobil Vacuoline 525	–	89	10.7	99	-11.2 (-24)	507.2 (264)	0.88
Mobil Vacuoline 528	150	146	14.4	96	-5.8 (-21)	521.6 (272)	0.89
Mobil Vacuoline 533	220	215	18.8	96	5 (-15)	543.2 (284)	0.89
Mobil Vacuoline 537	320	309	24.4	96	10.4 (-12)	550.4 (228)	0.89
Mobil Vacuoline 546	460	453	29.4	95	10.4 (-12)	546.8 (286)	0.90

INDUSTRIAL LUBRICANTS

CIRCULATING OILS

Mobil DTE™ Oil Named Series of lubricants are premium performance circulating lubricants designed for applications including steam and hydro turbine sets and other systems where long lubricant service life is required. Mobil DTE Oil Named Series lubricants are formulated from highly refined base stocks and an additive system which provide an extremely high level of chemical and thermal stability, rapid and separation from water and a high resistance to emulsification. They provide excellent protection against rust and corrosion, including resistance to salt water, and good antiwear properties. These grades have excellent air release properties which allow entrained air to separate, thus avoiding pump cavitation and erratic operation.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
		cSt at 40°C	cSt at 100°C			
Mobil DTE Oil Light	32	31.0	5.5	102	-0.4 (-18)	424.4 (218)
Mobil DTE Oil Medium	46	44.5	6.9	98	5 (-15)	429.8 (221)
Mobil DTE Oil Heavy Medium	68	65.1	8.7	95	5 (-15)	433.4 (223)
Mobil DTE Oil Heavy	100	95.1	10.9	92	5 (-15)	458.6 (237)

Mobil DTE™ Oil Double Letter Series of lubricants are high performance heavy duty circulating oils primarily intended for circulation systems for gears and bearings. They are formulated from high quality base stocks and a proprietary additive system to provide excellent protection against rust, oxidation and thermal degradation, and a high level of protection against wear, plus excellent resistance to high temperature corrosion of soft metals. They possess good demulsibility that permits water and other contaminants to separate readily from the oil in the system reservoir.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
		cSt at 40°C	cSt at 100°C			
Mobil DTE Oil Extra Heavy	150	146	14.4	96	-5.8 (-21)	521.6 (272)
Mobil DTE Oil BB	220	218	18.8	96	-0.4 (-18)	543.2 (284)
Mobil DTE Oil AA	320	325	24.4	96	10.4 (-12)	546.8 (286)
Mobil DTE Oil HH	460	436	29.4	95	5 (-15)	550.4 (288)

Teresstic™ is the brand name for a line of quality circulating oils. They are formulated with carefully selected base stocks and additives, including oxidation and rust inhibitors and anti-foam agents. Mobil Teresstic 77 is an intermediate grade between ISO viscosity grades 68 and 100.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97
		cSt at 40°C	cSt at 100°C		
Teresstic 32	32	32.0	5.3	96	-5.8 (-21)
Teresstic 46	46	46.0	6.6	95	10.4 (-12)
Teresstic 68	68	68.0	8.5	95	10.4 (-12)
Teresstic 77	—	77.0	9.3	95	10.4 (-12)
Teresstic 100	100	100	11.1	95	10.4 (-12)
Teresstic 150	150	150	14.5	95	10.4 (-12)
Teresstic 220	220	220	18.8	95	10.4 (-12)
Teresstic 320	320	320	24.0	95	10.4 (-12)
Teresstic 460	460	460	30.4	95	10.4 (-12)

Mobil Vactra™ Oil Named Series are general purpose lubricants intended for non-critical industrial applications such as in all-loss systems, or where contamination and leakage are unavoidable. In such service, they offer an economic advantage over premium quality lubricants for plain and rolling element bearings in both reservoir and all loss systems, in gear applications and in hydraulic systems that do not require high quality anti-wear products.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
		cSt at 40°C	cSt at 100°C			
Mobil Vactra Oil Light	32	32.0	5.0	97	-16.6 (-27)	413.6 (212)
Mobil Vactra Oil Medium	46	46.0	6.7	97	-11.2 (-24)	467.6 (242)
Mobil Vactra Oil Heavy-Medium	68	68.0	8.7	98	5 (-15)	510.8 (266)

Mobil Vacuoline™ 100 Series range is a series of high quality circulating system oils primarily intended for the lubrication of plain bearings in systems designed for full fluid lubrication – particularly those subjected to heavy water contamination, such as back-up roll bearings in metal rolling mills. Specifically, they meet the requirements for Siemens VAI Morgoil rolling mill bearings including the “super demulsibility” advanced lubricant specification. The Mobil Vacuoline 100 Series oils are formulated from high quality base stocks and additives to provide outstanding water separation ability, good resistance to thermal degradation and oxidation, and protection against rust and corrosion.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Spec. Gravity, at 15° C kg/l, ASTM D 4052
		cSt at 40°C	cSt at 100°C				
Mobil Vacuoline 128	150	150	14.8	96	15.8 (-9)	536 (280)	0.89
Mobil Vacuoline 133	220	220	18.8	95	21.2 (-6)	550.4 (288)	0.89
Mobil Vacuoline 137	320	320	23.9	95	15.8 (-9)	546.8 (286)	0.90
Mobil Vacuoline 146	460	460	30.1	95	21.2 (-6)	564.8 (296)	0.90
Mobil Vacuoline 148	680	680	36.7	91	21.2 (-6)	604.4 (318)	0.91

INDUSTRIAL LUBRICANTS

CYLINDER OILS

Mobil Cylinder™ Oils are high performance high viscosity oils designed for use in enclosed worm gears operating at moderate to high speeds and temperatures, and where heavy loads, slow speeds or high temperatures demand high viscosity oils. They are also intended for use in steam engines, natural gas compressors requiring a separate cylinder lubricant, and down-hole applications. They are formulated from high quality base stocks that are resistant to oxidation and thermal degradation, and the build-up of harmful deposits caused by the high operating temperatures of steam cylinders. They protect against rust and corrosion, provide good film strength and excellent lubricity and they are resistant to water washout.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, ° F (°C), ASTM D 97	Flash Point, ° F (°C), ASTM D 92
		cSt at 40°C	cSt at 100°C			
Mobil 600 W Cylinder Oil	--	375	27.0	95	15.8 (-9)	539.6 (282)
Mobil 600 W Super Cylinder Oil	460	460	30.5	95	21.2 (-6)	539.6 (282)
Mobil Extra Hecla Super Cylinder Oil	680	680	35.8	85	32 (0)	539.6 (282)
Mobil Extra Hecla Super Cylinder Oil Mineral	1000	1000	43.0	80	37.4 (3)	550.4 (288)

Mobil DTE™ Oil 205 is a lubricating oil formulated to provide excellent anti-wear and friction-reducing properties for compressor cylinder lubrication as well as protection against rust and corrosion. Mobil DTE Oil 205 is designed for wet-gas compression and exhibits excellent resistance to washing by water and other entrained liquids. It resists oxidation and provides effective lubrication at low feed rates, thereby extending operating periods between valve-cleaning intervals.

Product	Viscosity, ASTM D 445		Pour Point, ° F (°C)	Flash Point, ° F (°C), min	Spec. Gravity, calc.
	cSt at 40°C	cSt at 100°C			
Mobil DTE Oil 205	220	19.5	16 (-9)	540 (282)	0.90

Mobil SHC™ Mobil Rarus™ 800 Series is a line of high performance air compressor lubricants primarily intended for the lubrication of reciprocating air compressors. They are engineered to meet or exceed the stringent requirements of the major compressor manufacturers. They are formulated with synthetic ester base oils and a high technology additive system that provides exceptional equipment protection and reliability. Mobil Rarus 800 Series oils provide excellent wear protection and outstanding resistance to oxidation and thermal degradation. Their unique formulation provides the ability to help reduce maintenance costs through minimizing equipment problems and downstream deposits and carryover.

Should not be used when compressing air for breathing.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
		cSt at 40°C	cSt at 100°C			
Mobil Rarus 824	32	29.5	5.5	127	-65.2 (-54)	471.2 (244)
Mobil Rarus 827	100	107.5	10.12	66	-32.8 (-36)	518 (270)
Mobil Rarus 829	150	158	13.2	70	-40 (-40)	518 (270)

Mobil SHC™ Mobil Rarus™ 427 is an air compressor lubricant designed to meet the requirements of the major compressor manufacturers. It is formulated with high quality mineral base oils and an additive system designed to provide equipment protection and reliability. Mobil Rarus 427 provides good wear protection and air-oil separation, and limits valve deposits.

Should not be used when compressing air for breathing.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270	Flash Point, °F (°C), ASTM D 92
		cSt at 40°C	cSt at 100°C		
Mobil Rarus 427	100	104.6	11.6	100	507.2 (264)

Mobil SHC™ Mobil SHC Cibus™ Series 24

INDUSTRIAL LUBRICANTS

FOOD INDUSTRY LUBRICANTS

Food & Beverage Industry

The food and beverage processing industry faces unique challenges. Not only must you strive for maximum productivity, you must also guard against the possibility of food contamination, including contamination from lubricating oils and greases. This comprehensive suite of high-performance oils are NSF H1 registered, which is increasingly being requested by major food retailers and government agencies.

Product	DIN Performance Claim	NSF Registered Number	NSF H1	Approval		CFIA* Accepted	Comments
				Kosher	Halal		
Mobil SHC Cibus™ 32	51524-HLP	141500	●	●	●	●	Multi-purpose hydraulic and compressor oils for the optimum lubrication solution. Long life, excellent equipment protection to help maximize productivity. Long drain intervals.
Mobil SHC Cibus™ 46	51524-HLP 51506-VDL	141498	●	●	●	●	
Mobil SHC Cibus™ 68	51524-HLP 51506-VDL	141499	●	●	●	●	
Mobil SHC Cibus™ 100	51506-VDL 51517-CLP 51524-HLP	145255	●	●	●	●	Designed to help optimize maintenance costs and unleash productivity improvements in circulation and gear box applications. Long oil life. Potential energy savings.
Mobil SHC Cibus™ 150	51517-CLP	141502	●	●	●	●	
Mobil SHC Cibus™ 220	51517-CLP	141503	●	●	●	●	
Mobil SHC Cibus™ 320	51517-CLP	141505	●	●	●	●	
Mobil SHC Cibus™ 460	51517-CLP	141501	●	●	●	●	
Mobil SHC Cibus™ 32 HT		141504	●	●	●	●	Synthetic heat transfer oil. Outstanding thermal and oxidative stability for long service life.
Mobil Glygoyle™ Series (220, 320, 460)		Varies	●				Low traction synthetic worm gear oil. Potential energy savings. Easy low temperature start-up.
Mobil Glygoyle™ Arctic SHC Series		Varies	●				Long life, fully synthetic refrigeration oil for use with ammonia as refrigerant.
Mobilgrease™ FM Series (101, 222)	KP1K-20	Varies	●	●	●	●	Multi-purpose greases (NLGI 1, 2). Excellent resistance to water wash-off. Long re-lubrication intervals.
Mobil SHC Polyrex™ Series (005, 221, 222, 462)	Varies	Varies	●	●			High temperature grease designed for tough operating conditions (up to 170°C) and moist environments.

Other Food Industry Lubricants

- Mobil SHC Cibus™ 32 HT: synthetic heat transfer fluid
- Mobil DTE™ FM (32, 46, 68) - premium mineral oils
- Synturion™ 6: synthetic mechanical seal fluid
- Mobil Gargoyle Arctic SHC™ Series: synthetic refrigeration lubricants
- Mobil™ SM 16M - open gear lubricant

Mobil SHC™ Mobil SHC Cibus™ Series lubricants are superb performance synthetic, compressor, hydraulic, gear and bearing oils designed to provide outstanding equipment protection, long oil life and problem-free operation in the food and beverage processing and packaging industries. They are formulated from FDA and NSF registered hydrocarbon base fluids and additives. ENERGY EFFICIENCY information on page 10.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Spec. Gravity, @ 15° C, ASTM D 4052
		cSt at 40°C	cSt at 100°C				
Mobil SHC Cibus 32	32	30	5.8	140	<-65.2 (<-54)	487.4 (253)	0.829
Mobil SHC Cibus 46	46	43	7.7	148	-59.8 (-51)	496.4 (258)	0.833
Mobil SHC Cibus 68	68	72	11.4	151	-54.4 (-48)	512.6 (267)	0.838
Mobil SHC Cibus 100	100	102	14.6	148	-54.4 (-48)	523.4 (273)	0.839
Mobil SHC Cibus 150	150	162	20.7	150	-5.8 (-21)	438.8 (226)	0.843
Mobil SHC Cibus 220	220	222	24.5	139	-38.2 (-39)	525.2 (274)	0.843
Mobil SHC Cibus 320	320	311	32.7	147	-43.6 (-42)	543.2 (284)	0.854
Mobil SHC Cibus 460	460	458	43.6	148	-43.6 (-42)	561.2 (294)	0.856

Mobil SHC™ Mobil SHC Cibus™ 32 HT is a synthetic high performance heat transfer oil intended for use in closed, indirect heating installations where NSF H1 registered lubricants are required. It is formulated to resist thermal cracking and chemical oxidation which in turn can mean a longer service life and lower propensity for deposit and sludge formation.

Product	Kinematic Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C			
Mobil SHC Cibus 32 HT	30.4	5.91	135	-65.2 (-54)	453.2 (234)

Mobil DTE™ FM Series oils satisfy a wide range of multi-use equipment requirements for the food processing and packaging industry. These lubricants are qualified as NSF H1 type lubricants and also comply with Title 21 CFR 178.3570 by the Food and Drug Administration (USA) for lubricants with incidental food contact. The lubricants are tasteless, odorless, premium quality lubricants formulated with non-toxic NSF/FDA additives and base oils.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, ° F (°C), ASTM D 97	Flash Point, ° F (°C), ASTM D 92	Spec. Gravity, @ 15.6° C/15.6° C, ASTM D 4052
		cSt at 40°C	cSt at 100°C				
Mobil DTE FM 32	32	31.9	5.5	106	10.4 (-12)	413 (212)	0.862
Mobil DTE FM 46	46	45.5	6.8	105	15.8 (-9)	438.8 (226)	0.868
Mobil DTE FM 68	68	68.5	8.7	101	10.4 (-12)	442.4 (228)	0.873

Mobil SHC™ Mobil SHC Polyrex™ Series	89
Mobil Grease™ Mobilgrease™ FM Series	89
Mobil SHC™ Mobil Glygoyle™ ISO Series	31
Mobil SHC™ Mobil Gargoyle Arctic SHC™ Series	46
Mobil SHC™ Synturion™ 6	43

INDUSTRIAL LUBRICANTS

GAS ENGINE OILS

MOBIL PEGASUS™ NATURAL GAS ENGINE OIL RECOMMENDATIONS

ENGINE MANUFACTURER	FUEL	MODELS	RECOMMENDATION
Ajax (Cooper Cameron)	CG	2-Cycle	Mobil Pegasus Special CF
Caterpillar	CG	398/399	Mobil SHC Pegasus 30, Mobil Pegasus 1005, 805
	CG	3300, 3400, 3500, 3600, GCM	Mobil SHC Pegasus 30, Mobil Pegasus 1005, 805
	LFG	All	Mobil Pegasus 605
Cooper Bessemer	CG	2-Cycle	Mobil Pegasus 801
	CG	4-Cycle	Mobil Pegasus 505, 805, 1005
Dresser Rand - Ingersoll Rand	CG	Category I	Mobil Pegasus 801/30, 505/30
	CG	Category II	Mobil Pegasus 801/30, 505/30
	CG	Category III	Mobil Pegasus 505/30, 801/30
Clark	CG	2-Cycle	Mobil Pegasus 505/30, 505, 805
Enterprise	CG	All	Mobil Pegasus 505, 805
Fairbanks-Morse (MEP)	CG	2-Cycle	Mobil Pegasus 505/30, 505, 805
Nordberg (Hatch and Kirl)	CG	All	Mobil Pegasus 505
	LFG	All	Mobil Pegasus 610
Superior (Cooper Cameron)	CG	G, GT, GST, GTLA, GTLB	Mobil Pegasus 710
White (Cooper Cameron)	CG	1700, 2400	Mobil Pegasus 805
	LFG	G, GT, GST	Mobil Pegasus 610
	LFG	1700, 2400	Mobil Pegasus 605
Waukesha	CG	VHP - F2895, F3521, L5796, L7042, P9390 G, GSI, GL	Mobil Pegasus 805, 1005, 710
	CG	VHP - F3524, L5794, L7044 GSI - L5774, L5794 LT	Mobil Pegasus 1005, 805 Mobil Pegasus 1005, 805
		VSG - F11G, GSI, GSID	Mobil Pegasus 1005, 805
	CG	VGF - F18, H24, L36, P48 G, GL, GLD, GSID	Mobil Pegasus 1005, 805
	CG	AT 25/27, 8L, 12V, 16V, GL	Mobil Pegasus 1005, 805
	LFG	VHP, AT	Mobil Pegasus 605, 610
	BMG	VHP, AT	Mobil Pegasus 605
	DG	All	Mobil Pegasus 610
	Worthington (Dresser Rand)	CG	2-Cycle
CG		2-Cycle TC	Mobil Pegasus 801, 505
CG		4-Cycle	Mobil Pegasus 801, 505

NOTES:

1 - THE MOBIL PEGASUS™ 605 IS A PREFERRED ALTERNATIVE FOR CATERPILLAR LANDFILL GAS APPLICATIONS.

FUELS:

CG - CLEAN GAS - NATURAL GAS 90-95% METHANE WITH <10 PPM H₂S AND <5% LIQUID HYDROCARBON

LFG - LANDFILL GAS - 40-60% METHANE, 20-40% CO₂, 500-1500 ppm H₂S, 50-150 ppm CHLORINATED COMPOUNDS AND QUANTITIES OF SILICON COMPOUNDS

DG - DIGESTER GAS - SEWER GAS - 50-70% METHANE, 20-30% CO₂ CAN CONTAIN LARGE AMOUNTS OF CORROSIVE COMPOUNDS (H₂S)

BMG - BIO - MASS GAS - SEE DIGESTER GAS

* YOU SHOULD ALWAYS CHECK WITH THE MANUFACTURER FOR LUBRICANT RECOMMENDATIONS

Mobil SHC™ Mobil SHC Pegasus™ Series is a new category of advanced technology synthetic natural gas engine oil designed to provide today's high output, low-emission four-cycle gas engines with the highest levels of protection with the added potential benefit of fuel consumption reductions. Mobil SHC Pegasus is the latest addition to the technologically advanced line of Mobil Pegasus natural gas engine oils that offer high performance, long service life and improved productivity. ENERGY EFFICIENCY information on page 10.

Product	SAE Grade	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	TBN, mg KOH/g	Sulfated Ash, wt% ASTM D 874
		cSt at 40°C	cSt at 100°C					
Mobil SHC Pegasus 30	30	65	10.5	162	-59.8 (-51)	491 (255)	5	0.5
Mobil SHC Pegasus 40	40	82	13	150	-31 (-35)	458.6 (237)	5.6	0.56

Mobil SHC™ Mobil Pegasus™ 1 is a high performance synthetic gas engine oil designed to meet the highest performance requirements of some of the most demanding naturally aspirated and turbocharged stoichiometric and lean-burn gas engines. It is formulated from wax-free synthetic base oils and a balanced additive system to provide performance that is unattainable with conventional mineral oil-based gas engine oils. A potential benefit is improved low temperature pumpability while maintaining film strength at operating temperature.

Product	SAE Grade	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	TBN, mg KOH/g, ASTM D 2896	Sulfated Ash, wt% ASTM D 874
		cSt at 40°C	cSt at 100°C					
Mobil Pegasus 1	15W-40	93.8	13.0	137	-54.4 (-48)	460.4 (238)	6.5	0.5

Mobil Pegasus™ 1005 is the next generation of Mobil Pegasus high performance gas engine oil. Designed to provide today's high output, low-emission four-cycle gas engines with the highest levels of protection while maintaining outstanding performance in earlier model engines. Mobil Pegasus 1005 is the latest addition to the Mobil Pegasus pedigree of proven natural gas engine oils with a balanced, durable formulation.

Product	SAE Grade	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	TBN, mg KOH/g	Sulfated Ash, wt% ASTM D 874
		cSt at 40°C	cSt at 100°C					
Mobil Pegasus 1005	40	125	13.0	100	5 (-15)	476.6 (247)	5	0.5

Mobil Pegasus™ 805 is premium performance gas engine oil engineered to meet the rigorous demands of today's high output four-cycle engines designed to reduce emissions and improve fuel-efficiency. These gas engines generally operate under high load and high temperature conditions. Mobil Pegasus 805 is made from the highest quality base stocks and an advanced technology additive system that provides exceptional oxidation stability, nitration resistance and thermal stability. Its detergent and dispersant system controls the formation of carbon deposits, lacquer and sludge.

Product	SAE Grade	Viscosity, ASTM D 445		V.I. ASTM D 2270	TBN, mg KOH/g, ASTM D 2896	Spec. Gravity 15.6° C/15.6°C, ASTM D 4052	Sulfated Ash, wt% ASTM D 874
		cSt at 40°C	cSt at 100°C				
Mobil Pegasus 805	40	130	13.5	99	6.2	0.89	0.5

Mobil Pegasus™ 805 Ultra is a high performance gas engine oil engineered to meet the rigorous demands of today's high output four-cycle engines designed to reduce emissions and improve fuel-efficiency. It meets a wide range of OEM requirements making it a great choice where high-speed four-cycle engines from various OEMs are used. Mobil Pegasus 805 Ultra is designed to provide very good protection against piston scuffing, scoring and ring and liner wear. It also exhibits excellent resistance to foaming, good demulsibility and high level corrosion protection. It is formulated with low levels of zinc and phosphorus making it compatible with engines equipped with catalytic converters.

Product	SAE Grade	Viscosity, ASTM D 445		V.I. ASTM D 2270	Sulfated Ash, wt% ASTM D 874
		cSt at 40°C	cSt at 100°C		
Mobil Pegasus 805 Ultra	40	125	13	97	0.5

INDUSTRIAL LUBRICANTS

GAS ENGINE OILS

Mobil Pegasus™ 505 Series are natural gas engine oils formulated exclusively from specially selected base stocks of high stability. These lubricants provide the excellent performance and economy for a wide variety of engine types, service severity and fuel qualities.

Product	SAE Grade	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	TBN, mg KOH/g, ASTM D 2896	Sulfated Ash, wt% ASTM D 874
		cSt at 40°C	cSt at 100°C					
Mobil Pegasus 505	40	126	13.1	97	5 (-15)	460.4 (238)	2.7	0.5
Mobil Pegasus 505 SAE 30	30	85	10.2	97	5 (-15)	456.8 (236)	2.7	0.5

Mobil Pegasus™ 600 Series lubricants are high performance natural gas engine oils primarily intended for the lubrication of modern medium and high-speed four-cycle engines operating on fuel that contains corrosive materials such as hydrogen sulphide or halogens (compounds containing chlorine, fluorine, bromine, etc.). These engines are generally of the lean-burn design where increased manifold pressures prevent sufficient lubricant from reaching the valve guide areas resulting in low oil consumption which can lead to accelerated valve guide and valve recession. This effect also increases the potential for wear and acid attack of upper cylinder components from the acidic materials generated during combustion. Mobil Pegasus 600 oils are gas engine oils with exceptional reserve alkalinity designed to offset the negative effects of acidic materials on engine components at 0.5% ash for Mobil Pegasus 605 and 1.0% ash for Mobil Pegasus 610. The excellent corrosion protection properties help prevent corrosive wear in cylinders, valve areas and bearings which can result in long engine life and low maintenance costs. The oils also provide excellent anti-wear and anti-scuff performance which helps assure minimal piston scuffing, scoring and low cylinder liner and piston ring wear.

Product	SAE Grade	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	TBN, mg KOH/g, ASTM D 2896	Sulfated Ash, wt% ASTM D 874
		cSt at 40°C	cSt at 100°C					
Mobil Pegasus 605	40	120	13.2	104	5 (-15)	474.8 (246)	4.9	0.5
Mobil Pegasus 610	40	130	13.8	102	-0.4 (-18)	507.2 (264)	8.6	1.0

Mobil Pegasus™ 605 Ultra 40 is the latest generation of gas engine oil primarily intended for the lubrication of modern medium and high-speed four-cycle engines operating on landfill gas that contains contaminants such as hydrogen sulphide, halides or siloxane. Its formulation has been carefully balanced to provide extended oil drain intervals, control the formation of carbon and varnish deposits, with very good anti-wear and anti-scuff performance.

Product	SAE Grade	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	TBN, mg KOH/g	Sulfated Ash, wt% ASTM D 874
		cSt at 40°C	cSt at 100°C					
Mobil Pegasus 605 Ultra 40	40	137.5	15	110	-5.8 (-21)	514.4 (268)	5.3	0.6

Mobil Pegasus™ 701 Series are premium natural gas engine oils that provide the excellent performance and economy for a wide variety of engine types, service severity and fuel quality. Mobil Pegasus 701 and 701 SAE 30 are formulated with ashless dispersants, effective oxidation and corrosion inhibitors, and antiwear agents. They provide excellent dispersancy, and good high-temperature stability. The formulation approach is very effective for controlling carbon and ash deposits in gas engines. The ashless dispersants in Mobil Pegasus 701 and SAE 30 help prevent the formation of deposits that can cause detonation. Port carbon cleaning intervals in two-cycle, naturally aspirated and turbocharged gas engines may be extended by using Pegasus 701 Series oils.

Product	SAE Grade	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	TBN, mg KOH/g, ASTM D 2896	Sulfated Ash, wt% ASTM D 874
		cSt at 40°C	cSt at 100°C					
Mobil Pegasus 701	40	132	13.5	97	5 (-15)	480.2 (249)	2.2	< 0.1
Mobil Pegasus 701 SAE 30	30	85	10	97	-0.4 (-18)	460.4 (238)	1.7	< 0.1

Mobil Pegasus™ 710 is a premium performance gas engine oil primarily intended for the lubrication of modern high-speed four-cycle engines where oil consumption is very low. These engines are generally of the lean-burn design where increased manifold pressures prevent sufficient lubricant from getting into the valve guide areas. This oil is also recommended for the lubrication of gas compressors. It is formulated from high quality mineral base oils and an advanced medium ash additive system designed to provide excellent protection of engine and compressor components. It exhibits a high level of chemical stability and resistance to oxidation and nitration. Mobil Pegasus 710 offers outstanding resistance to valve train wear and protection against deposit formation. These performance advantages combined with its very effective detergency and dispersancy system control the formation of ash and carbon deposits that could result in poor engine performance and detonation.

Product	SAE Grade	Viscosity, ASTM D 445		V.I. ASTM D 2270	TBN, mg KOH/g, ASTM D 2896	Spec. Gravity 15.6° C/15.6°C, ASTM D 1298	Sulfated Ash, wt% ASTM D 874
		cSt at 40°C	cSt at 100°C				
Mobil Pegasus 710	40	121	13.2	98	6.5	0.896	1.0

Mobil Pegasus™ 801 is a premium performance gas engine oil intended for the lubrication of all classes of gas engines operating at low, medium and high speeds where low ash or ashless oils are recommended. It provides outstanding engine cleanliness and performance by helping to prevent the formation of carbon and ash deposits on pistons, in ring belt areas, on exhaust and intake ports, on valves and valve stems and in combustion chambers. Mobil Pegasus 801 also reduces the potential for port carboning of two-cycle gas engines. It minimizes engine wear and protects valve faces, seats and guides of turbocharged, four-cycle engines. Mobil Pegasus 801 provides exceptional protection against scuffing in demanding engine applications and also provides excellent protection against corrosion of internal engine components. Filter and oil life can be extended and the high performance capability of the Mobil Pegasus 801 can also help to extend the time between engine maintenance and overhaul periods.

Product	SAE Grade	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	TBN, mg KOH/g, ASTM D 2896	Sulfated Ash, wt% ASTM D 874
		cSt at 40°C	cSt at 100°C					
Mobil Pegasus 801	40	125	13.2	97	5 (-15)	480.2 (249)	2.2	0.13

Mobil Pegasus™ 805 Super is a premium performance gas engine oil developed to meet the rigorous demands of today's high output four-cycle engines which have been designed to reduce emissions and improve fuel-efficiency. These gas engines generally operate under high load and high temperature conditions and are subjected to a wide range of startup temperatures. Its high viscosity index and low temperature properties provide excellent cold start performance as well as exceptional high temperature lubrication characteristics.

Product	SAE Grade	Viscosity, ASTM D 445		V.I. wt% ASTM D 874	TBN, mg KOH/g, ASTM D 2896	Spec. Gravity 15.6° C/15.6°C, ASTM D 4052	Sulfated Ash, ASTM D 2270
		cSt at 40°C	cSt at 100°C				
Mobil Pegasus 805 Super	15W-40	115	14.5	128	6.4	0.88	0.5

Mobil Pegasus™ Special CF is a high quality SAE 15W-40 gas engine oil primarily intended for the lubrication of crankcases and power cylinders of spark-ignited two- and four-cycle gas-fueled engines. It is ideally suited for engines subjected to a wide range of ambient temperatures during startup and operation. This oil is uniquely formulated to be "Catalyst Friendly" and to meet the needs of engines with catalytic exhaust systems and stringent air emission requirements.

Product	SAE Grade	Viscosity, ASTM D 445		V.I. ASTM D 2270	TBN, mg KOH/g, ASTM D 2896	Sulfated Ash, wt% ASTM D 874
		cSt at 40°C	cSt at 100°C			
Mobil Pegasus Special CF	15W-40	104	13.7	132	2.4	<0.1

INDUSTRIAL LUBRICANTS

GEAR OILS – ENCLOSED GEARS

Mobil SHC™ Mobil SHC™ 600 Series lubricants are superb performance synthetic gear and bearing oils designed to provide outstanding service in terms of equipment protection, oil life and problem-free operation helping to enable increased customer productivity. These scientifically engineered oils are formulated using the latest proprietary and patent pending Mobil SHC technology to provide outstanding and balanced performance in demanding applications at high and low temperatures, well beyond the capabilities of conventional oils. The upgraded Mobil SHC 600 products feature excellent low temperature properties, as well as improved air release performance in the lower viscosity grades. These products are resistant to mechanical shear, even in heavily loaded gear and high shear bearing applications, so that there is virtually no loss of viscosity. ENERGY EFFICIENCY information on page 10.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 5950	Flash Point, °F (°C), ASTM D 92	FZG scuffing test, DIN 51534 (mod), A/16.6/90, Fail Stage
		cSt at 40°C	cSt at 100°C				
Mobil SHC 624	32	32	6.3	148	-70.6 (-57)	456.8 (236)	11
Mobil SHC 625	46	46	8.5	161	-65.2 (-54)	437 (225)	12
Mobil SHC 626	68	68	11.6	165	-59.8 (-51)	437 (225)	12
Mobil SHC 627	100	100	15.3	162	-49 (-45)	455 (235)	12
Mobil SHC 629	150	150	21.1	166	-43.6 (-42)	428 (220)	13
Mobil SHC 630	220	220	28.5	169	-43.6 (-42)	428 (220)	13+
Mobil SHC 632	320	320	38.5	172	-43.6 (-42)	437 (225)	13+
Mobil SHC 634	460	460	50.7	174	-38.2 (-39)	442.4 (228)	13+
Mobil SHC 636	680	680	69.0	181	-38.2 (-39)	437 (225)	13+
Mobil SHC 639	1000	1000	98.8	184	-27.4 (-33)	431.6 (222)	13+

Mobilgear™ 600 XP Series high performance gear oils have excellent extreme pressure characteristics and load-carrying properties, intended for use in all types of enclosed gear drives with circulation or splash lubrication systems. Mobilgear 600 XP Series gear oils are designed to stay ahead of the changing needs of gearbox technology. Gearbox technology design trends are towards smaller units with similar power throughput. This increase in power density places increased demands on gear oils. Mobilgear 600 XP Series oils are formulated to meet the stress by providing extra protection for gears, bearings and seals.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	FZG Scuffing, Fail Stage A/8.3/90	FZG Scuffing, Fail Stage A/16.6/90
	cSt at 40°C	cSt at 100°C					
Mobilgear 600 XP 68	68	8.8	101	-16.6 (-27)	446 (230)	12+	–
Mobilgear 600 XP 100	100	11.2	97	-11.2 (-24)	446 (230)	12+	12+
Mobilgear 600 XP 150	150	14.7	97	-11.2 (-24)	446 (230)	12+	12+
Mobilgear 600 XP 220	220	19.0	97	-11.2 (-24)	464 (240)	12+	12+
Mobilgear 600 XP 320	320	24.1	97	-11.2 (-24)	464 (240)	12+	12+
Mobilgear 600 XP 460	460	30.6	96	5 (-15)	464 (240)	12+	12+
Mobilgear 600 XP 680	680	39.2	90	15.8 (-9)	545 (285)	12+	12+

Spartan™ EP lubricants are a family of industrial extreme pressure gear lubricants. They are formulated with high quality mineral oils, which help reduce sludge formation helping to increase oil service life. Spartan EP oils contain a sulphur / phosphorus extreme pressure additive system that gives high load carrying ability and protection against wear. In addition, these oils provide strong protection against corrosion of steel and copper containing alloys and resist foaming. Spartan EP oils have good water handling properties so that water rapidly separates from the oil for easy water elimination.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	FZG Scuffing, DIN 51354, Fail Stage A/8.3/90, A/16.6/90
		cSt at 40°C	cSt at 100°C				
Spartan EP 150	150	150	14.7	97	-11.2 (-24)	446 (230)	12+
Spartan EP 220	220	220	19.0	97	-11.2 (-24)	464 (240)	12+
Spartan EP 320	320	320	24.1	97	-11.2 (-24)	464 (240)	12+
Spartan EP 460	460	460	30.6	96	5 (-15)	464 (240)	12+

Mobil SHC™ Mobil SHC™ Gear Series (ISO VG 150-1000) is a line of extra high performance, synthetic industrial gear oils designed to provide outstanding protection of gears and bearings, and extended oil life even under extreme conditions, helping to enable problem-free operation of equipment and increased customer productivity. These scientifically engineered synthetic lubricants are formulated from synthetic base fluids that have exceptional oxidation and thermal properties and excellent low temperature fluidity. The high viscosity index of these oils delivers less change in viscosity with changes in temperature, enabling wider operating temperature range and improved low temperature startup. Mobil SHC Gear Series lubricants contain an advanced proprietary additive system designed to provide excellent protection against conventional wear modes such as scuffing as well as a high level of resistance against micropitting fatigue. In addition, compared to conventional gear oil chemistries, it offers the potential for improved lubrication of gearbox rolling element bearings. Mobil SHC Gear Series products offer outstanding rust and corrosion protection relative to conventional gear oils, even in the presence of seawater contamination. They have excellent compatibility with ferrous and non-ferrous metals even at elevated temperatures. Mobil SHC Gear Series also exhibit excellent compatibility with elastomers in static seal tests. They have outstanding EP properties that provide protection even under shock load conditions. The synthetic base stocks used in Mobil SHC Gear Series oils have inherently low traction properties that result in low fluid friction in the load zone of non-conforming surfaces such as gears and rolling element bearings. Reduced fluid friction produces lower operating temperatures and improved gear efficiency. ENERGY EFFICIENCY information on page 10.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	FZG Scuffing, ISO 14635-1 (mod)	
		cSt at 40°C	cSt at 100°C				A/8.3/90, Fail Stage	ISO 14635-1 (mod) A/16.6/90, Fail Stage
Mobil SHC Gear 150	150	150	22.2	176	-65.2 (-54)	451.4 (233)	13	Not tested
Mobil SHC Gear 220	220	220	30.4	180	-49 (-45)	451.4 (233)	14	>14
Mobil SHC Gear 320	320	320	40.6	181	-54.4 (-48)	451.4 (233)	14	>14
Mobil SHC Gear 460	460	460	54.1	184	-54.4 (-48)	453.2 (234)	14	>14
Mobil SHC Gear 680	680	680	75.5	192	-43.6 (-42)	453.2 (234)	14	>14
Mobil SHC Gear 1000	1000	1000	99.4	192	-27.4 (-33)	453.2 (234)	14	>14

Mobil SHC™ Mobil SHC™ Gear 1500, 3200, and 6800 lubricants are high performance heavy-duty gear oils primarily designed enclosed gearing as well as slow-speed plain and rolling element bearings. They are designed to provide outstanding service in terms of equipment protection, oil life, and problem-free operation enabling increased customer productivity. These scientifically engineered synthetic lubricants are formulated from synthetic base fluids that have exceptional oxidation and thermal properties and excellent low temperature fluidity. The combination of a naturally high viscosity index and a unique additive system enables these products to provide outstanding performance under severe high and low temperature operating conditions. The nature of the synthetic base fluids also contributes to the products' excellent low temperature performance. They have excellent protection against gear scuffing and resistance to shock loading. The synthetic base stocks have inherently low traction properties that result in low fluid friction in the load zone of non-conforming surfaces such as gears and rolling element bearings. Reduced fluid friction produces lower operating temperatures and improved gear efficiency.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C) ASTM D 92	FZG test, ISO 14635-1 mod., Failure Stage
		cSt at 40°C	cSt at 100°C				
Mobil SHC Gear 1500	1500	1500	113	165	-0.4 (-18)	446 (230)	13+
Mobil SHC Gear 3200	--	3200	183	165	15.8 (-9)	446 (230)	13+
Mobil SHC Gear 6800	--	8200	365	180	21.2 (-6)	446 (230)	13+

INDUSTRIAL LUBRICANTS

GEAR OILS – ENCLOSED GEARS SPECIALTY

Mobil SHC™ Mobilgear SHC™ XMP Series lubricants are high performance synthetic wind turbine gear oils designed to provide outstanding equipment protection and oil life, even under extreme conditions. ExxonMobil's synthetic base oil technology provides exceptional oxidation resistance and thermal properties, naturally high viscosity index, excellent low temperature fluidity and the absence of undesirable compounds that are often found in mineral oils. Their high viscosity index and low traction coefficient combine to provide a significant reduction in power consumption in many gear drives. Mobilgear SHC XMP Series lubricants contain an advanced and carefully blended proprietary additive system designed to provide excellent protection against conventional wear modes such as scuffing, but also provide a high level of resistance against micropitting fatigue. Mobilgear SHC XMP Series products offer outstanding rust and corrosion protection versus conventional gear oils. They show no tendency to plug fine filters even when wet and have excellent compatibility with ferrous and non-ferrous metals even at elevated temperatures.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Spec. Gravity @ 15.6° C kg/l, ASTM D 4052	FZG Scuffing, DIN 51345 (mod) A/16.6/90, Fail Stage
		cSt at 40°C	cSt at 100°C					
Mobilgear SHC XMP 320	320	335	38.3	164	-36.4 (-38)	467.6 (242)	0.860	14+
Mobilgear SHC XMP 460	460	460	48.7	166	-32.8 (-36)	449.6 (232)	0.863	14+

Mobil SHC™ Mobil Glygoyle™ Series lubricants are high performance gear, bearing and compressor oils designed to provide outstanding benefits in terms of efficiency, long oil life, and equipment protection. These synthetic, polyalkylene glycol (PAG) lubricants were developed for use under operating conditions beyond the capabilities of other synthetic lubricants and mineral oils. Their low pour points ensure excellent low-temperature fluidity. The ISO 150 to 1000 grades are, of the quality level of NSF H-1 food industry use.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	FZG Test, ISO. Fail Load Stage
		cSt at 40°C	cSt at 100°C				
Mobil Glygoyle 68	68	68.0	11.8	170	-22 (-30)	509 (265)	10
Mobil Glygoyle 100	100	100.0	17.3	190	-22 (-30)	509 (265)	12+
Mobil Glygoyle 150	150	150.0	26.1	210	-27.4 (-33)	509 (265)	12+
Mobil Glygoyle 220	220	220.0	38.1	225	-27.4 (-33)	509 (265)	12+
Mobil Glygoyle 320	320	320.0	55.2	240	-27.4 (-33)	509 (265)	12+
Mobil Glygoyle 460	460	460.0	77.2	250	-27.4 (-33)	509 (265)	12+
Mobil Glygoyle 680	680	680.0	112.4	265	-27.4 (-33)	509 (265)	12+
Mobil Glygoyle 1000	1000	1000.0	165.8	285	-27.4 (-33)	500 (260)	12+

Mobil SHC™ Mobil SHC™ Gear 320 WT advanced wind turbine gear lubricant is a fully synthetic industrial gear lubricant designed to provide optimum equipment protection of wind turbine gear boxes and lubricant life even under extreme conditions. Mobil SHC Gear 320 WT advanced wind turbine gear lubricant contains advanced, scientifically engineered and balanced proprietary additive technology designed to provide excellent protection against conventional wear modes such as scuffing but also provides a high level of resistance against micropitting fatigue. In addition, compared to conventional gear oil chemistries, it offers the potential for improved lubrication of gearbox rolling element bearings. Mobil SHC Gear 320 WT advanced wind turbine gear lubricant offers outstanding rust and corrosion protection versus conventional gear oils. Mobil SHC Gear 320 WT shows no tendency to plug fine filters even when wet and has excellent compatibility with ferrous and non-ferrous metals, even at elevated temperatures.

Mobil SHC Gear 320 WT advanced wind turbine gear lubricant is recommended for lubrication of the main gear box in wind turbine power generation systems. It is especially recommended for applications that may be subject to micropitting: especially heavily loaded gearboxes with surface-hardened tooth metallurgies, which are typically used in wind turbines. It may also be used in gear applications where extreme low and/or high temperatures are encountered and applications where corrosion may be severe.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Spec. Gravity @ 15.6° C kg/l, ASTM D 4052	FZG Scuffing, DIN 51345 (mod) A/16.6/90, Fail Stage
		cSt at 40°C	cSt at 100°C					
Mobilgear SHC Gear 320 WT 320	320	320	42.1	187	-49 (-45)	492.8 (256)	0.854	14+

Mobil SHC™ Mobil SHC Cibus™ Series 24

Mobil SHC™ Mobil SHC™ Gear 22M and 46M are high performance ultra high viscosity synthetic lubricants designed specifically for use in heavily loaded, low speed open gears where boundary lubrication conditions often prevail. They are formulated from synthetic base stocks, which have remarkable low-temperature fluidity, even at such high viscosity grades. These ultra high viscosity products can be pumped over relatively long distances and use standard spray application equipment. The combination of a naturally high viscosity index and a unique additive system gives the products exceptional thermal/oxidative properties and provides outstanding performance under severe high and low temperature operating conditions even with very slow moving gears. The additive formulation also provides excellent gear scuffing protection, anti-wear performance and rust and corrosion inhibition.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Spec. Gravity, @ 15.6°C kg/l, ASTM D 4052
	cSt at 40°C	cSt at 100°C				
Mobil SHC Gear 22M	22,000	700	180	42.8 (6)	464 (240)	0.89
Mobil SHC Gear 46M	46,000	1375	180	59 (15)	464 (240)	0.924

Mobiltac™ 325 NC and 375 NC are extra high performance non-lead, diluent-type, heavy-bodied open gear lubricants designed for a wide variety of open gear and mining applications. They contain a non-chlorinated, volatile solvent that ensures fluidity during application, even at low temperatures. Once applied, the diluent evaporates and the lubricants take on a flexible, adhesive, high-strength consistency that is maintained throughout their service life. Mobiltac 375 NC and 325 NC adhere strongly to gear teeth and other machine elements to resist excessive throw-off, thereby providing a wear-resistant, viscous, continuous film that lubricates well under boundary conditions.

Mobiltac 375 NC is also available in spray can.

Product	Viscosity, ASTM D 445		Flash Point, °F (°C), ASTM D 92	Spec. Gravity, 15.6°C kg/l, ASTM D 1298
	cSt at 40°C w/diluent	cSt at 100°C w/o diluent		
Mobiltac 325 NC	1500	1000	230 (110)	0.95
Mobiltac 375 NC	5000	1260	275 (135)	0.96

Mobiltac™ Double Letter Series products are high performance, non-diluent type, heavy-bodied products intended for the lubrication of open gears over a wide range of environmental conditions and machine requirements. They incorporate extreme pressure additives for the protection of gear teeth and metal surfaces subject to extremely heavy loads. They form a cohesive and adhesive lubricating film that resists wear, water wash and excessive "throw off". They lubricate properly under boundary conditions. They resist peeling or flaking at sub-zero temperatures.

Product	Viscosity, ASTM D 445		Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C	
Mobiltac LL	1209	–	359.6 (182)
Mobiltac MM	3900	–	359.6 (182)
Mobiltac QQ	9526	217	374 (190)

INDUSTRIAL LUBRICANTS

OPEN GEAR LUBRICANTS (CONTINUED)

Mobil Dynagear™ Series of premium performance open gear lubricants is designed to provide outstanding protection of heavily loaded open gear sets exposed to a wide range of operating conditions. The Mobil Dynagear Series is based on lithium thickener technology, carefully chosen high performance additives and high viscosity semi-synthetic base fluids. These components synergistically provide a lubricant film that firmly adheres to lubricated surfaces. All members of the Mobil Dynagear Series are formulated solvent free and provide excellent dispensability without the use of chlorinated or hydrocarbon solvents.

The Mobil Dynagear Series' solvent free technology can help to significantly reduce run-off that can occur during lubricant application. Reduced run-off can help to establish a cohesive lubricating film quickly and enable optimization of the lubricant dispensing systems. A properly set-up dispensing system helps produce less waste while delivering the optimum lubricant film required to protect the gear set. The Mobil Dynagear Series can help reduce handling and waste disposal costs and the impact of fugitive emissions on the environment associated with the use of hydrocarbon solvents.

The Mobil Dynagear Series does not contain carbon black or asphalt. Additionally, the Mobil Dynagear Series does not form hardened tar-like materials in the gear tooth root, does not flake off at low temperatures, can help keep spray injectors from plugging and has excellent low temperature pumpability. The Mobil Dynagear Series premium performance technology enables simpler and potentially less expensive clean-up of the gear teeth and guard, helping to reduce the amount of maintenance and inspection work necessary on critical open gear systems.

Product	Viscosity, ASTM D 445		Flash Point, °C, ASTM D 92
	cSt at 40°C	cSt at 100°C	
Mobil Dynagear 800 Extra	680	60	-45
Mobil Dynagear 600 SL	620	60	-40
Mobil Dynagear 2000	2000	120	-20
Mobil Dynagear 4000	4000	—	-10

INDUSTRIAL LUBRICANTS

HEAT TRANSFER FLUIDS

Mobiltherm™ 43 is a formulated paraffinic type fluid designed for closed heat transfer systems operating at higher bulk temperatures including demanding open systems. It has a high specific heat and thermal conductivity to provide more rapid heating and greater flexibility in a system.

Product	Viscosity, ASTM D 445		Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Spec. Gravity
	cSt at 40°C	cSt at 100°C			
Mobiltherm 43	30.6	5.1	10.4 (-12)	390 (198)	43.3

Mobiltherm™ 603 heat transfer oil is a high performance product intended for use in closed indirect heating installations. It is formulated from highly refined base stocks that are resistant to thermal cracking and chemical oxidation. It has good heat transfer efficiency and its viscosity is such that it can be pumped readily at both start-up and operating temperatures. The flash point of the oil will not decrease significantly in service because of its resistance to thermal cracking at the operating temperatures for which it is recommended. Mobiltherm 603 is very thermally stable and capable of an extremely long service life without deposit formation or viscosity increase. It demonstrates specific heat and thermal conductivity that provides more rapid heat dissipation. Mobiltherm heat transfer oil is recommended for use in both closed and open, cold-oil sealed, indirect heating and cooling systems in all kinds of industrial processes.

Product	Viscosity, ASTM D 445		Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Spec. Gravity, @ 15 °C kg/l, ASTM D 4052
	cSt at 40°C	cSt at 100°C			
Mobiltherm 603	20.2	4.2	21.2 (-6)	374 min (190 min)	—

Mobil SHC™ Mobil SHC Cibus™ 32 HT 24

Mobil SHC™ Mobil SHC™ 500 Series are our highest performance hydraulic oils with widest temperature range capability. They have exceptional shear-stability and wear protection and are designed for extended service in high-pressure, high-temperature vane, piston and gear pump applications where sustained lubrication excellence is critical to productivity. These synthetic fluids have inherently excellent low and high temperature properties. These enable superb low temperature pumpability and start-up, and also ensure outstanding equipment protection at extremely high temperatures. ENERGY EFFICIENCY information on page 10.

Product	ISO VG	Viscosity, ASTM D 445		V.I ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
		cSt at 40°C	cSt at 100°C			
Mobil SHC 524	32	32	6.4	144	-68.8 (-56)	453.2 (234)
Mobil SHC 525	46	46	8.54	154	-65.2 (-54)	460.4 (238)
Mobil SHC 526	68	68	11.52	158	-63.4 (-53)	464 (240)
Mobil SHC 527	100	100	15.94	160	-61.6 (-52)	469.4 (243)

Mobil DTE 10 Excel™ Series hydraulic oils offer superb performance and energy efficiency benefits. These ashless, non-zinc oils are intended for use in high-speed, high-pressure, high output piston, vane and gear pumps operating under severe conditions where high levels of anti-wear, film strength and high temperature protection are needed. ENERGY EFFICIENCY information on page 10.

Product	ISO VG	Viscosity, ASTM D 445		V.I ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Brookfield Viscosity, ASTM D 2983			Dielectric Strength, kV, ASTM D877
		cSt at 40°C	cSt at 100°C				cP at -20° C	cP at -30° C	cP at -40° C	
Mobil DTE 10 Excel 15	15	15.8	4.07	168	-65.2 (-54)	359.6 (182)	-	-	2620	45
Mobil DTE 10 Excel 22	22	22.4	5.07	164	-65.2 (-54)	435.2 (224)	-	-	6390	54
Mobil DTE 10 Excel 32	32	32.7	6.63	164	-65.2 (-54)	482 (250)	1090	3360	14240	49
Mobil DTE 10 Excel 46	46	45.6	8.45	164	-49 (-45)	449.6 (232)	1870	7060	55770	41
Mobil DTE 10 Excel 68	68	68.4	11.17	156	-38.2 (-39)	464 (240)	3990	16380	-	-
Mobil DTE 10 Excel 100	100	99.8	13.00	127	-27.4 (-33)	496.4 (258)	11240	57800	-	-
Mobil DTE 10 Excel 150	150	155.6	17.16	120	-22 (-30)	492.8 (256)	34500	-	-	-

Mobil DTE™ 20 Series oils are premium performance anti-wear hydraulic oils. They meet the stringent requirements of hydraulic systems using high pressure, high output pumps. These products meet the most rigorous performance requirements of a wide range of hydraulic system and component manufacturers, allowing use of a single product with outstanding performance characteristics.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Spec. Gravity, @ 15.6° C/15.6° C, ASTM D 1298
		cSt at 40°C	cSt at 100°C				
Mobil DTE 21	10	10.0	2.74	98	-22 (-30)	345.2 (174)	0.845
Mobil DTE 22	22	21.0	4.5	98	-22 (-30)	392 (200)	0.860
Mobil DTE 24	32	31.5	5.29	98	-16.6 (-27)	428 (220)	0.871
Mobil DTE 25	46	44.2	6.65	98	-16.6 (-27)	449.6 (232)	0.876
Mobil DTE 26	68	71.2	8.53	98	-5.8 (-21)	456.8 (236)	0.881

Univis™ N Series oils are anti-wear hydraulic oils designed to satisfy a wide range of hydraulic equipment requirements. The products exhibit high viscosity indexes contributing to their low and high temperature properties making them a good choice for equipment that is subjected to a wide range of start-up and operating temperatures. They are designed to work with systems operating under moderate conditions where high levels of anti-wear protection are needed.

Product	ISO VG	Viscosity, ASTM D 445		V.I ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
		cSt at 40°C	cSt at 100°C			
Univis N 32	32	32	6.39	151	-54.4 (-48)	406.4 (208)
Univis N 46	46	46	8.19	152	-54.4 (-48)	420.8 (216)

INDUSTRIAL LUBRICANTS

HYDRAULIC FLUIDS

Univis™ HVI is a line of premium performance anti-wear hydraulic oils characterized by their unusually high viscosity indexes. They are engineered to maintain close viscosity control over wide temperature range applications. Because of their resistance to viscosity change, Univis HVI oils are for hydraulic systems that are subject to wide temperature variations. Many of these systems are sensitive to changes in viscosity of the hydraulic oil, since they depend on uniform viscosity for hydraulic accuracy. They exhibit optimum flow characteristics at sub-zero temperatures and the oils are resistant to shearing and viscosity loss so that system efficiency is maintained and internal pump leakage is minimized at high operating temperatures and pressures. These high quality hydraulic oils also provide very good anti-wear protection for high-pressure vane, piston and gear pumps. The Univis HVI oils are designed with excellent oxidation stability reducing deposit formation and improving pump and valve performance. They were developed in conjunction with the major original equipment manufacturers to meet the stringent requirements of severe hydraulic systems using high pressure, high output pumps as well as handling the critical requirements of other hydraulic system components.

Product	Viscosity, ASTM D 445		V.I ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C			
Univis HVI 13	13.5	5.3	404	-76 (-60)	213.8 (101)
Univis HVI 26	25.8	9.3	376	-76 (-60)	217.4 (103)

Nuto™ H Series oils are good quality anti-wear hydraulic oils intended for industrial and mobile service applications, subjected to moderate operating conditions and requiring anti-wear lubricants.

Product	ISO VG	Viscosity, ASTM D 445		V.I ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
		cSt at 40°C	cSt at 100°C			
Nuto H 32	32	32	5.4	104	-11.2 (-24)	413.6 (212)
Nuto H 46	46	46	6.7	104	-11.2 (-24)	438.8 (226)
Nuto H 68	68	68	8.5	107	-0.4 (-18)	453.2 (234)
Nuto H 100	100	100	11.1	95	5 (-15)	467.6 (242)

Mobil Aero™ HF Series 80

Mobil SHC™ Mobil SHC Cibus™ Series 24

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INDUSTRIAL LUBRICANTS

HYDRAULIC FLUIDS – ENVIRONMENTALLY AWARE

Environmentally Aware Hydraulic Fluid Considerations

Overview:

- Environmentally Aware refers to any goods and services, laws, guidelines and policies that claim to impose minimal or no harm on the environment.
- Four related product characteristics include biodegradability, aquatic toxicity, energy efficiency and “no sheen”.

Biodegradability

- Relates to the chemical breakdown of materials, such as petroleum products, by living organisms in the environment. Most petroleum products typically will completely biodegrade in the environment within two months to two years.
- Inherently Biodegradable – most lower viscosity mineral oil lubricants (up to ISO VG 320) meet the Organisation for Economic Co-operation and Development (OECD) “inherently biodegradable” classification, which means biodegradation better than 20 percent in 28 days or 12 weeks, depending on the test.
- Readily Biodegradable – biodegradation by more than 60 percent within 28 days, which precludes most, if not all, mineral oils.
- Biodegradability can impact a hydraulic fluid’s performance. For example, vegetable-based fluids are generally more readily biodegradable, but will not provide comparable service life to that of a standard mineral hydraulic fluid. However, synthetic ester-based fluids will likely offer extended service life, while also delivering a more biodegradable formulation.

Aquatic Toxicity

- Hydraulic fluids that claim to have a “low aquatic toxicity” need to have passed Organization for Economic Cooperation and Development (OECD) 202 or 203.
- Impact of zinc: there can be a misperception that any hydraulic fluid that does not contain zinc can be considered to have a low aquatic toxicity. While zinc content can influence aquatic toxicity test performance, zinc-free does not correlate directly to low aquatic toxicity.

Energy Efficiency

- Efficiency gains based on hydraulic fluid performance are obtained through excellent viscosity control, which includes shear stable, high viscosity index (VI) fluids and reduced traction coefficients.
- It’s important to seek out lubricants that have been tested based on ASTM D7721 “Standard Practice for Determining the Effect of Fluid Selection on Hydraulic System or Component Efficiency.” This protocol is a standardized method of testing that compares a lubricant’s energy efficiency to a conventional mineral oil-based fluid. (see Mobil DTE 10 Excel on page 11)

No Sheen

- Although visually unpleasing, an oil sheen allows for faster leak detection and aids in determining the source and severity of the oil spill. Oil spills without sheen are at greater risk of going undetected, which may result in greater environmental harm and higher operating costs.
- To help minimize potential environmental impact, the selection of a hydraulic fluid that generates an oil sheen is a preferred feature versus no or limited sheen.

Product	Viscosity, cSt @ 40°C	Temperature Range*, °F	Relative Service Life**	Biodegradability	Low Aquatic Toxicity	Energy Efficiency
Mobil EAL™ 224H	36	-4 to 140	Shorter	Readily	Yes	Not Tested
Mobil SHC™ Hydraulic EAL	32, 46, 68	-33 to 240	Longer	Readily	Yes	Yes
Mobil DTE 10 Excel™	15, 22, 32, 46, 68, 100, 150	-33 to 224	Longer	Inherently	Yes	Yes

* Temperature range should be adjusted for equipment minimum and maximum viscosity requirements.

** Relative service life compared to a conventional mineral oil hydraulic fluid.

Mobil SHC™ Mobil SHC™ Hydraulic EAL fluids are high performance, biodegradable, synthetic hydraulic oils for modern hydraulic systems. The fluids are designed to meet the demand for environmentally acceptable hydraulic lubricants. Mobil SHC Hydraulic EAL fluids are exceptionally high quality, wide-temperature, shear-stable hydraulic oils with controlled low-temperature pumpability properties and maximised anti-wear protection for hydraulic systems operating under high load and high pressures.

Product	ISO VG	Viscosity, ASTM D 445		V.I ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
		cSt at 40°C	cSt at 100°C			
Mobil EAL EnviroSyn H 32	32	31.1	6.2	152	-27.4 (-33)	539.6 (282)
Mobil EAL EnviroSyn H 46	46	43.3	7.7	149	-27.4 (-33)	568.4 (298)
Mobil EAL EnviroSyn H 68	68	71	11	144	-16.6 (-27)	557.6 (292)

Mobil DTE 10 Excel™ Series..... 34

Mobil EAL™ 224H is a premium performance environmentally aware hydraulic fluid designed to provide outstanding performance in hydraulic and circulation systems operating at moderate conditions. It provides excellent anti-wear and film strength characteristics necessary for hydraulic systems operating under high load and high pressures. Its 12-stage rating in the FZG Gear Load test demonstrates a high level of protection against wear and scuffing and the suitability of this product to protect gears and bearings used in conjunction with hydraulic systems. Mobil EAL 224H provides excellent protection against corrosion and ensures very good multi-metal compatibility allowing its use in systems employing various metallurgy that may be used in pump and component designs. It also provides very good thin oil film protection against rusting. In addition to its exceptional performance capability, it satisfies the requirements for ready biodegradability and non-toxicity making it a desirable product where leakage or spillage of conventional oils could result in damage to the environment.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Spec. Gravity, @ 15° C/15° C, ASTM D 1298
	cSt at 40°C	cSt at 100°C				
Mobil EAL 224H	36.78	8.3	212	-29.2 (-34)	561.2 (294)	0.921

INDUSTRIAL LUBRICANTS

HYDRAULIC FLUIDS – LESS FLAMMABLE

Nyvac™ FR 200D is an extra high performance water-glycol type less flammable hydraulic fluid. It is formulated with diethylene glycol as the main glycol component. The product does not contain ethylene glycol. Nyvac FR 200D provides excellent protection against rust and against vapour phase corrosion. In hydraulic pump tests, it has shown a high level of antiwear performance. A high viscosity index makes Nyvac FR 200D effective over a wide range of operating temperatures. Its foam resistance, low temperature flow and storage stability are also excellent.

Product	Viscosity, ASTM D 445		V.I ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Spec Gravity, @ 15.6° C/15.6° C, ASTM D 1298
	cSt at 40°C	cSt at 100°C			
NYVAC FR 200D	41.5	5.1	175	-22 (-30)	1.089

Pyrogard™ 53 is a high performance phosphate ester synthetic fluid designed to replace petroleum-based oils in hydraulic applications where operating conditions preclude the use of combustible petroleum products. Pyrogard 53 is approved by Factory Mutual (FM) as a less flammable fluid.

Product	Viscosity, ASTM D 445		Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Spec. Gravity, @ 15.6° C
	cSt at 40°C	cSt at 100°C			
Pyrogard 53	41.8	5.1	32 (0)	474.8 (246)	1.155

INDUSTRIAL LUBRICANTS

HYDRAULIC FLUIDS – FOOD INDUSTRY

Mobil SHC™ Mobil SHC Cibus™ Series	24
Mobil DTE™ FM Series	24

Mobilmet™ 420 Series products are high-performance multi-purpose cutting oils. They are chlorine-free, non-staining and non-corrosive oils for ferrous and non-ferrous metals. They are designed for light to moderate duty cutting operations and they are also suitable as machine tool lubricants and for use in light duty hydraulic systems. The oils are light-colored and transparent so that the work area can be clearly seen at all times. The Mobilmet 420 Series products are formulated to prevent the formation of oil mist in the vicinity of the machine tool.

Product	Viscosity, ASTM D 445		Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Spec. Gravity, @ 15° C kg/l, ASTM D 4052
	cSt at 40°C	cSt at 100°C			
Mobilmet 423	15	3.5	-4 (-20)	338 (170)	0.859
Mobilmet 426	32	5.7	10.4 (-12)	381 (194)	0.874
Mobilmet 427	46	6.9	14 (-10)	388 (198)	0.877

Mobilmet™ 447 is a high performance, multi-service, non-corrosive, chlorine-free, non-staining straight cutting fluid designed for heavy duty cutting operations. It is also suitable for machine tool lubrication and use as a hydraulic fluid in specific applications.

Product	Viscosity, ASTM D 445		V.I ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Spec. Gravity, @ 15° C kg/l, ASTM D 4052
	cSt at 40°C	cSt at 100°C				
Mobilmet 447	45.9	7.4	124	-0.4 (-18)	410 (210)	0.89

Mobilmet™ 760 Series oils are high performance oil-based cutting oils. They are chlorine-free and are intended for severe cutting operations, especially on difficult-to-machine steels. The active cutting oil technology is corrosive to copper and its alloys. In comparison with other leading premium cutting oils, Mobilmet 760 Series oils have demonstrated outstanding surface finish, extended tool life and control of built-up edge. Their light color enables the work area to be seen at all times. Closer tolerances are consistently achieved. These oils are formulated to prevent the formation of oil mist in the vicinity of the machine tool, thus contributing to a safer and more pleasant working environment.

Product	Kinematic Viscosity		Flash Point, °F (°C), COC	Spec. Gravity, @ 15° C kg/l, ASTM D 4052	Sulfur, Active
	cSt at 40°C	cSt at 100°C			
Mobilmet 762	10.0	3.0	284 (140)	0.87	1.6
Mobilmet 763	18.0	4.0	320 (160)	0.87	1.6
Mobilmet 766	36.0	6.0	356 (180)	0.88	1.6

Mobilgrind™ Series

The Mobilgrind series of products are non-staining mineral oils intended for conventional and high speed grinding and honing applications across a wide range of materials and operations. The high quality base oils and select additive systems offer clear, low misting and low odor lubrication that help to improve the workplace environment. Mobilgrind products are designed to prevent staining of non ferrous alloys and copper tubing that are often found in grinding oil circulation systems. Mobilgrind oils separate readily from grinding swarf and components which helps to reduce drag off and waste generation. The products are readily filterable to help increase surface finish accuracy. The Mobilgrind series is not formulated with any added zinc, chlorine or other materials that may require special disposal procedures.

Product	Viscosity, ASTM D 445		Flash Point, COC °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C	
Mobilgrind 13	4	—	248 (120)
Mobilgrind 14	6	2	302 (150)
Mobilgrind 24	7	2.5	266 (130)

INDUSTRIAL LUBRICANTS

METALWORKING FLUIDS – WATER SOLUBLE

Mobilcut™ 100 is a conventional soluble cutting fluid which forms a milky emulsion when mixed with water.

Product	Emulsion Type	Viscosity, cSt at 40°C	pH @ 10% Emulsion	Corrosion Test (IP 287) Breakpoint %	Spec. Gravity @ 15.6 °C	Refractometer Correction Factor
Mobilcut 100	Milky	32	10.0	2.7	0.881	1.0

Mobilcut™ 140 is a long-life, biostable, chlorine-free high-performance metal working fluid. When mixed with water, the emulsion formed has a milky appearance. Mobilcut 140 is formulated with high levels of lubricity additives to provide excellent performance in arduous machining operations.

Product	Appearance	Viscosity, cSt at 40°C	Emulsion Type	pH @ 5% Emulsion	Corrosion Test (IP 287) Breakpoint %	Spec. Gravity @ 20 °C	Refractometer Correction Factor
Mobilcut 140	Amber Liquid	59	Milky	9.1	3.0	0.95	1.5

Mobilcut™ 230, 250 are high-performance, multi-purpose water-soluble, semi-synthetic cutting fluids. They are formulated from high quality base oils, emulsifiers and additives to provide effective machining performance in moderate and heavy duty machining operations on ferrous and non-ferrous materials.

Product	Appearance	Viscosity, cSt at 40°C	Emulsion Type	pH @ 5% Emulsion	Corrosion Test (IP 287) Breakpoint %	Spec. Gravity @ 20 °C	Refractometer Correction Factor
Mobilcut 230	Amber Liquid	54	Translucent	9.3	3.0	0.97	1.5
Mobilcut 250	Dark Liquid	70	Semi-Translucent	9.7	3.0	0.95	1.5

Mobilcut™ 320 is a fully biostable mineral oil free metal working fluid. Specially formulated for high performance grinding and light duty machining, Mobilcut 320 is a carefully balanced product designed to give excellent machining and corrosion performance and long service life.

Product	Appearance	Viscosity, cSt at 40°C	Solution Appearance	pH	Corrosion Test (IP 287) Breakpoint %	Spec. Gravity @ 20 °C	Refractometer Correction Factor
Mobilcut 320	Yellow	5	Clear Colorless	9.4	2.5	1.10	1.4

Mobilcut™ 350 is a fully biostable, mineral oil-free synthetic metal working fluid. It is specially formulated for grinding and general cutting operations of ferrous materials. Mobilcut 350 is a carefully balanced product designed to provide excellent machining performance, long charge life and excellent tramp oil rejection properties. Mobilcut 350 is a universal product that meets the exacting demands of modern machine shops.

Product	Appearance	Viscosity, cSt at 40°C	Solution Appearance	pH	Corrosion Test (IP 287) Breakpoint %	Spec. Gravity @ 20 °C	Refractometer Correction Factor
Mobilcut 350	Amber Liquid	17.5	Clear	9.1	3.0	1.10	1.9

Mobilgear™ MS Series (formerly Mobil Mist Lube) are extra high performance oils designed for the oil-fog or mist-lubrication of machine components such as slideways, bearings, gears, chains etc. They are formulated from high quality, solvent refined base stocks and a unique additive system designed for optimum reclassifying properties. They have a high resistance to oxidation and good extreme pressure and anti-wear properties. The products have enhanced surface wetting capabilities and they reclassify (or agglomerate) readily from a mist to a liquid when the mist is subjected to extreme turbulence or is impinged onto a surface at high velocity. This allows a lubricating film to form on bearings and gears and prevents stray mist from escaping through narrow apertures into the atmosphere.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	FZG Scuffing, DIN 51534 A/8.3/90, Fail Stage
	cSt at 40°C	cSt at 100°C				
Mobilgear MS 32	32	5.5	110	10.4 (-12)	410 (210)	12+
Mobilgear MS 100	100	11.2	95	10.4 (-12)	453.2 (234)	12+
Mobilgear MS 320	320	25.0	100	15.8 (-9)	446 (230)	12+
Mobilgear MS 460	460	31.5	100	21.2 (-6)	460.4 (238)	12+

Mobil DTE 10 Excel™ Series 34

INDUSTRIAL LUBRICANTS

OTHER INDUSTRIAL OILS

Mobil™ Sawguide Oils are specifically formulated to lubricate and protect guides on modern gang saws the thin saw blades of modern gang saws and edgers. The oils are formulated to cling tenaciously to the guide in the presence of dirt and water to form an effective friction reducing film between the blade and the guide.

Product	ISO VG	Kinematic Viscosity		Pour Point, °F (°C)	Flash Point, °C
		cSt at 40°C	cSt at 100°C		
Mobil Sawguide Oil 68	68	68	9.6	-22 (-30)	419 (215)
Mobil Sawguide Oil 100	100	100	11.8	-11.2 (-24)	426.2 (219)
Mobil Sawguide Oil 150	150	150	16.2	-5 (-15)	437 (225)

Socony™ Oven Conveyor Lubricant is a high performance product designed specifically for the lubrication of oven conveyor chains at temperatures up to 200 degrees Celsius. It is formulated from a low viscosity oil and colloidal graphite. The oil acts as a carrier for the graphite and can penetrate between the moving parts. The oil is sufficiently volatile at the working temperature to evaporate without leaving residues that might cause sticking.

Product	Viscosity, ASTM D 445		Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C	
Socony Oven Conveyor Lubricant	13.3	3.7	464 (240)

Mobil™ Synthetic Oven Lube 1090 is a high performance synthetic high temperature lubricant designed specifically for lubrication of hot conveyor chains in drying ovens and similar severe applications. This product is formulated using a carefully balanced blend of high-molecular-weight synthetic hydrocarbons and a synthetic ester base fluid plus very effective anti-wear additives. It does not contain silicone. Compared to mineral oil and conventional chain lubricants, Mobil Synthetic Oven Lube 1090 reduces carbon build-up and extends cleaning intervals.

Product	ISO VG	Viscosity, ASTM D 445		Viscosity Index	Flash Point, °F (°C), ASTM D 92
		cSt at 40°C	cSt at 100°C		
Mobil Synthetic Oven Lube 1090	220	210	22	126	464 (240)

Mobil SHC™ Synturion™ 6 is a premium-quality, synthetic-base fluid specially formulated to meet the demanding lubrication and cooling requirements of mechanical seals - and to maximize seal life. The superb inherent properties of the synthetic base oil, enhanced by a proprietary additive package, are ideally suited to the special requirements of mechanical seal operation. NSF H1 for food industries.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Spec. Gravity, ASTM D 4052, @ 15°C
	cSt at 40°C	cSt at 100°C				
Synturion 6	5.2	1.89	135	-81.4 (-63)	334.4 (168)	0.799

Mobil™ System Cleaner is an oil-soluble, solvent-free cleaner that contains emulsifiers, dispersants, and rust inhibitors. It is safe for use with all ferrous and non-ferrous metals used in industrial equipment. A 5% concentration of Mobil System Cleaner in the system oil is typically recommended. The product is compatible with all seals up to 20% maximum concentration in the oil. Because of the viscosity and high flash point of Mobil System Cleaner, equipment can be operated normally during the cleaning process.

Product	Viscosity, ASTM D 445		Flash Point, °F (°C), ASTM D 97	Spec. Gravity, ASTM D 4052, @ 15°C
	cSt at 40°C	cSt at 100°C		
Mobil System Cleaner	55		280.4 (138)	0.926

Mobil SHC™ Mobil SHC™ PM Series products are high performance synthetic lubricants specifically designed for some of the most demanding industrial paper machine circulating systems. They are engineered to provide exceptional lubrication characteristics not attainable with conventional premium mineral oil-based fluids. The Mobil SHC PM Series oils are formulated to provide maximum protection for gears and bearings operating under some of the most severe conditions. They have very low pour points and a naturally high viscosity index (VI) which helps ensure good low temperature start-up while maintaining excellent viscosity characteristics at very high temperatures. The fluids are very shear stable and maintain viscosity control even when subjected to severe mechanical shear in heavily loaded bearings and gears. Their low traction coefficient and high viscosity index can help result in lower energy consumption and reduced component operating temperatures.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270, typical	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Spec. Gravity, 15.6° C/15.6° C, ASTM D 1298
		cSt at 40°C	cSt at 100°C				
Mobil SHC PM 220	220	225	25.6	127	-32.8 (-36)	428 (220)	0.863
Mobil SHC PM 320	320	325	34.7	130	-27.4 (-33)	428 (220)	0.865

Mobil DTE™ PM Series products are high-quality, high-performance lubricants specifically designed for demanding industrial paper machine circulating systems. They are engineered to provide exceptional lubrication qualities while protecting system components from rust and corrosion. This is particularly important in the wet-end where water and chemical contaminants can enter the lubrication system. They exhibit good viscosity characteristics allowing reduced start-up to production times while maintaining excellent viscosity characteristics at high temperatures. Mobil DTE PM Series oils provide excellent resistance to oxidation and thermal degradation, exceptional protection against rust and corrosion, and a high level of anti-wear performance.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270, min	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Spec. Gravity, 15.6° C/15.6° C, ASTM D 1298
		cSt at 40°C	cSt at 100°C				
Mobil DTE PM 100	100	100	11.4	95	21.2 (-6)	464 (240)	0.884
Mobil DTE PM 150	150	150	14.7	95	21.2 (-6)	482 (250)	0.888
Mobil DTE PM 220	220	220	19.0	95	21.2 (-6)	500 (260)	0.889
Mobil DTE PM 320	320	320	25.4	95	21.2 (-6)	482 (250)	0.892

Mobil DTE™ PM Ashless products are high-performance, lubricants specifically designed for demanding industrial paper machine circulating systems. They are engineered to provide exceptional lubrication qualities while protecting system components from rust and corrosion. This is particularly important in the wet-end where water and chemical contaminants can enter the lubrication system. They exhibit good viscosity characteristics allowing reduced start-up to production times while maintaining excellent viscosity characteristics at high temperatures. Mobil DTE PM Ashless Series oils provide excellent resistance to oxidation and thermal degradation, exceptional protection against rust and corrosion, and a high level of anti-wear performance.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270, min
		cSt at 40°C	cSt at 100°C	
Mobil DTE PM Ashless 150	150	150	14.6	97
Mobil DTE PM Ashless 220	220	220	18.7	97
Mobil DTE PM Ashless 320	320	320	24	97

INDUSTRIAL LUBRICANTS

PNEUMATIC TOOL OILS

Mobil Almo™ 500 Series lubricants are premium quality high performance products primarily intended for the lubrication of pneumatically operated rock drills in underground and surface mining operations. The Mobil Almo Series oils are formulated from high quality base stocks and additives, which provide excellent chemical stability and good protection against wear and corrosion. They offer an optimum balance of adhesiveness, yet are emulsifiable enough to pick up moisture carried in the air stream reducing the negative effects of water on wear and corrosion. They resist the formation of gummy deposits that could cause sluggish valve action. Even in the presence of water, the Mobil Almo 500 Series oils have good preferential metal-wetting properties that maintain continuous oil films. These properties in combination with high EP characteristics help provide excellent lubrication resulting in long equipment life.

Product	ISO VG	Viscosity, ASTM D 445		V.I ASTM D 2270	Pour Point, °C (°F), ASTM D 97	Flash Point, °C (°F), ASTM D 92, min
		cSt at 40°C	cSt at 100°C			
Mobil Almo 524	32	32	5.5	108	-59.8 (-51)	338 (170)
Mobil Almo 525	46	46	7.3	105	-22 (-30)	370.4 (188)
Mobil Almo 527	–	113	11.4	91	-16.6 (-27)	399.2 (204)
Mobil Almo 529	–	172	16.5	102	-11.2 (-24)	428 (220)
Mobil Almo 530	220	220	19.7	100	-11.2 (-24)	428 (220)
Mobil Almo 532	320	320	24.9	99	-5.8 (-21)	449.6 (232)

INDUSTRIAL LUBRICANTS

QUENCH OILS

Mobil Thermrex™ Series are a family of four quench oils for the heat treatment of alloy steels. They are comprised of selected additives and solvent-refined base stocks to provide optimum chemical and thermal stability, demulsibility, and nonferrous compatibility. The use of such ingredients results in quench oils that provide uniform steel hardness, long batch life, resistance to sludge formation, and minimum deformation.

Product	Viscosity, ASTM D 445		Flash Point, °F (°C), ASTM D 92	Quench Time, 300°C, sec	Quench Time, sec, Typ	Max Cooling Rate, ISO 9950, °F(°C)/SecMax	Temperature at Max Cooling Rate °C
	cSt at 40°C	Pour Point, °F (°C), ASTM D 97					
Mobil Thermrex D-10	20	27 (-3)	381 (194)	30	30	95 (54)	513
Mobil Thermrex R-21	21	10 (-12)	342 (172)	5	24	133 (64)	587
Mobil Thermrex V-32	16	27 (-3)	349 (176)	6	19	158 (72)	609

Mobil-Branded Refrigeration Lubricant Selection Guide for Industrial Systems

Listed here are some of the high-performance Mobil-branded industrial lubricants for refrigeration applications, each one formulated to offer outstanding equipment protection and extended oil life. These charts will help you determine which lubricant is most suitable for your system, based on the type of refrigerant fluid, evaporator temperature, and compressor type. For a complete list of Mobil-branded industrial lubricants, go to mobil.com/industrial. See other side for additional charts.

Mobil Gargoyle Arctic SHC™ 200 Series

high-performance synthetic lubricants for refrigeration compressors and heat pumps.

Features and Benefits:

Superb low-temperature capability provides excellent fluidity at low temperatures; resistance to viscosity loss due to refrigerant absorption under pressure for excellent bearing-film thickness and shaft-sealing properties.

N°	Lubricant	Technology	ISO VG
1	Mobil Gargoyle Arctic SHC 224	PAO (Polyalphaolefin)	32
2	Mobil Gargoyle Arctic SHC 226 E	PAO (Polyalphaolefin)	68
3	Mobil Gargoyle Arctic SHC 228	PAO (Polyalphaolefin)	100
4	Mobil Gargoyle Arctic SHC 230	PAO (Polyalphaolefin)	220
5	Mobil Gargoyle Arctic SHC 234	PAO (Polyalphaolefin)	400 cSt at 40°C

Gargoyle Arctic™ 155 & 300

high-performance naphthenic mineral oils for refrigeration compressors.

Features and Benefits:

Low pour point and good fluidity at very low temperatures. Good chemical stability. Suitable for both cylinder and bearing lubrication.

N°	Lubricant	Technology	ISO VG
7	Gargoyle Arctic Oil 155	MN (Mineral Naphthenic)	32
8	Gargoyle Arctic Oil 300	MN (Mineral Naphthenic)	68
	Gargoyle Arctic C Heavy	MN (Mineral Naphthenic)	46

HOW TO USE THIS REFRIGERATION LUBRICANT SELECTOR

- Obtain/confirm the following information on the application:
 - REFRIGERANT FLUID** in use (ASHRAE designation)
 - Evaporator is of dry type (oil carryover less than 15%) and **EVAPORATOR TEMPERATURE** in °C
 - COMPRESSOR TYPE** and outlet temperature
- To identify the Mobil-branded lubricant(s) suitable for use in the type of compressor, please refer to the row that corresponds to the refrigerant fluid and the evaporator temperature.
- If mineral and synthetic lubricants are both indicated, synthetic lubricants will in general offer a higher level of performance than mineral oils with respect to equipment protection, particularly at high- and low-operating temperatures, compressor efficiency, and oil life.
- For information on builder approvals for Mobil-branded refrigeration lubricants, please refer to Table 2 on the back page.
- For further clarification or assistance, please contact your local representative or ExxonMobil technical help line.

Mobil EAL Arctic™ Series

high-performance Polyol Ester (POE) lubricants for refrigeration compressors and systems.

Features and Benefits:

Specifically designed for use with ozone-friendly HFC refrigerant fluids; formulated from synthesized Polyol Esters to provide outstanding lubricity and wear protection, as well as chemical and thermal stability.

N°	Lubricant	Technology	ISO VG
9	Mobil EAL Arctic 22 or 22CC***	POE (Polyol Ester)	22
10	Mobil EAL Arctic 32	POE (Polyol Ester)	32
11	Mobil EAL Arctic 46	POE (Polyol Ester)	46
12	Mobil EAL Arctic 68	POE (Polyol Ester)	68
13	Mobil EAL Arctic 100	POE (Polyol Ester)	100
14	Mobil EAL Arctic 220	POE (Polyol Ester)	220

Mobil Glygoyle™ 22

synthetic Polyalkylene Glycol-based (PAG) lubricant suitable for specific refrigeration applications.

Features and Benefits:

Polyalkylene Glycol-based. Shear-stable lubricant with outstanding resistance to thermal degradation and the formation of sludge and deposits. Suitable for HC (hydrocarbon) or CO2 refrigerant fluid applications.

N°	Lubricant	Technology	ISO VG
15	Mobil Glygoyle 22	PG (Polyglycol)	150

Mobil Zerice™ S Series

premium synthetic refrigeration compressor lubricants for ultralow temperature applications.

Features and Benefits:

Outstanding solubility with halocarbon refrigerants, helping avoid oil separation and congealing on the valve and heat-transfer surfaces of the refrigeration system. Very low pour and floc points prevent harmful wax precipitation blocking expansion valves and heat-transfer surfaces.

N°	Lubricant	Technology	ISO VG
16	Mobil Zerice S 32	AB (Alkylbenzene)	32
17	Mobil Zerice S 68	AB (Alkylbenzene)	68
18	Mobil Zerice S 100	AB (Alkylbenzene)	100

*For new units **For existing units ***For Emerson Copeland pistons compressors or where indicated with ***, use only 22CC grade

NOTE:

- For equipment under warranty, please refer to equipment builder recommendations.
- In changing refrigeration oil technology or brands, ensure thorough flushing of the system to minimize contamination with the old technology or brand.

This guide is for refrigeration lubricant selection for industrial systems with dry type evaporators (i.e., oil carryover into evaporator less than 15%). To select a lubricant for other types of refrigeration systems, please contact your local representative or the ExxonMobil technical help line for assistance.

INDUSTRIAL LUBRICANTS

REFRIGERATION OILS

TABLE 1: Refrigeration Lubricant Selector

ASHRAE Name	REFRIGERANT FLUID		EVAPORATOR TEMPERATURE		COMPRESSOR TYPE			Centrifugal
	Type	Transition or Substitute of	From (°C)	To (°C)	Piston	Screw		
R12	CFC		-40	+40	7	8	5	
R502	CFC		-50	-20	7	8	18	
R22	HCFC		-25	+10	7	2*	18	8
R22	HCFC		-30	+10	16	2*	18	8
R22	HCFC		-40	+10	16		18	8
R22	HCFC		-50	+10	16		17	8
R123	HCFC	R11	0	+20				8
R124	HCFC	R114	0	+80	8	18		8
R401a	HCFC	R12	-20	+10	7	16		
R402a	HCFC	R502	-50	-30	16			
R408a	HCFC	R502	-50	-30	16	18		
R409a	HCFC	R12	-20	+10	7	16		
R290	C ₃ H ₈ (propane)		-30	+20	8	15		15
R600/600a	Butane & Iso But.		-30	+20	8	15		15
R717	NH ₃ (ammonia)		-30	+10	8	8	2*	8
R717	NH ₃ (ammonia)		-50	+10		2*	2*	8
R744	CO ₂		-55	-10				
R23	HFC		-100	-40	9			
R134a	HFC	R12	-20	+10	10	14		12
R134a	HFC	R12	-30	+10	9	13		12
R404a	HFC	R502	-40	-30	10	14		12
R404a	HFC	R502	-50	-30	9	13		12
R407c	HFC	R22	0	+10	12	14		
R410a	HFC		-45	+10	9	13		12
R410a	HFC		-25	+10	10	14		12
R410b	HFC		-25	+10	10	14		12
R417a (Isceon M059)	HFC	R22	-15	+15	12	14		12
R422a (Isceon M079)	HFC	R22	-45	-5	9	13		12
R422a (Isceon M079)	HFC	R22	-25	-5	10	14		12
R422d (Isceon M029)	HFC	R22	-45	+10	9	13		12
R422d (Isceon M029)	HFC	R22	-25	+10	10	14		12
R427a (FX 100)	HFC	R22	-40	+10	9	13		12
R427a (FX 100)	HFC	R22	-20	+10	11	14		12
R507/507a	HFC		-40	0	9	13		12
R507/507a	HFC		-20	0	11	14		12

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TABLE 2: Builder Approvals for Mobil-branded Refrigeration Oils

Mobil-branded refrigeration lubricant product recommendations, according to equipment builder approvals and refrigerant type.

Builder	Country	BUILDER-APPROVED REFRIGERATION OIL TECHNOLOGY (COLOR) AND MOBIL-BRANDED REFRIGERATION OIL(S) (TEXT)					
		HCFC	HFC	NH ₃	HC	CO ₂	
Johnson Controls-Sabroe	Denmark	18	12,13,14	2, 3, 4			
Bitzer	Germany	3 17(P)	9***,10,12(P)	8(P)			
GEA Grasso	Netherlands	16(S) 17(S,P)	12(S,P),13(S)	8(S) 16(S) 2(S)	15		
Carrier	France	7(P),8(P) 16(P)	12(P)				
Frascold	Italy		10,12(P)				
Dorin	Italy		10,11				
Emerson Copeland	USA	(S)	9***				
Carrier	USA	(S)	9***(Scr),12				
Wuhan McQuay	China		12				

TABLE 3: Builders with Specific Lubricant Technology Requirements

Mobil-branded refrigeration lubricant product technology recommendations, according to equipment builder.

When under warranty, please refer to equipment manual.

Builder	Country	BUILDER-APPROVED REFRIGERATION OIL TECHNOLOGY (COLOR)					
		HCFC	HFC	NH ₃	HC	CO ₂	
Johnson Controls — York	Denmark						
Johnson Controls — Frick	Denmark						
Danfoss	Denmark						
Howden	UK						
Bristol	USA						
Mycom	USA						
Vilter	USA						
Daikin	Japan						
MHI	Japan						
Kobe Steel	Japan						
Chongqing General Industry Co	China						

P = Piston Compressor S = Screw Compressor Scr = Scroll
 *For new units **For existing units ***For Emerson Copeland pistons compressors or where indicated with ***, use only 220C grade

QUESTIONS?

CALL THE EXXONMOBIL
TECHNICAL SUPPORT CENTER AT

1-800-662-4525

mobil.com/industrial | mobildelvac.com | mobil.com

Mobilaroma™ 200 Series rust preventives are designed to protect metal surfaces from rust and corrosion. They are formulated using light-bodied petroleum solvents with polar rust preventive, water displacement and fingerprint neutralising additives. These rust preventives are easy to apply and easy to remove making their application less man-power intensive. Mobilaroma 245 is suited for the thin-film protection of finely finished parts between machining operations, including operations where water-soluble cutting and grinding fluids have been used. It is also suitable for use just before parts are packaged for storage or shipment, or to “dry” parts as a temporary protection until a heavier rust preventive can be applied. Mobilaroma 247 is the heavier duty rust preventive designed to provide long term protection under more adverse conditions.

Product	Viscosity, ASTM D 445		Flash Point,
	cSt at 40°C		°F (°C), ASTM D 92
Mobilaroma 245	2.6		100.4 (38)
Mobilaroma 247	3.0		159.8 (71)

Mobilaroma™ 500 Series oils are premium performance products primarily intended as run-in or lay-up lubricants, which provide effective rust preventive films on the internal surfaces of machinery. They are particularly suitable as run-in lubricants for diesel and gasoline engines. The oils displace water from metal surfaces and form strong water-resistant films on the metal surfaces to prevent rust and corrosion. The Mobilaroma 500 Series oils absorb the water in systems into a water-in-oil emulsion so that the contact surfaces of the machinery still get satisfactory lubrication. Their high level of chemical stability and their anti-wear and detergent properties make them suitable as high quality short-term lubricants.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point,	Flash Point,
	cSt at 40°C	cSt at 100°C		°F (°C), ASTM D 97, max	°F (°C), ASTM D 92, min
Mobilaroma 522	28.8	5.0	95	-11.2 (-24)	359.6 (182)
Mobilaroma 524	88.4	10.5	95	-0.4 (-18)	424.4 (218)

Mobilaroma™ 700 Series premium performance rust preventives that cover a range of applications including storage and inter-operational activities. Mobilaroma 778 is intended for protection of cold-rolled sheet and coiled steel in the metal industry. Mobilaroma 798 is intended for the lubrication and rust protection of wire rope in industrial, construction, mining and marine applications. The Mobilaroma 700 Series products exhibit excellent water displacing properties and form thin tenacious films that protect surfaces even under severe conditions that include high moisture levels and exposure to acid or corrosive fumes.

Product	Viscosity, ASTM D 445		Pour Point, °F (°C), ASTM D 97	Flash Point,	Spec. Gravity,
	cSt at 40°C	cSt at 100°C		°F (°C), ASTM D 92	ASTM D 1298
Mobilaroma 778	21	–	26.6 (-3)	374 (190)	0.880
Mobilaroma 798	–	23.1	–	460.4 (238)	–

Mobil Vaprotec™ Light is an ISO Viscosity Grade 32, turbine-quality circulation oil containing anti-oxidants and defoamants. It is enhanced with a three-phase rust inhibitor to protect surfaces lightly coated with oil; a liquid phase inhibitor to protect surfaces submerged in oil; and vapor space inhibitors to protect surfaces exposed to oil vapors.

Product	Viscosity		V.I.	Pour Point,	Flash Point,	Spec. Gravity
	cSt at 40°C	cSt at 100°C		°F (°C), ASTM D 97	°F (°C), ASTM D 92, min	
Mobil Vaprotec Light	30	5.3	95	19.4 (-7)	379.4 (193)	0.875

INDUSTRIAL LUBRICANTS

SPINDLE OILS

Mobil Velocite™ Oil Numbered Series oils are premium performance products primarily designed for the lubrication of high-speed spindles in machine tools. They are also used in some critical hydraulic, circulation systems and air line oilers where the appropriate viscosity grade is selected. They are formulated from select high-quality, low viscosity base oils and additives that impart good resistance to oxidation and protection from rust and corrosion. They possess very good resistance to foaming and separate readily from water.

Product	ISO VG	Viscosity, ASTM D 445		Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
		cSt at 40°C	cSt at 100°C		
Mobil Velocite No 3	2	2.1	0.95	-32.8 (-36)	183.2 (84)
Mobil Velocite No 6	10	10.0	2.62	5 (-15)	356 (180)
Mobil Velocite No 8	15	15.0	3.28	15.8 (-9)	381.2 (194)
Mobil Velocite No 10	22	22.0	4.0	-22 (-30)	413.6 (212)

INDUSTRIAL LUBRICANTS

TRANSFORMER OIL

Univolt™ N 61 B is a transformer oil that provides cooling, insulating and arc quenching while meeting the requirements of an ASTM D 3487 Type II fluid. Univolt N 61 B is a fully inhibited Type II oil, which provides outstanding performance in transformers, circuit breakers, switches, and capacitors. *Not available in bulk.*

Product	Viscosity, ASTM D 445		Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Spec. Gravity, D 1298
	cSt at 40°C	cSt at 100°C			
Univolt N 61 B	9.8	2.4	19.4 (-50)	303.8 (151)	0.8890

INDUSTRIAL LUBRICANTS

TURBINE OILS

Mobil SHC™ Mobil SHC™ 800 Series turbine oils are designed specifically to meet the needs some of the most severe industrial gas turbine applications with a nominal 10,000 hour TOST life. They are recommended for the lubrication of land-based gas turbines, particularly units under 3,000 hp used as standby power units, and in some types of total energy and combined cycle (gas/steam) systems. This innovative product family is formulated from wax-free synthesized hydrocarbons and a unique additive system. This formula provides outstanding low temperature fluidity and exceptional resistance to degradation at high temperatures well beyond the capabilities of premium quality mineral oils. Mobil SHC 800 Series lubricants also provide excellent antiwear properties as well as protection against rust and corrosion plus good air release performance and resistance to foaming.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Spec. Gravity, 15.6° C kg/L, ASTM D 4052
		cSt at 40°C	cSt at 100°C				
Mobil SHC 824	32	31.5	5.9	135	<-65.2 (<-54)	478.4 (248)	0.83
Mobil SHC 825	46	43.9	7.9	145	-49 (-45)	478.4 (248)	0.83

Mobil DTE™ 932 GT is a high performance turbine oil designed for use in GE large frame gas turbines. This product is based on selected high quality base oils carefully balanced with a proprietary additive system to provide long oil life in combination with industry leading “keep clean” performance. The formulations also include a non-zinc antiwear system to meet the load carrying requirements of geared turbines

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Spec. Gravity, 15.6° C/ 15.6° C, ASTM D 4052
		cSt at 40°C	cSt at 100°C				
Mobil DTE 932 GT	32	31.5	6.1	141	-0.4 (-18)	464 (240)	0.84

Mobil DTE™ 732 M is a high performance turbine oil designed for use in Mitsubishi Heavy Industry (MHI) non-geared Single Shaft Heavy Duty Gas & Steam Turbines and Multi Shaft Gas Turbines. This product meets MHI's requirements for long life – high temperature turbine applications, MS04-MA-CL005, through high quality base oils and additive system designed to provide long oil life. Mobil DTE 732 M also meets the requirements of MS04-MA-CL001 and CL002.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
		cSt at 40°C	cSt at 100°C			
Mobil DTE 732 M	32	31.3	5.8	131	5 (-15)	451.4 (233)

Mobil DTE™ 800 Series high performance turbine oils are designed for use in steam turbines, gas turbines and combined cycle gas turbine (CCGT) applications under some of the most severe operating conditions. These progressive products are based on high quality hydrotreated basestocks for exceptional thermal/oxidation resistance along with specially chosen additives engineered to provide the deposit control and “keep-clean” performance required by severe duty gas turbines as well as excellent water separability needed for steam turbine operation. The formulations also include a non-zinc antiwear system to meet the load carrying requirements of geared turbines.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Spec. Gravity, 15.6° C/ 15.6° C, ASTM D 4052
		cSt at 40°C	cSt at 100°C				
Mobil DTE 832	32	29.6	5.4	110	-22 (-30)	435.2 (224)	0.86
Mobil DTE 846	46	42.4	6.2	106	-22 (-30)	471.2 (244)	0.87

Mobil DTE™ 700 Series are zinc-free turbine lubricants specifically designed for use in gas and steam turbine applications. Mobil DTE 700 Series lubricants are formulated with carefully selected basestocks and additives, including antioxidants, rust and corrosion inhibitors and anti-foam agents. These components provide outstanding resistance to oxidation and chemical degradation over time. Mobil DTE 700 lubricants exhibit excellent water separability, resistance to emulsion formation and anti-foaming characteristics which provide reliable operation. Their enhanced air release properties are critical for turbine hydraulic control mechanisms.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
		cSt at 40°C	cSt at 100°C			
Mobil DTE 732	32	30	5.5	117	-22 (-30)	442.4 (228)
Mobil DTE 746	46	44	6.8	113	-22 (-30)	446 (230)

Mobil™ System Cleaner (turbine-related product)..... 43

INDUSTRIAL LUBRICANTS

WAY OILS

Mobil Vactra™ Oil Numbered Series are premium-quality slideway lubricants specifically designed to meet the requirements for accuracy, aqueous coolant separability, and equipment protection of precision machine tools.

Product	ISO VG	Viscosity, ASTM D 445		Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
		cSt at 40°C	cSt at 100°C		
Mobil Vactra No. 1	32	32	32	-22 (-30)	420.8 (216)
Mobil Vactra No. 2	68	68	68	-27.4 (-33)	442.4 (228)
Mobil Vactra No. 3	150	156	156	21.2 (-6)	478.4 (248)
Mobil Vactra No. 4	220	221	221	26.6 (-3)	464 (240)

Mobil Vacuoline™ 1400 Series oils are extra high performance lubricants specifically designed to satisfy the requirements of machine tools that use one oil for both hydraulic systems and way lubrication. They are formulated using high quality mineral base oils and a unique additive technology that provides excellent lubricity properties to eliminate stick-slip and chatter of heavily loaded and vertical box ways. They exhibit a high degree of oxidation and thermal stability that increases the service life and helps keep lubricated surfaces clean and free from corrosion or deposits that could detract from finished parts quality and accuracy. Mobil Vacuoline 1400 Series provide the optimum balance between these divergent requirements.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97, max	Flash Point, °F (°C), ASTM D 92
		cSt at 40°C	cSt at 100°C			
Mobil Vacuoline 1405	32	32	5.3	96	10.4 (-12)	410 (210)
Mobil Vacuoline 1409	68	68	8.57	96	21.2 (-6)	424.4 (218)
Mobil Vacuoline 1419	220	215	19.0	96	21.2 (-6)	494.6 (257)

COMMERCIAL VEHICLE PRODUCT LISTING BY APPLICATION

COMMERCIAL VEHICLE LUBRICANTS	PRODUCT	PAGE
HEAVY DUTY DIESEL ENGINE OILS	Multigrade HDEO Selector Check Chart.....	55
	Mobil Delvac 1™ ESP 5W-30	55
	Mobil Delvac 1™ ESP 5W-40	56
	Mobil Delvac™ Extreme 15W-40 and 10W-30.....	56
	Mobil Delvac™ 1300 Super 10W-30 and 15W-40.....	56
	Mobil™ HDEO 15W-40 and 10W-30	57
	Mobil Delvac™ MX F2 15W-40.....	57
	Mobil Delvac™ 1600 Monogrades	57
	Mobil Delvac™ 1200 Series.....	57
	Mobil Diol™ 9 RD Series.....	57
HEAVY DUTY POWER TRANSMISSION FLUIDS	Mobil DIOL™ 11 RD Series.....	58
	Mobil Delvac 1™ Transmission Fluid 50.....	58
	Mobil Delvac 1™ Transmission Fluid Arctic	58
	Mobil Delvac 1™ ATF.....	58
	Mobil Delvac 1™ Gear Oils.....	58
	75W-90 and 80W-140	58
	Mobil™ Hydraulic 10W	58
	Mobilfluid™ 424	61
	Mobilfluid™ LT	61
	Mobilube™ HD 80W-140.....	61
	Mobilube™ HD 80W-90.....	61
	Mobilube™ HD Plus 80W-90 and 85W-140	62
	Mobilube™ XFD 50 and 60	62
	Mobiltrans™ AST.....	62
Mobil SHC Gear OH Series	62	
Mobiltrans™ HD 10W, 30, 50, and 60.....	63	
TRACTOR HYDRAULIC FLUIDS	Mobilfluid™ 424	63
	Mobilfluid™ LT	63
COOLANT/ANTIFREEZE	Coolant/Antifreeze Selector	64
	Mobil Delvac™ Extended Life	64
	Mobil™ Heavy Duty SCA Precharged	64
	Mobil Permazone™.....	64

COMMERCIAL VEHICLE LUBRICANTS

HEAVY DUTY DIESEL ENGINE OILS

Multigrade Heavy Duty Engine Oils Selector Check Chart

Choose the best protection for your vehicle		Advanced wear protection	Extended drain capability	Emissions system protection	Low temperature start-up	Fuel economy potential
Mobil Delvac 1™ ESP 5W-40	Ultimate performance beyond expectations	★★	★★★	★★	★★★	★
Mobil Delvac™ Extreme FE 10W-30	Peace of mind even in the most extreme conditions	★★	★★★	★★	★★	★★
Mobil Delvac Extreme 10W-30	Peace of mind even in the most extreme conditions	★★	★★★	★★	★★	★
Mobil Delvac 15W-40	Peace of mind even in the most extreme conditions	★★	★★★	★★	★	—
Mobil Delvac™ Super FE 10W-30	Run business with confidence	★★	★★	★★	★★	★★
Mobil Delvac 1300 Super 10W-30	Run business with confidence	★★	★★	★★	★★	★
Mobil Delvac 1300 Super 15W-40	Run business with confidence	★★	★★	★★	★	—

The number of stars indicates relative performance level

Mobil Delvac 1™ **Mobil Delvac 1™ LE 5W-30** is a fully synthetic, heavy-duty diesel engine oil that combines advanced engine protection for modern low emissions vehicles with Enhanced Fuel Economy Potential¹ and other sustainability-related benefits such as engine durability, emissions system protection and extended drain capability. Mobil Delvac 1 LE 5W-30 utilizes state-of-the-art technology to deliver exceptional performance and is well suited for an extensive array of diesel-powered commercial vehicles for both on- and off-highway use in industries such as transportation, mining, construction and agriculture. Mobil Delvac 1 LE 5W-30 meets or exceeds an extremely broad range of industry and manufacturer specifications from around the world.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2700	Sulfated Ash, wt%, ASTM D 874	Total Base #, mg KOH/g, ASTM D 2896	Pour Point, °F (°C), ASTM D 97
	cSt at 40°C	cSt at 100°C				
Mobil Delvac 1 LE 5W-30	69	11.8	168	1.0	10	-59.8 (-51)

¹ Relative to conventional 15W-40 engine oil — Actual fuel economy improvement is dependent on vehicle/equipment type, outside temperature, driving conditions and your current fluid viscosity.

Mobil Delvac 1™ **Mobil Delvac 1™ ESP 5W-40** is an advanced synthetic heavy duty diesel engine oil that helps extend engine life while providing long drain capability and potential fuel economy for modern diesel engines operating in severe applications. This product is formulated to deliver exceptional performance in modern and older hard working engines, including those with emission control systems. Mobil Delvac 1 ESP 5W-40 is recommended for use in a wide range of heavy-duty applications and operating environments found in the on-road transport and off-road mining, forestry, construction, and agricultural industries.

The outstanding performance of Mobil Delvac ESP 5W-40 is the result of extensive cooperative development work with major equipment builders and application of the latest lubrication technology. As a result, this product meets or exceeds the requirements of the latest API and ACEA industry specifications for diesel engine oils, as well as the requirements of many major American, and European engine manufacturers.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Sulfated Ash, wt%, ASTM D 874	Total Base #, mg KOH/g, ASTM D 2896	Pour Point, °F (°C), ASTM D 97
	cSt at 40°C	cSt at 100°C				
Mobil Delvac 1 ESP 5W-40	81.1	13.56	170	1.0	12.1	-27.4 (-33)

Mobil Delvac™ **Mobil Delvac™ Extreme 15W-40 and 10W-30** are premium synthetic-blend, high performance, diesel engine oils that help extend engine life while providing long drain capability for modern diesel engines operating in extreme conditions. They are recommended for use in a wide range of heavy-duty applications and operating environments found on-and off-highway, including engines operating under heavy loads. They are fully backwards compatible with the CJ-4 API specification.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Sulfated Ash, wt%, ASTM D 874	Total Base #, mg KOH/g, ASTM D 2896	Pour Point, °F (°C), ASTM D 97
	cSt at 40°C	cSt at 100°C				
Mobil Delvac Extreme 10W-30	81.1	11.8	140	1.0	10.3	-43.6 (-42)
Mobil Delvac Extreme 15W-40	107	14.3	140	1.0	10.3	-27.4 (-33)

Mobil Delvac™ **Mobil Delvac™ 1300 Super 15W-40 and 10W-30** are advanced diesel engine oils that help extend engine life, allowing you to run your business with confidence. These products meet or exceed original equipment manufacturer (OEM) requirements and deliver high performance in both on and off-highway applications. Fully backward compatible, Mobil Delvac™ 1300 Super delivers exceptional performance in both newer and older heavy duty engine designs. Accordingly, these oils meet or exceed the requirements of APICK-4, CJ-4 and CI-4 PLUS service categories, as well as key OEM requirements. Mobil Delvac™ 1300 Super oils are universal, meaning they may also be used in gasoline engines requiring the API SN specification.

Mobil Delvac™ 1300 Super is a tailored formulation that delivers excellent wear and engine protection, extended drain capability, outstanding high temperature performance and engine cleanliness. Developed in close collaboration with major OEMs, Mobil Delvac™ 1300 Super is recommended for use in a wide range of heavy duty applications and operating environments in the trucking, mining, construction, agricultural and marine industries.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Sulfated Ash, wt%, ASTM D 874	Total Base #, mg KOH/g, ASTM D 2896	Pour Point, °F (°C), ASTM D 97
	cSt at 40°C	cSt at 100°C				
Mobil Delvac 10W-30	81.9	12	140	0.9	9.8	-27.4 (-33)
Mobil Delvac 15W-40	109	14.1	130	0.9	9.8	-27.4 (-33)

COMMERCIAL VEHICLE LUBRICANTS

HEAVY DUTY DIESEL ENGINE OILS

Mobil™ HDEO 15W-40 and 10W-30 are oils designed to meet warranty requirements for high-speed, four-stroke heavy duty diesel engines. These products are formulated to maintain the durability of emission control systems, including diesel particulate filters and other advanced aftertreatment systems. Mobil HDEO meets or exceeds the requirements of API service classifications CK-4, CJ-4 and CI-4 PLUS. These products are also approved by major original equipment manufacturers (OEM).

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Sulfated Ash, wt%, ASTM D 874	Total Base #, mg KOH/g, ASTM D 2896	Pour Point, °F (°C), ASTM D 97
	cSt at 40°C	cSt at 100°C				
Mobil HDEO 10W-30	81.3	11.9	140	1.0	10	-32.8 (-36)
Mobil HDEO 15W-40	112	14.2	132	1.0	10	-16.6 (-27)

Mobil Delvac™ Mobil Delvac™ MX F2 15W-40 is a high performance diesel engine oil that helps extend engine life in some of the most severe on and off highway applications. The advanced chemistry of these products delivers exceptional performance in both modern, high-output engines including those with Exhaust Gas Recirculation (EGR), as well as older engines operating on either low or high sulfur fuels. As a result, Mobil Delvac MX 15W-40 meets or exceeds the API CI-4 PLUS service category specifications.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Sulfated Ash, wt%, ASTM D 874	Total Base #, mg KOH/g, ASTM D 2896	Pour Point, °F (°C), ASTM D 97
	cSt at 40°C	cSt at 100°C				
Mobil Delvac MX F2 15W-40	123	15.6	133	1.3	12	-22 (-30)

Mobil Delvac™ Mobil Delvac™ 1600 Monogrades are high performance monograde diesel engine oils formulated from advanced technology base oils and a balanced additive system. They are recommended by ExxonMobil for use in intercooled, turbo-charged engines operating under severe on and off-highway conditions as well as a wide range of applications where a monograde lubricant is recommended.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Sulfated Ash, wt%, ASTM D 874	Total Base #, mg KOH/g, ASTM D 2896	Pour Point, °F (°C), ASTM D 97
	cSt at 40°C	cSt at 100°C				
Mobil Delvac 1630	90	11.5	117	1.4	12	-22 (-30)
Mobil Delvac 1640	132	14.7	112	1.4	12	-5.8 (-21)
Mobil Delvac 1650	202	19.5	110	1.4	12	-0.4 (-18)

Mobil Delvac™ Mobil Delvac™ 1200 Series are heavy duty, diesel engine oils formulated from high performance base oils and a balanced additive system of ashless dispersants, metallic detergents, and inhibitors to control oxidation, wear, corrosion, and rust. They are used in a wide range of applications where a monograde lubricant is recommended including 2-cycle diesel applications.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Sulfated Ash, wt%, ASTM D 874	Total Base #, mg KOH/g, ASTM D 2896	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C					
Mobil Delvac 1220	66	8.3	111	0.9	7.0	-16.6 (-27)	442.4 (228)
Mobil Delvac 1230	105	11.9	102	0.8	7.0	-16.6 (-27)	460.4 (238)
Mobil Delvac 1240	158	15.5	99	0.8	7.1	-5.8 (-21)	476.6 (247)
Mobil Delvac 1250	216	19.6	99	0.8	7.1	-5.8 (-21)	465.8 (241)

Mobil DIOL™ 9 RD Series oils are premium heavy-duty crankcase lubricants for locomotive diesel engines. These products are designed to meet the severe service demands imposed by the latest railroad diesel locomotive engines. An Electro-Motive Diesel (EMD) and General Electric (GE) endorsed additive system provides excellent engine protection, oil consumption control and oil drain interval extension capability.

Product	Viscosity, ASTM D 445		Viscosity Index	Pour Point, °F (°C)
	cSt at 40°C	cSt at 100°C		
Mobil Diol 9 RD 40	141	14.7	104	-6 (-21)
Mobil Diol 9 RD 20W-40	135	15.3	118	-6 (-21)

Mobil DIOL™ 11 RD Series oils are premium heavy-duty crankcase lubricants for locomotive diesel engines. These products were developed to meet the stringent performance requirements of Tier 4 locomotives. Older locomotive engines will also benefit from using the DIOL 11 RD series. An Electro-Motive Diesel (EMD) and General Electric (GE) endorsed additive system provides excellent engine protection, enhanced oxidation performance, improved oil consumption control, and enhanced Alkalinity / TBN retention, and oil drain interval extension capability compared to Mobil DIOL 9 RD series.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Total Base #, mg KOH/g, ASTM D 2896	Pour Point, °F (°C), ASTM D 97
	cSt at 40°C	cSt at 100°C			
Mobil Diol 11 RD 40	148	14.8	99	11	-27.4 (-33)
Mobil Diol 11 RD 20W-40	129	15.8	129	11	-22 (-30)

Mobil Delvac 1™ Mobil Delvac 1™ Transmission Fluid 50 is a synthetic, manual transmission lubricant engineered to meet extended drain and OEM warranty requirements. It provides year-round lubrication of manual transmissions in light to severe duty on- and off-highway equipment operating in a wide range of environments. Designed to provide maximum protection and extended operating life to heavy duty transmissions, Mobil Delvac 1 Transmission Fluid 50 provides significant advantages over conventional sulphur-phosphorus gear oils, including outstanding high-temperature performance, oxidation stability, wear protection, and corrosion control.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C			
Mobil Delvac 1 Transmission Fluid 50	132	17.5	146	-49 (-45)	429.8 (221)

Mobil Delvac 1™ Mobil Delvac 1™ Transmission Fluid Arctic is a high performance, synthetic drivetrain lubricant engineered to meet the demanding requirements of major manufacturers of heavy-duty commercial equipment in extremely cold climate applications. It is recommended by ExxonMobil for use in truck and other commercial transmissions where Caterpillar TO-4 and Allison C-4 performance specifications are required. Mobil Delvac 1 Transmission Fluid Arctic provides outstanding clutch and brake compatibility and friction control along the widest temperature range performance.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C			
Mobil Delvac 1 Transmission Fluid Arctic	81	12.2	146	-59.8 (-51)	442.4 (228)

Mobil Delvac 1™ Mobil Delvac 1™ ATF is a synthetic fluid recommended by Allison Transmission, Inc. approved against the Allison TES-295 Specification. The fluid is designed to meet the demanding requirements of modern heavy duty automatic transmissions. The synthetic base oil composition enables excellent performance even in some of the harshest of operating conditions. It offers outstanding gear shifting and power transfer performance. Versus conventional ATF fluids, the inherently high viscosity index and stability of Mobil Delvac 1 ATF protects against thermal breakdown at high operating temperatures, while still providing outstanding performance at sub-zero temperatures.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C			
Mobil Delvac 1 ATF	39	7.3	168	-65.2 (-54)	456.8 (236)

Mobil Delvac 1™ Mobil Delvac 1™ Gear Oils are synthetic drivetrain lubricants engineered to meet extended drain and warranty requirements. These products are designed for use in heavy-duty drivetrains that require gear lubricants with relatively high viscosity and excellent load-carrying capability and where extreme pressures and shock loading are expected. Mobil Delvac 1 Gear Oil 75W-90 and 80W-140 incorporate the latest technology in synthetic basestocks and advanced additives providing significant advantages over mineral gear oils.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C			
Mobil Delvac 1 Gear 75W-90	120	15.9	140	-54.4 (-48)	401 (205)

Please refer to mobil.com/pds for latest product information

Return to the [Product Application Index](#)

Bumper-to-bumper recommendations for your truck

Clutch Throw-Out Bearings

Protect from Rust and Corrosion

Mobil Delvac™ Xtreme Grease
Mobil Centaur™ Moly

Fifth Wheel

Protect from Rust and Corrosion

Mobil Delvac™ Xtreme Grease
Mobil Centaur™ Moly

Engine

Extend Your Engine Life

Mobil Delvac 1™
Mobil Delvac™ Extreme
Mobil Delvac™ Extreme FE
Mobil Delvac™ 1300 Super
Mobil Delvac™ Super FE
Mobil Delvac™ ELC
(Extended Life Coolant)

Universal Joints

Protect from Rust and Corrosion

Mobil Delvac™ Xtreme Grease
Mobil Centaur™ Moly

Differential/Final Drive

Performance Under Pressure

Mobil Delvac 1™ Gear Oil

Transmission

Smooth-Running Transmission

Mobil Delvac 1™ Transmission Fluid 50
Mobil Delvac 1™ ATF

Manual Steering Gear

Leak No More

Mobilith SHC™ 007
Mobil ATF™ D/M

Greasing Points: Tie-Rod Ends, Spring Pin Bushings, King Pins, and Chassis

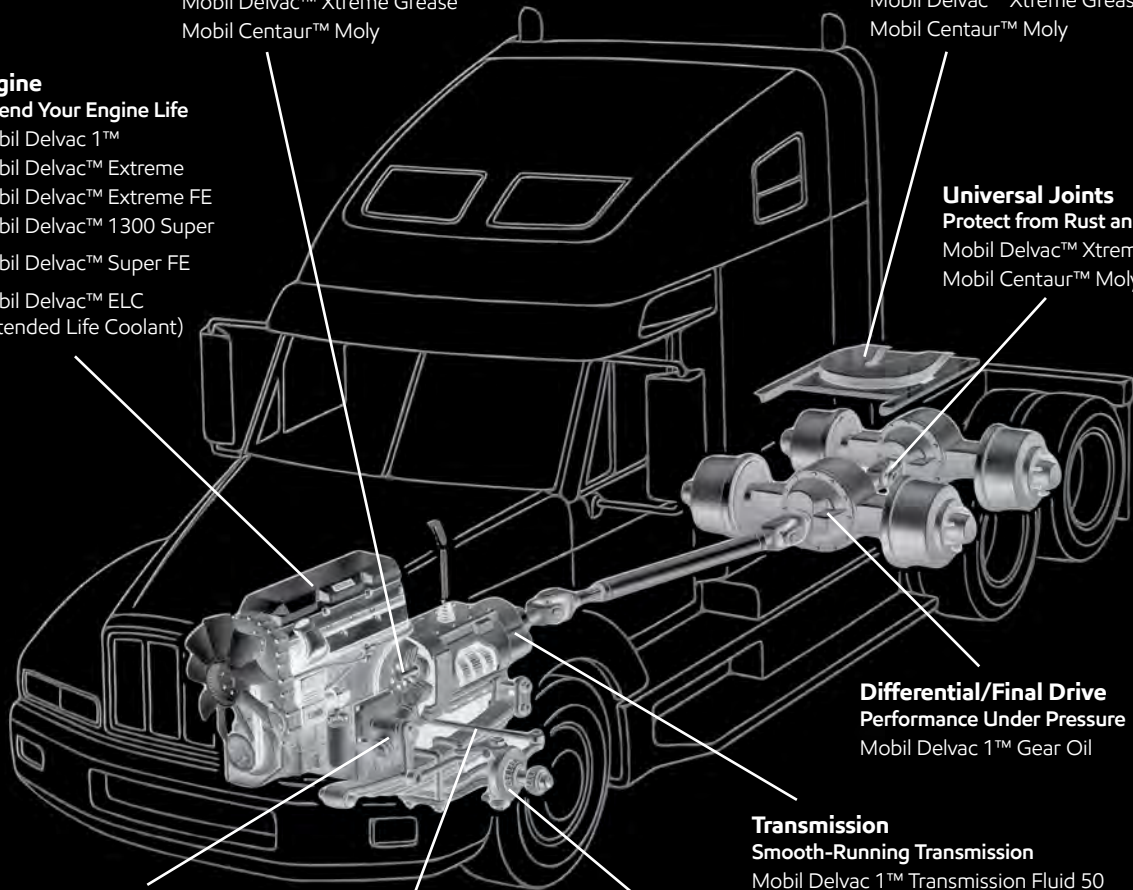
High-Performing Protection

Mobil Delvac™ Xtreme Grease
Mobil Centaur™ Moly

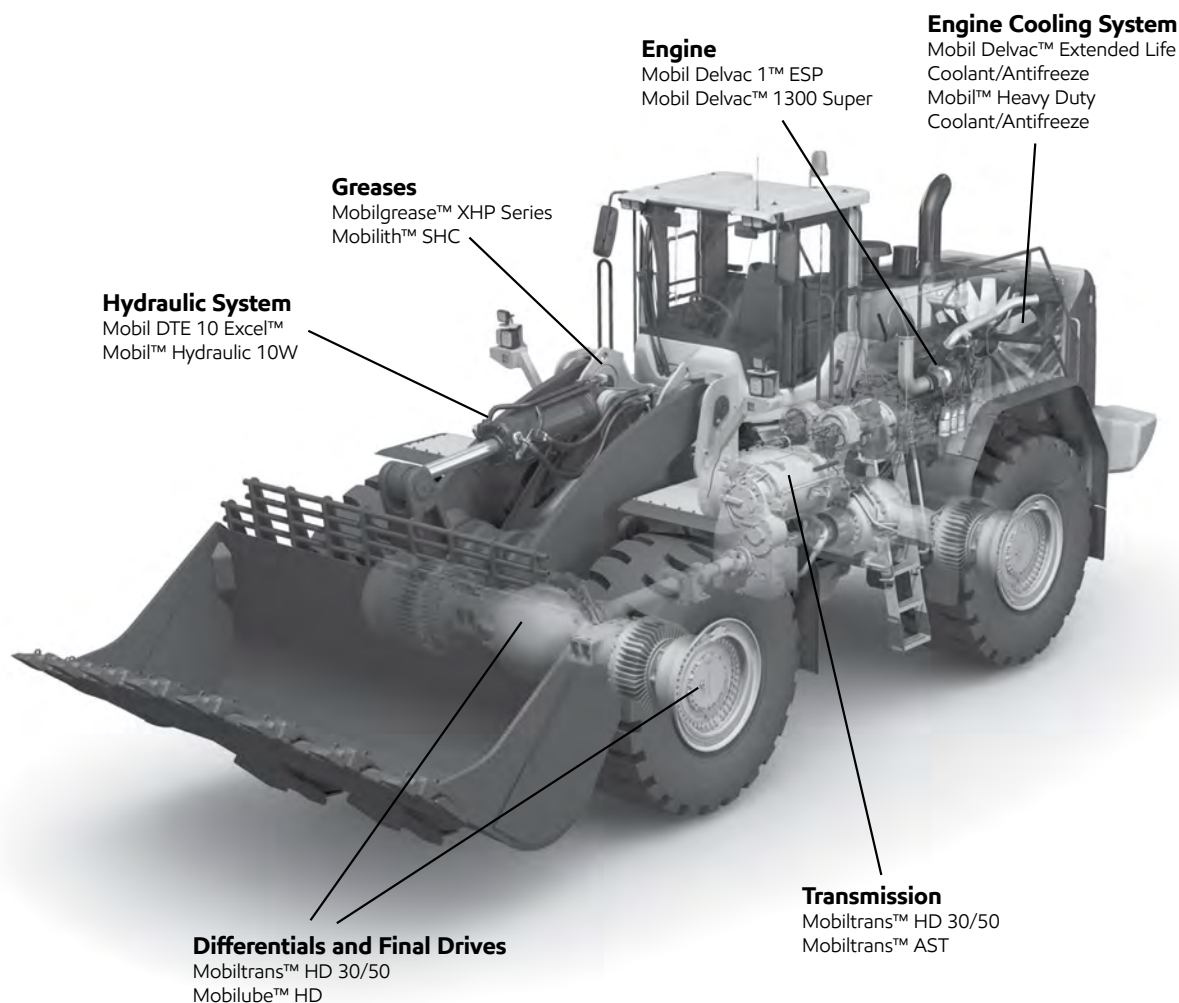
Steer Axle Wheel Bearings

Leak No More

Mobil Delvac 1™ Gear Oil
Mobil Delvac 1™ Transmission Fluid 50
Mobilith SHC™ 007



Bumper-to-bumper applications for your business*



* This is a general illustration to identify some of the key components and applications; the list of products is not intended as a specific recommendation for any particular OEM model. Off-highway applications are different from model to model and OEM to OEM. For specific OEM model recommendations, please contact your ExxonMobil engineer.

COMMERCIAL VEHICLE LUBRICANTS

HEAVY DUTY POWER TRANSMISSION FLUIDS

Mobil Delvac 1 Gear 80W-140	310	31.2	139	-32.8 (-36)	410 (210)
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Mobil™ Hydraulic 10W is a high performance hydraulic oil formulated from advanced base oils and a balanced additive system designed to satisfy a wide range of heavy-duty hydraulic equipment requirements. This product is specifically engineered using an effective balance of ashless dispersants and metallic detergents combined with inhibitors to control oxidation, wear, corrosion and rust. Mobil Hydraulic 10W is used in a wide range of on and off-highway hydraulic applications.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C			
Mobil Hydraulic 10W	37.7	6.1	107	-22 (-30)	449.6 (232)

Mobilfluid™ 424 is a high performance multipurpose tractor lubricant engineered to meet or exceed transmission and hydraulic fluid requirements. The advanced technology in Mobilfluid 424 is designed to optimise the performance of agricultural and commercial tractors operating in a wide range of environments and conditions. Mobilfluid 424 combines select base oils and an advanced additive package to deliver the varied lubricant performance properties required in severe duty applications of agricultural and construction equipment drive trains. It is particularly well suited for reducing wet brake and Power Take-Off (PTO) chatter.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C			
Mobilfluid 424	55	9.3	145	-43.6 (-42)	388.4 (198)

Mobilfluid™ LT is a high performance multipurpose tractor lubricant engineered to meet or exceed tractor transmission, drivetrain, and hydraulic fluid requirements. This product is designed to optimize the performance of agricultural and industrial tractors operating in a wide range of environments and especially in low ambient temperature applications. This next generation product combines select base oils and an advanced additive package to deliver a variety of lubricant performance properties required by various applications.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C			
Mobilfluid LT	34	7.2	180	-49 (-45)	388.4 (198)

Mobilube™ HD 80W-140 is a heavy-duty gear lubricant formulated from high performance base oils and an advanced additive system. This lubricant is engineered for commercial axles and final drives where extreme pressures and shock loading are expected. It provides excellent performance where API GL-5 service is required.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C			
Mobilube HD 80W-140	260	26.6	133	-27.4 (-33)	352.4 (178)

Mobilube™ HD 80W-90 is a high performance, heavy duty gear lubricant formulated from high performance base oils and an advanced additive system. This lubricant is engineered for automotive applications including heavy duty axles and final drives where extreme pressures and shock loading are expected. This is recommended by ExxonMobil for applications where API GL-5 service is required.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C			
Mobilube HD 80W-90	136	14.5	105	-22 (-30)	395.6 (202)

Mobilube™ HD Plus 80W-90 and 85W-140 are extra high performance commercial gear lubricants formulated from select base oils and an advanced additive system. These lubricants are engineered for performance in heavy-duty commercial transmissions, axles, and final drives where extreme pressures and shock loading are expected. They provide excellent chemical and thermal stability at elevated bulk oil temperatures, good performance at low temperatures, and have demonstrated good rust protection resulting from water contamination and wet conditions. They are recommended by ExxonMobil for applications where API GL-5 and MT-1 service is required. Mobilube HD Plus 80W-90 and 85W-140 share common formulations with Esso Gear Oil GX 80W-90 and 85W-140.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C			
Mobilube HD Plus 80W-90	139	14.5	103	-16.6 (-27)	410 (210)
Mobilube HD Plus 85W-140	333	25.4	99	-0.4 (-18)	446 (230)

Mobilube™ XFD 50 and 60 are extra high performance drivetrain lubricants engineered specifically to provide optimum component life when used as recommended in Caterpillar final drives and axles. They are formulated from advanced base oils and the latest additive technology to protect bearings and gears from premature failure due to fatigue. These lubricants deliver excellent performance in heavy-duty commercial axles and final drives where extreme pressures and shock loading are expected. They provide exceptional chemical and thermal stability at elevated bulk oil temperatures generated under heavy loads and/or high ambient temperatures.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C			
Mobilube XFD 50	206	18.4	97	-11.2 (-24)	482 (250)
Mobilube XFD 60	334	25.2	97	5 (-15)	491 (255)

Mobiltrans™ AST (All Season Transmission) is an extra high performance drivetrain lubricant engineered to meet or exceed the requirements of Caterpillar's TO-4M performance specifications for off-highway transmissions, drive trains, and hydraulic systems. This advanced technology lubricant provides clutch and brake compatibility and extended life that has not been possible with previous formulations. Mobiltrans AST incorporates a blend of semi-synthetic base oils with an advanced additive system. The product provides all-season lubrication of all drivetrain components in light to severe duty off-highway equipment operating in a wide range of environments.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C			
Mobiltrans AST	107	14.2	134	-38.2 (-39)	431.6 (222)

Mobil SHC™ Mobil SHC™ Gear OH Series lubricants are extra high performance heavy-duty gear oils primarily designed to lubricate enclosed gearing as well as plain and rolling element bearings in off-highway equipment subject to shock and heavy loading. They are designed to provide outstanding service in terms of equipment protection, oil life, and problem-free operation helping to enable increased customer productivity. These scientifically engineered synthetic lubricants are formulated from synthetic base fluids that have exceptional oxidation and thermal properties and excellent low temperature fluidity. The combination of a naturally high viscosity index and a unique additive system enables these products to provide outstanding performance under severe high and low temperature operating conditions. The nature of the synthetic base fluids also contributes to the products' excellent low temperature performance. They deliver outstanding gear scuffing protection in heavily loaded gearboxes.

Product	ISO VG	Kinematic Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 5950	Flash Point, °F (°C), ASTM D 92	FZG Gear Scuffing, (A/8.3/90), ISO 14635-1 mod Failure Stage
		cSt at 40°C	cSt at 100°C				
Mobil SHC Gear OH 320	320	320	40.1	178	-49 (-45)	451.4 (233)	>13
Mobil SHC Gear OH 460	460	460	54.9	186	-43.6 (-42)	451.4 (233)	>13
Mobil SHC Gear OH 680	680	680	76.1	193	-38.2 (-39)	451.4 (233)	>13

COMMERCIAL VEHICLE LUBRICANTS

HEAVY DUTY POWER TRANSMISSION FLUIDS

Mobiltrans™ HD 10W, 30, 50, and 60 are extra high performance, heavy duty transmission and drive-train lubricants engineered to meet or exceed the requirements of the rigorous Caterpillar TO-4 specification. This product line is uniquely designed to optimise the performance of powershift transmissions, gearboxes, and final drives. In hydraulic applications, they provide maximum protection even in high pressure systems.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C			
Mobiltrans HD 10W	42	6.3	96	-27.4 (-33)	395.6 (202)
Mobiltrans HD 30	100	11.2	97	-0.4 (-18)	435.2 (224)
Mobiltrans HD 50	195	18.0	100	5 (-15)	464 (240)
Mobiltrans HD 60	340	25.2	96	10.4 (-12)	471.2 (244)

Mobil™ Hydraulic 10W	58
Mobil DTE 10 Excel™ Series	34

COMMERCIAL VEHICLE LUBRICANTS

TRACTOR HYDRAULIC FLUIDS

Mobilfluid™ 424	61
Mobilfluid™ LT	61

Coolant/Antifreeze Selector

All coolants are available in concentrate or 50/50 pre-diluted.

Extended Life Coolant (ELC): Mobil™ Delvac Extended Life

- Color: Red
- Highest performance, longest lasting, simplest/cheapest maintenance, lowest cost to use heavy duty coolant from ExxonMobil
- Unique nitrite-free Organic Acid Technology – no nitrite test strips needed
- No drop-out concerns - No Supplemental Coolant Additives (SCAs/nitrites) needed



Fully Formulated: Mobil™ Heavy-Duty SCA Precharged

- Color: Fushia/Pink
- SCA Pre-Charged For Heavy-Duty wet sleeve liner Applications
- Reduced additive drop-out concern – low dissolved solids



Conventional Automotive: Mobil Permazone™

- Color: Green
- Conventional coolants not recommended by OEMs any more
- Requires SCAs if used in Heavy-Duty Applications



Mobil Delvac™ Extended Life Coolant/Antifreeze is a globally formulated coolant which uses proprietary organic corrosion inhibitors, provides outstanding wet sleeve liner cavitation and provides corrosion protection for all cooling system metals. In severe service testing, Mobil Delvac Extended Life Coolant/Antifreeze achieved a service interval equivalent to 1 million miles of on-road use (8 years or 20,000 hours of off-highway use) without the use of supplemental coolant additives (SCAs). Available in concentrate and 50/50 prediluted versions. Color: RED.

Mobil™ Heavy Duty SCA Precharged Coolant/Antifreeze is a diesel specific coolant, formulated to provide exceptional engine protection for all heavy-duty cooling systems. It provides optimum protection against freezing, overheating, cavitation, erosion, corrosion and scale for all heavy-duty cooling system applications. Because it is precharged with a Supplemental Coolant Additive (SCA), Mobil Heavy Duty Coolant/Antifreeze requires no SCAs at initial fill and ensures proper chemistry at every top-off. Available in concentrate and 50/50 prediluted versions. Color: FUSHIA/PINK.

Mobil Permazone™ Coolant/Antifreeze is a conventional antifreeze™ containing inhibitors providing protection from freezing, overheating, rust and corrosion when used as recommended. Mobil Permazone Antifreeze and Coolant features a low silicate formula and protects all cooling system metal surfaces, including aluminum. Available in concentrate and 50/50 prediluted versions. Color: GREEN.

PASSENGER VEHICLE LUBRICANTS

PASSENGER VEHICLE ENGINE OILS

Choose the best protection for your vehicle.



Mobil Super™

Mobil Super™
High MileageMobil Super™
Synthetic

Mobil 1™

Mobil 1™
High MileageMobil 1™
Advanced Fuel
EconomyMobil 1™
Extended
Performance

Formulations that help:	Premium Conventional	Synthetic Blend	Full Synthetic	Advanced Full Synthetic	Advanced Full Synthetic	Advanced Full Synthetic	Advanced Full Synthetic
Prevent breakdown and extend engine life	★	★	★	★★	★★	★★	★★
Protect against wear	★	★	★	★★	★★	★★	★★
Combat sludge and deposits	★	★	★	★★	★★	★★	★★
Control oil consumption and loss		★	★★	★★	★★★	★★	★★
Protect in high engine temperatures			★★	★★	★★★	★★★	★★★
Prevent oil leaks and protect older engines		✓			✓		
Improve fuel economy*						✓	
Protect during 15,000-mile oil changes—guaranteed**							✓

★ The number of stars indicates relative performance. Testing on 5W-30 and 0W-30 viscosities.

* Based on 0.2-2.3% potential fuel economy improvement obtained by switching from higher viscosity oils to a 0W-20 or 0W-30 grade. Actual savings are dependent upon vehicle/engine type, outside temperature, driving conditions and your current engine oil viscosity.

** Some restrictions apply. For more details, see the Mobil 1 Extended Performance Limited Warranty, available at mobil1.us/guarantee.

Mobil 1 Extended Performance 5W-20 and 5W-30, Mobil 1 Advanced Fuel Economy 0W-20 and 0W-30, Mobil 1 5W-20 and 5W-30, and Mobil Super Synthetic 5W-30 motor oils are officially licensed General Motors dexos1™ products.

PASSENGER VEHICLE PRODUCT LISTING BY APPLICATION

INDUSTRIAL

COMMERCIAL

PASSENGER

MARINE

AVIATION

GREASES

PASSENGER VEHICLE LUBRICANTS	PRODUCT	PAGE
PASSENGER VEHICLE ENGINE OILS	Passenger Vehicle Engine Oil Selector Chart.....	65
	Mobil 1™.....	67
	Mobil 1™ Advanced Fuel Economy.....	67
	Mobil 1™ ESP X1 0W-30.....	68
	Mobil 1™ ESP Formula 5W-30.....	68
	Mobil 1™ Extended Performance.....	68
	Mobil 1™ High Mileage Oils.....	68
	Mobil 1™ Turbo Diesel Truck 5W-40.....	68
	Mobil Super™.....	69
	Mobil Super™ High Mileage.....	69
	Mobil Super™ Synthetic.....	69
	Mobil Special™.....	69
	Mobil 1 Racing™.....	69
PASSENGER VEHICLE DRIVE TRAIN FLUIDS	Mobil 1™ Synthetic ATF.....	70
	Mobil™ Dexron®-VI ATF.....	70
	Mobil™ Multi-Vehicle ATF.....	70
	Mobil ATF™ D/M.....	70
	Mobil ATF™ Type F.....	70
	Mobil 1™ Synthetic Gear Lubricant LS.....	70
	Mobilube™ HD Plus 80W-90 and 85W-40.....	61
	Mobilube™ HD LS 80W-90.....	61
	Mobilube™ HD 80W-140.....	61
MOTORCYCLE OILS	Mobil 1™.....	71
PASSENGER VEHICLE INSTALLER GREASES	Mobil 1™ Synthetic Grease.....	95
	Mobilgrease™ XHP 222.....	90
	Mobil Ronex™ MP.....	95

PASSENGER VEHICLE LUBRICANTS

PASSENGER VEHICLE ENGINE OILS

Mobil 1™ Mobil 1™ FS 0W-40 is an advanced performance synthetic engine oil designed to help provide exceptional cleaning power, wear protection and overall performance. Mobil 1 FS 0W-40, meets or exceeds the requirements of leading industry and car manufacturers' standards required for newer modern gasoline and diesel powered automobile engines. Mobil 1 FS 0W-40 is excellent for all types of vehicles and has the performance reserve to protect when conventional engine oils may not. Mobil 1 lubricants come as standard equipment in many different performance vehicles.

Mobil 1™ Mobil 1™ 5W-20 and 5W-30 are advanced synthetic engine oils designed to keep your engine running like new by providing exceptional wear protection, cleaning power and overall performance. Mobil 1 5W-20 and 5W-30 meets or exceeds the requirements of the industry's toughest standards and outperforms conventional oils. Mobil 1 lubricants come as standard equipment in many different vehicles, including select high-performance vehicles.

Mobil 1™ Mobil 1™ FS X2 5W-50 is an advanced synthetic engine oil designed to help provide exceptional wear protection for a smooth driving experience every time. Mobil 1 FS X2 5W-50 meets or exceeds the requirements of the industry and car manufacturers' standards required for high-performance turbo-charged, supercharged gasoline and diesel multi-valve fuel injected engines. Mobil 1 FS X2 5W-50 is especially suited for high speed and severe service associated with stop and go driving. Racing or normal driving, Mobil 1 FS X2 5W-50, helps to provide heavy-duty engine performance and protection for an outstanding driving experience.

Mobil 1™ Mobil 1™ 10W-30 is an advanced synthetic engine oil designed to keep engines running like new by providing exceptional cleaning power, wear protection and overall performance. Mobil 1 10W-30 meets or exceeds the requirements of the latest industry standards required by modern gasoline engines. Mobil 1 lubricants come as standard equipment in many different vehicles, including select high-performance vehicles.

Mobil 1™ Mobil 1™ 15W-50 is an advanced synthetic engine oil designed to help provide exceptional wear protection for a smooth driving experience. Mobil 1 15W-50 meets or exceeds the requirements of the industry and car manufacturers' standards required for high-performance turbo-charged, supercharged gasoline and diesel multi-valve fuel injected engines. Mobil 1 15W-50 is a winning, race-proven technology. It is especially suited for a wide variety of motorsports applications, towing, and other severe service situations. Mobil 1 15W-50 helps to provide outstanding engine oil performance and protection for the winning edge.

Product	Viscosity, ASTM D 445		V.I.	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C			
Mobil 1 FS 0W-40	75	13.5	185	–	446 (230)
Mobil 1 5W-20	49.8	8.9	160	-45.4 (-43)	446 (230)
Mobil 1 5W-30	61.7	11.0	172	-43.6 (-42)	446 (230)
Mobil 1 FS X2 5W-50	108	17.5	180	–	447.8 (231)
Mobil 1 10W-30	63.2	10.1	146	-43.6 (-42)	449.6 (232)
Mobil 1 15W-50	125	18	160	-38.2 (-39)	449.6 (232)

Mobil 1™ Mobil 1™ 0W-20 and 0W-30 Advanced Fuel Economy are advanced synthetic engine oils designed to help deliver outstanding engine protection and improved fuel economy. Mobil 1 0W-20 Advanced Fuel Economy meets or exceeds the requirements of the latest industry standards and outperforms our conventional oils. Mobil 1 0W-20 Advanced Fuel Economy is recommended by ExxonMobil for SAE 0W-20 and 5W-20 applications. Mobil 1 0W-30 Advanced Fuel Economy is recommended by ExxonMobil for SAE 0W-30, 5W-30 and 10W-30 applications.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C			
Mobil 1 0W-20 Advanced Fuel Economy	44.8	8.7	173	–	435.2 (224)
Mobil 1 0W-30 Advanced Fuel Economy	62.9	10.9	166	-58 (-50)	438.8 (226)

Mobil 1™ Mobil 1™ ESP X1 0W-30 and **Mobil 1™ Mobil 1™ ESP Formula 5W-30** are advanced performance synthetic engine oils designed to help provide exceptional cleaning power, wear protection and overall performance. Mobil 1 ESP X1 0W-30 and Mobil 1 ESP Formula 5W-30 have been expertly engineered to help prolong the life and maintain the efficiency of emission systems in both diesel and gasoline powered automobiles. Mobil 1 ESP X1 0W-30 and Mobil 1 ESP Formula 5W-30 meets or exceeds the requirements of many leading industry and car manufacturers' standards required for newer modern diesel and gasoline powered passenger car engines.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C			
Mobil 1 ESP X1 0W-30	—	12.2	166	-59.8 (-51)	446 (230)
Mobil 1 ESP Formula 5W-30	72.8	12.1	164	-49 (-45)	489.2 (254)

Mobil 1™ Mobil 1™ Extended Performance are advanced synthetic engine oils designed to keep your engines running like new and protect critical engine parts for 15,000 miles between oil changes. Mobil 1 Extended Performance features a special formulation that helps to provide outstanding protection during today's longer oil change intervals.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C			
Mobil 1 Extended Performance 0W-20	—	8.6	173	-65.2 (-54)	455 (235)
Mobil 1 Extended Performance 5W-20	49.6	8.9	161	-43.6 (-42)	446 (230)
Mobil 1 Extended Performance 5W-30	59.8	10.6	169	-40 (-40)	446 (230)
Mobil 1 Extended Performance 10W-30	63.7	10.2	147	-38.2 (-39)	449.6 (232)

Mobil 1™ Mobil 1™ High Mileage Oils are designed to help maximize engine performance and extend the engine life of vehicles with over 75,000 miles.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C			
Mobil 1 High Mileage 0W-20	—	9	172	-54.4 (-48)	456.8 (236)
Mobil 1 High Mileage 5W-20	50.1	8.6	150	-43.6 (-42)	471.2 (244)
Mobil 1 High Mileage 5W-30	69.2	12.1	165	-38.2 (-39)	446 (230)
Mobil 1 High Mileage 10W-30	78.1	12	149	-38.2 (-39)	449.6 (232)
Mobil 1 High Mileage 10W-40	95.9	16	160	-43.6 (-42)	449.6 (232)

Mobil 1™ Mobil 1™ Turbo Diesel Truck 5W-40 Mobil 1 Turbo Diesel Truck 5W-40 is a synthetic performance heavy duty diesel engine oil that helps to extend engine life while providing long drain capability and fuel economy for modern diesel engines operating in severe applications. Mobil 1 Turbo Diesel Truck utilizes state-of-the-art technology to help deliver exceptional performance in modern low emission engines, including refrigerated units, as well as older, well-maintained engines.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C			
Mobil 1 High Mileage 10W-40	97.9	13.6	170	-27.4 (-33)	431.6 (222)

PASSENGER VEHICLE LUBRICANTS

PASSENGER VEHICLE ENGINE OILS

Mobil Super™ Mobil Super™ is formulated from high quality base oils combined with modern performance additives to help provide long engine life and protect critical engine parts from lubricant related failures for up to 5,000 miles or your vehicle's OEM recommended oil change interval, whichever is longer.*

Product	Viscosity		V.I.	Pour Point, °F (°C)	Flash Point, °F (°C), ASTM D 92	Spec. Gravity
	cSt at 40°C	cSt at 100°C				
Mobil Super 5W-20	47.9	8.4	152	-32.8 (-36)	446 (230)	0.8604
Mobil Super 5W-30	63.95	10.7	158	-32.8 (-36)	429.8 (221)	0.8607
Mobil Super 10W-30	68.8	10.5	140	-32.8 (-36)	446 (230)	0.8693
Mobil Super 10W-40	105.8	15.2	152	-27.4 (-33)	464 (240)	0.8681

* Some limitations apply. For more specific details see the Mobil Super Limited Warranty available at www.mobil.com/guarantee.

Mobil Super™ Mobil Super™ High Mileage uses a combination of synthetic and conventional high quality base oils combined with modern performance additives to help provide long engine life and outstanding protection for vehicles with more than 75,000 miles. Formulated with seal conditioner, Mobil Super High Mileage helps prevent leaks and reduce oil consumption.

Product	Viscosity		V.I.	Pour Point, °F (°C)	Flash Point, °F (°C), ASTM D 92	Spec. Gravity
	cSt at 40°C	cSt at 100°C				
Mobil Super High Mileage 5W-20	46.9	8.3	153	-32.8 (-36)	424.4 (218)	0.8590
Mobil Super High Mileage 5W-30	61.4	10.4	159	-32.8 (-36)	431.6 (222)	0.8590
Mobil Super High Mileage 10W-30	66.3	10.4	145	-32.8 (-36)	428 (220)	0.8667
Mobil Super High Mileage 10W-40	103	14.7	148	-38.2 (-39)	440.6 (227)	0.877

Mobil Super™ Mobil Super™ Synthetic is a synthetic high-performance motor oil, which provides excellent high temperature protection even under severe operating conditions.

Product	Viscosity		V.I.	Pour Point, °F (°C)	Flash Point, °F (°C), ASTM D 92	Spec. Gravity
	cSt at 40°C	cSt at 100°C				
Mobil Super Synthetic 0W-20	44.9	8.6	173	-32.8 (-42)	460.4 (238)	0.848
Mobil Super Synthetic 5W-20	49.6	8.8	158	-38.2 (-39)	453.2 (234)	0.850
Mobil Super Synthetic 5W-30	61.1	10.5	162	-38.2 (-39)	413.6 (212)	0.852
Mobil Super Synthetic 10W-30	64.4	10.5	152	-38.2 (-39)	485.6 (252)	0.855

Mobil Special™ motor oil is formulated from quality base stocks combined with modern performance additives to give your engine the protection and the performance you expect under a wide variety of operating conditions.

Product	Viscosity, ASTM D 445		V.I.	Pour Point, °F (°C)	Flash Point, °F (°C), ASTM D 92	Spec. Gravity
	cSt at 40°C	cSt at 100°C				
Mobil Special 5W-20	49.2	8.6	153	-27.4 (-33)	464 (224)	0.8596
Mobil Special 5W-30*	60.42	10.2	157	-27.4 (-33)	464 (220)	0.8600
Mobil Special 10W-30*	69.4	10.6	141	-16.6 (-27)	464 (220)	0.8692
Mobil Special 10W-40	107	15.4	152	-16.6 (-27)	464 (224)	0.870
Mobil Special 20W-50	154	19.0	140	-0.4 (-27)	464 (230)	0.88

* In order to meet corporate global product naming conventions, the product names for the SAE viscosities 5W-30 and 10W-30 only, will carry the X1 descriptor in the labels, SDS and ExxonMobil systems: (e.g.: Mobil Special X1 5W-30 and Mobil Special X1 10W-30). For the rest of the viscosity grades, the product name will remain Mobil Special (e.g.: Mobil Special 5W-20, Mobil Special 10W-40, Mobil Special 25W-50).

Mobil 1™ Mobil 1 Racing™ 0W-30 and 0W-50 oils were developed specifically for racing engines and are not recommended for street use. These high performance, synthetic formulas are specially balanced for friction reduction and optimum horsepower with outstanding wear protection.

Product	Viscosity, ASTM D 445		V.I.	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C			
Mobil 1 Racing 0W-30	63.5	11	178	-65.2 (-54)	422.6 (217)
Mobil 1 Racing 0W-50	100	17.2	189	-65.2 (-54)	429.8 (221)

Mobil 1™ Synthetic ATF is a multi-vehicle, synthetic fluid designed to meet the demanding requirements of modern passenger vehicles.

Product	Viscosity, ASTM D 445		V.I.	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C			
Mobil 1 Synthetic ATF	36.3	7.4	176	-59.8 (-51)	428 (220)

Mobil™ Dexron®-VI ATF is a high performance, synthetic blend ATF formulation that meets or exceeds the stringent requirements of GM's DEXRON-VI specification and provides warranty protection for 2006 and newer GM vehicles. It also provides improved performance in older GM vehicles, wherever DEXRON is specified.

Product	Viscosity		V.I.	Flash Point, °F (°C)
	cSt at 40°C	cSt at 100°C		
Mobil Dexron-VI ATF	29.5	5.83	145	428 (220)

Mobil™ Multi-Vehicle ATF is a premium synthetic blend lubricant formulated for use in a wide variety of North American, European, and Asian vehicles.

Product	Viscosity		V.I.	Flash Point, °F (°C)
	cSt at 40°C	cSt at 100°C		
Mobil Multi-Vehicle ATF	34.1	7.42	193	356 (180)

Mobil™ ATF D/M provides excellent oxidation and friction stability, anti-wear properties, and low-temperature fluidity desired for most automatic transmissions.

Product	Viscosity, ASTM D 445		V.I.	Flash Point, °F (°C)
	cSt at 40°C	cSt at 100°C		
Mobil ATF D/M	35.3	7.4	183	672.8 (356)

Mobil™ ATF Type F is an automatic transmission fluid which is made from high quality base oils with viscosity index improvers, antioxidants, anti-wear agents, defoamants and special additives to provide the controlled frictional characteristics of a Type F fluid in automatic transmission applications.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C			
Mobil ATF Type F	36.0	7.2	150	-40 (-40)	320 (160)

Mobil 1™ Synthetic Gear Lubricant LS is a high performance, synthetic, multi-purpose, automotive gear lubricant designed to help meet the highest level performance requirements of modern passenger vehicles in many types of operating conditions including limited slip applications, as well as, deliver outstanding power transfer performance.

Product	Viscosity, ASTM D 445		V.I.	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C			
Mobil 1 Synthetic Gear Lubricant LS 75W-90	99	15.2	142	-38.2 (-39)	302 (150)
Mobil 1 Synthetic Gear Lubricant LS 75W-140	170	24.4	175	-54.4 (-48)	404.6 (207)

Mobilube™ HD Plus 80W-90 and 85W-140 61

Mobilube™ HD 80W-90 61

Mobilube™ HD LS 80W-140 61

PASSENGER VEHICLE LUBRICANTS

MOTORCYCLE OILS

Mobil 1™ Mobil 1™ oils are advanced performance synthetic motorcycle oils. The unique, synthetic structure of the Mobil 1 formulations enable them to offer advantages beyond our conventional motorcycle oils of similar viscosities. For example, base oils become lighter in viscosity as temperature increase. This characteristic forces manufacturers of oils to use thickeners which will help the oil maintain its viscosity as the temperature increase. These thickeners, however, can shear down and lose their thickening capacity in an operating engine or transmission. Synthetic fluids do not require as much thickener to achieve a multigrade viscosity rating and, in some cases, do not require any thickener. As a result, synthetic formulations tend to be very shear stable and thus, provide a solid, protective oil film for engine bearings, piston rings, transmission gears and other critical engine parts.

Product	Viscosity, ASTM D 445		V.I.	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C			
Mobil 1 Racing 4T 10W-40	82.0	14	154	-38.2 (-39)	453.2 (234)
Mobil 1 Racing V-Twin 20W-50	172.3	20.8	142	-43.6 (-42)	417.2 (214)

PASSENGER VEHICLE LUBRICANTS

PASSENGER VEHICLE INSTALLER GREASES

Mobil 1™ Mobil 1™ Synthetic Grease.....	95
Mobilgrease™ XHP 222.....	90
Mobil Ronex™ MP.....	95

Mobilgard™

MARINE LUBRICANTS	PRODUCT	PAGE
CROSSHEAD ENGINE OILS	Mobilgard™ 560 VS.....	73
	Mobilgard™ 300.....	73
TRUNK PISTON ENGINE OILS	Mobilgard™ ADL Series.....	74
	Mobilgard™ 12 Series.....	74
	Mobilgard™ 409 NC.....	74
	Mobilgard™ M30 Series.....	74
	Mobilgard™ M40 Series (M440).....	75
	Mobilgard™ M50.....	75
THRUSTER GEAR OIL – SYNTHETIC	Mobilgear SHC™ MT 68.....	76

MARINE LUBRICANTS

CROSSHEAD ENGINE OILS

Mobilgard™ Mobilgard™ 560 VS is a high performance, marine diesel engine cylinder oil that is for use in crosshead engines running heavy fuel with sulfur levels from 0.5-4.0%. This new cylinder lubricant technology provides superb protection from adhesive and corrosive wear at the higher operating temperatures and pressures found in today's modern crosshead engines. The outstanding performance of Mobilgard 560 VS has been demonstrated at the highest peak firing pressures and liner temperatures.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Spec. Gravity at 15° C	TBN, mg KOH/g, ASTM D 2896
	cSt at 40°C	cSt at 100°C					
Mobilgard 560 VS	222	20	104	15.8 (-9)	492.8 (256)	0.937	60

Mobilgard™ Mobilgard™ 300 is a premium quality, extra high performance system oil designed for crosshead diesel engines. High quality paraffinic base oils along with a balanced additive system provide excellent protection even for the severe operating conditions of the latest design, high-output crosshead marine diesel engines. This product has sufficient alkalinity to neutralise strong acids which may find their way into the crankcase from the combustion of fuel sulphur, and it has enhanced load carrying ability in order to help reduce wear in heavily loaded bearings.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Spec. Gravity at 15° C
	cSt at 100°C					
Mobilgard 300	12		97	10.4 (-12)	510.8 (266)	0.889

Mobilgard™ Mobilgard™ ADL Series is a high performance family of increased dispersancy engine oils for high BMEP medium and high-speed diesel engines operating on distillate and MDO fuels. These advanced diesel lubricants are available in both SAE 30 and 40 grades to suit most marine engine viscosity requirements. As a result of a special balance of detergent and dispersant properties these oils provide not only increased resistance to cylinder liner lacquer formation in severe service applications, but also assist in sludge and deposit removal. Use of Mobilgard ADL Series oils avoids high oil consumption associated with cylinder liner lacquering, improves overall engine cleanliness and can increase time between engine overhauls. Excellent load carrying properties minimize piston ring and liner wear, and also make Mobilgard ADL Series lubricants suitable for marine gearing applications.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point,	Flash Point,	Spec. Gravity at 15° C	TBN
	cSt at 100°C			°F (°C), ASTM D 97	°F (°C), ASTM D 92		mg KOH/g, ASTM D 2896
Mobilgard ADL 30	11.5		117	-22 (-30)	446 (230)	0.889	12
Mobilgard ADL 40	14.7		112	-5.8 (-21)	462.2 (239)	0.892	12

Mobilgard™ Mobilgard™ 12 Series oils are high performance diesel engine oils developed for use in trunk piston engines operating on low sulphur distillate fuels in marine and industrial applications. They are formulated to have excellent resistance to oxidation and viscosity increase over a long period of service. They have outstanding water separating properties and provide excellent corrosion protection.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point,	Flash Point,	Spec. Gravity at 15° C	TBN
	cSt at 100°C			°F (°C), ASTM D 97	°F (°C), ASTM D 92		mg KOH/g, ASTM D 2896
Mobilgard 312	12.0		100	-15.8 (-9)	510.8 (266)	0.896	15
Mobilgard 412	14.5		100	-15.8 (-9)	521.6 (272)	0.899	15
Mobilgard 512	19.4		100	-15.8 (-9)	539.6 (282)	0.903	15

Mobilgard™ Mobilgard™ 409 NC (No Chlorine) engine oil is a non-zinc and non-chlorine lubricant formulated with high-quality basestocks which provide low oil consumption characteristics, high-temperature oxidation resistance, and thermal stability. These basestocks are combined with an Electro Motive Diesel (EMD) and General Electric (GE) endorsed additive package, resulting in an engine oil with well-balanced properties.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point,	Flash Point,	Spec. Gravity at 15° C	TBN
	cSt at 100°C			°F (°C), ASTM D 97	°F (°C), ASTM D 92		mg KOH/g, ASTM D 2896
Mobilgard 409 NC	14.5		104	-0.4 (-18)	503.6 (262)		9

Mobilgard™ Mobilgard™ M30 Series oils are premium, extra high performance 30 TBN engine oils designed for use in some of the most severe residual-fuelled medium-speed diesel applications found in marine and stationary power industries. These market leading trunk piston engine oils are formulated utilizing the latest in additive detergent technology and provide outstanding residual fuel compatibility characteristics for excellent engine cleanliness, especially in crankcase, camshaft areas, ring belt and piston undercrowns. They also demonstrate excellent high temperature oxidation and thermal stability, low volatility, and high load carrying properties and corrosion protection.

Product	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point,	Flash Point,	Spec. Gravity at 15° C	TBN
	cSt at 100°C			°F (°C), ASTM D 97	°F (°C), ASTM D 92		mg KOH/g, ASTM D 2896
Mobilgard M330	12.0		100	21.2 (-6)	471.2 (244)	0.907	30
Mobilgard M430	14.0		100	21.2 (-6)	482 (250)	0.907	30

MARINE LUBRICANTS

TRUNK PISTON ENGINE OIL

Mobilgard™ Mobilgard™ M40 Series (M440) are premium, extra high performance 40 TBN engine oils designed for use in some of the most severe residual-fuelled medium-speed diesel applications found in marine and stationary power industries. These market leading trunk piston engine oils are formulated utilizing the latest in additive detergent technology and provide outstanding residual fuel compatibility characteristics for excellent engine cleanliness, especially in crankcase, camshaft areas, ring belt and piston undercrowns. They also demonstrate excellent high temperature oxidation and thermal stability, low volatility, and high load carrying properties and corrosion protection.

Product	Viscosity, ASTM D 445	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Spec. Gravity at 15° C	TBN
	cSt at 100°C				mg KOH/g, ASTM D 2896
Mobilgard M440	14.0	21.2 (-6)	482 (250)	0.907	40

Mobilgard™ Mobilgard™ M50 is a premium, extra high performance 50 TBN engine oil designed for use in some of the most severe residual-fuelled medium-speed diesel applications found in marine and stationary power industries. This market leading trunk piston engine oil is formulated utilizing the latest in additive detergent technology and provide outstanding residual fuel compatibility characteristics for excellent engine cleanliness, especially in crankcase, camshaft areas, ring belt and piston undercrowns. It also demonstrates excellent high temperature oxidation and thermal stability, low volatility, and high load carrying properties and corrosion protection.

Product	Viscosity, ASTM D 445	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Spec. Gravity at 15° C	TBN
	cSt at 100°C				mg KOH/g, ASTM D 2896
Mobilgard M50	14	21.2 (-6)	442.4 (228)	0.922	50

Mobil SHC™ Mobilgear SHC™ MT 68 premium performance, synthetic marine gear oil is designed to provide optimum equipment protection and oil life even under extreme conditions. The high viscosity index and low traction coefficient of this oil combine to provide a potential reduction in power consumption in many gear drives. Mobilgear SHC MT 68 contains an advanced and carefully blended proprietary additive system designed to provide excellent protection against conventional wear modes such as scuffing but also provides a high level of resistance against micropitting fatigue.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Spec. Gravity, @ 15.6° C kg/l, ASTM D 4052
		cSt at 40°C	cSt at 100°C				
Mobilgear SHC MT 68	68	68	10.8	149	-59.8 (-51)	464 (240)	0.855

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AVIATION PRODUCT LISTING BY APPLICATION

AVIATION LUBRICANTS	PRODUCT	PAGE
GEAR OIL	Mobil AGL™	79
GREASES	Mobil™ Aviation Grease SHC 100	79
	Mobilgrease™ 28	79
	Mobilgrease™ 33	79
HYDRAULIC FLUIDS	Exxon HyJet™ IV-A Plus	80
	Exxon HyJet™ V	80
	Mobil Aero™ HFA and HF.....	80
JET OILS	Mobil Avrex™ M Turbo 201/1010	81
	Mobil Avrex™ S Turbo 256	81
	Mobil Jet™ Oil II	81
	Mobil Jet™ Oil 254	81
	Mobil Jet™ Oil 387	81
	Mobil™ Turbo 319A-2	82
PISTON OIL	Exxon™ Aviation Oil Elite 20W-50	82

INDUSTRIAL

COMMERCIAL

PASSENGER

MARINE

AVIATION

GREASES

AVIATION LUBRICANTS

GEAR OIL

Mobil AGL™ is a high performance gear and bearing oil designed to provide outstanding service in terms of equipment protection, oil life and problem-free operation helping to enable increased customer productivity in civilian and military helicopter transmissions. This scientifically engineered oil is formulated from base fluids with an inherently high viscosity index and a unique, proprietary, additive system which enables this product to provide outstanding performance in extreme service applications at high and low temperatures, well beyond the capabilities of mineral oils. This product is resistant to mechanical shear, even in heavily loaded gear and high shear bearing applications.

Product	ISO VG	Viscosity, ASTM D 445		V.I. ASTM D 2270	Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Spec. Gravity 15.6° C/ 15.6° C
		cSt at 40°C	cSt at 100°C				
Mobil AGL	68	66.0	10.3	144	-54.4 (-48)	447.8 (231)	0.86

AVIATION LUBRICANTS

GREASES

Mobil™ Aviation Grease SHC 100 is a high performance synthetic grease which combines the unique features of a polyalphaolefin (PAO) synthetic base fluid with those of a high quality lithium complex soap thickener. The thickener system provides a high dropping point, excellent resistance to water wash, and a tenacious structural stability. The unique physical properties of the synthetic base oil, combined with selected additives, provide outstanding protection against wear, rust, corrosion, and high temperature degradation. The wax-free feature of the synthetic base oil allows for low-temperature mobility/pumpability and low starting and running torque values. Also, the traction property of the synthetic base fluid is considerably lower than mineral, allowing for temperature reductions in the load zone of rolling element bearings. Mobil Aviation Grease SHC 100 is the product of choice for aircraft wheel bearing applications.

Product	Color	Base Oil Viscosity		Dropping Point, °F (°C)	Water Washout, wt%
		cSt at 40°C	cSt at 100°C		
Mobil Aviation Grease SHC 100	Red	100	14.5	536 (280)	–

Mobilgrease™ 28 is a high performance, wide-temperature, antiwear grease designed to combine the unique features of a polyalphaolefin (PAO) synthetic base fluid with an organo-clay (non-soap) thickener. Its consistency is between an NLGI No. 1 and No. 2 grease. It offers outstanding performance over a wide temperature range. The wax-free nature of the synthetic base fluid, together with its high viscosity index compared to mineral oils, provide excellent low temperature pumpability, very low starting and running torque, and can help reduce operating temperatures in the load zone of rolling element bearings.

Product	Color	Base Oil Viscosity		Dropping Point, °F (°C)	Water Washout, 1 Hr at 41°C, wt%
		cSt at 40°C	cSt at 100°C		
Mobilgrease 28	Dark Red	30	5.7	586.4 (308)	1

Mobilgrease™ 33 is a high-performance lithium-complex grease designed for general-purpose aircraft use. Its consistency is between the NLGI grades 1 and 2. Mobilgrease 33 utilizes a 100% polyalphaolefin base oil and premium additives which ensure outstanding lubrication performance over a wide temperature range and operating conditions.

Product	Color	Base Oil Viscosity		Dropping Point, °F (°C)	Water Washout, 1 Hr at 38 °C (100 °F), wt%	Water Washout, 1 Hr at 79 °C (174 °F), wt%
		cSt at 40°C	cSt at 100°C			
Mobilgrease	Blue Green	12.5	3.2	474.8 (246)	1	6

Exxon HyJet™ IV-A Plus is a fire-resistant phosphate ester hydraulic fluid designed for use in commercial aircraft. It is our best-performing Type IV fluid and approaches to a great extent many of the performance capabilities of Type V fluids, including high temperature stability, fluid life, low density, and rust protection. Exxon HyJet IV-A plus meets the specifications of all major aircraft manufacturers and SAE AS1241.

Product	Kinematic Viscosity				V.I. ASTM D 2270	Pour Point, °F (°C)	Flash Point, °F (°C)	Spec. Gravity @ 25° C/25° C
	cSt at -53.9°C	cSt at 37.8°C	cSt at 98.9°C	cSt at 127.6°C				
Mobil HyJet IV-A plus	1320	10.6	3.6	2.6	280	<-79.6 (<-62)	347 (175)	0.996

Exxon HyJet™ V is a Type V fire-resistant phosphate ester hydraulic fluid which offers outstanding thermal and hydrolytic stability. Better stability means the extent of fluid degradation in aircraft systems will be less than Type IV fluids, in-service fluid life will be longer, and aircraft operator maintenance costs will be lower.

Product	Kinematic Viscosity			V.I. ASTM D 2270	Pour Point, °F (°C)	Flash Point, °F (°C)	Spec. Gravity @ 25° C/25° C
	cSt at -53.9°C	cSt at 37.8°C	cSt at 98.9°C				
Mobil HyJet V	1360	10.7	3.7	280	<-79.6 (<-62)	339.8 (171)	0.997

Mobil Aero™ HFA and HF are formulated for aircraft systems where use of hydrocarbon-based hydraulic fluids is required. They are low viscosity products, high VI (viscosity index) fluid with excellent low temperature properties, good anti-wear performance, and good chemical stability. Mobil Aero HFA and HF are composed of mineral base oil stock and contain shear-stable VI improvers.

Product	Kinematic Viscosity		V.I. ASTM D 2270	Pour Point, °F (°C)	Flash Point, COC, °F (°C)	Spec. Gravity 60° C/60° C
	cSt at 40°C	cSt at 100°C				
Mobil Aero HFA	14.0	5.2	370	-83.2 (-64 (-60 max))	224.6 (107 (93 min))	0.876
Mobil Aero HF	14.0 (13.2 min)	5.2 (4.9 min)	370	-83.2 (-64 (-60 max))	224.6 (107)	0.882

AVIATION LUBRICANTS

JET OILS

Mobil Avrex™ M Turbo 201/1010 gas turbine lubricant is a combination of a proven aviation engine mineral oil base stock and an ashless additive package. The effective operating range for Mobil Avrex M Turbo 201/1010 is between -40°C and 121°C (-40°F and 250°F). The pour point is below -57°C (-70°F).

Product	Viscosity		Pour Point, °F (°C)	Flash Point, °F (°C)	Spec. Gravity 15° C/15° C
	cSt at 40°C	cSt at 100°C			
Mobil Avrex M Turbo 201/1010	10.4	2.6	-76 (-60)	293 (145)	0.885

Mobil Avrex™ S Turbo 256 gas turbine lubricant is a combination of a highly stable synthetic base fluid and a unique chemical additive package. The combination provides outstanding thermal and oxidative stability to resist deterioration and deposit formation in both the liquid and vapor phases, as well as excellent resistance to foaming.

Product	Viscosity		Pour Point, °F (°C)	Flash Point, °F (°C)	Spec. Gravity 15° C/15° C
	cSt at 40°C	cSt at 100°C			
Mobil Avrex S Turbo 256	13.3	3.3	-76 (-60)	561.2 (224)	0.9634

Mobil Jet™ Oil II is a high performance aircraft-type gas turbine lubricant formulated with a combination of a highly stable synthetic base fluid and a unique chemical additive package. The combination provides outstanding thermal and oxidative stability to resist deterioration and deposit formation in both the liquid and vapour phases, as well as excellent resistance to foaming. The effective operating range of Mobil Jet Oil II is between -40°C (-40°F) and 204°C (400°F).

Product	Viscosity		Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92
	cSt at 40°C	cSt at 100°C		
Mobil Jet Oil II	27.6	5.1	-74.2 (-59)	518 (270)

Mobil Jet™ Oil 254 is a third-generation, extra high performance, synthetic aircraft-type gas turbine lubricant engineered to meet the performance requirements for gas turbine engines used in commercial and military aircraft. This product is formulated from a specially prepared, hindered-ester base stock and fortified with a unique chemical additive package. The result is a product having outstanding thermal and oxidation stability that resists deterioration and deposit formation while maintaining the physical characteristics required by builder and military specifications. The physical properties of Mobil Jet Oil 254 are similar to those currently available, earlier-generation gas turbine lubricants. The effective operating range of the lubricant is between -40°C (-40°F) and 232°C (450°F).

Product	Viscosity		Pour Point, °F (°C), ASTM D 97	Flash Point, °F (°C), ASTM D 92	Spec. Gravity
	cSt at 40°C	cSt at 100°C			
Mobil Jet Oil 254	26.4	5.3	-79.6 (-62)	489.2 (254)	1.0044

Mobil Jet™ Oil 387 has been developed to meet the performance requirements of both current and future, advanced gas turbine engines used in commercial and military service. Made from a specially prepared, ester base stock, Mobil Jet Oil 387 is fortified with a unique chemical additive package. The resulting lubricant has outstanding thermal and oxidation stability that resists deterioration and deposit formation. The physical properties of Mobil Jet Oil 387 conform to required builder and military specifications.

Product	Viscosity		Pour Point, °F (°C)	Flash Point, °F (°C), min
	cSt at 40°C	cSt at 100°C		
Mobil Jet Oil 387	25.9	5.2	-70.6 (-57)	532.4 (278)

Mobil™ Turbo 319A-2 is a synthetic lubricant developed to meet the performance requirements of Russian gas turbine aircraft engines which operate on mineral-oil-based lubricants. Formulated from a synthetic hydrocarbon combination of polyalphaolefin (PAO) and hindered-ester based stock, Mobil Turbo 319A-2 is fortified with a unique chemical additive system. The resulting product has far outstanding thermal and oxidation stability. The ability of Mobil Turbo 319A-2 to resist deterioration and deposit formation allows the potential for extended oil drain intervals and less frequent maintenance.

Product	Viscosity		Pour Point, °F (°C)	Flash Point, °F (°C)	Spec. Gravity
	cSt at 40°C	cSt at 100°C			
Mobil Turbo 319A-2	16.2	3.70	-76 (-60)	453.2 (234)	0.852

AVIATION LUBRICANTS

PISTON OIL

Exxon™ Aviation Oil Elite 20W-50 is a premium quality, semi-synthetic, ashless-dispersant aviation piston engine oil. It is formulated from select, highly refined mineral base oils, a polyalphaolefin synthetic base oil, and ashless performance additives providing outstanding engine cleanliness, wear protection, and corrosion protection. Aviation Oil Elite 20W-50 is designed to satisfy the requirements of all opposed piston engine manufacturer's requirements under a wide range of climatic conditions.

Product	Kinetic Viscosity		V.I. ASTM D 2270	Pour Point, °F (°C)	Flash Point COC, °F (°C)
	cSt at 40°C	cSt at 100°C			
Mobil Aviation Oil Elite 20W-50	180	20.2 (16.3 min, 21.9 max)	130	-16.6 (-27)	496.4 (258)

Mobil Grease™

Decoding Many Mobil Grease Product Names

Mobil	grease	XHP	222	Special
Master Brand	Product Brand	Product Family	ISO / NLGI	Identifier (Moly / Application)

Product Brands vs Thickener Type	Lith	- Lithium Complex	Temp	- Clay
	Polyrex	- Polyurea	Lux	- Lithium
	Centaur	- Calcium Sulfonate	Grease	- Multiple technologies

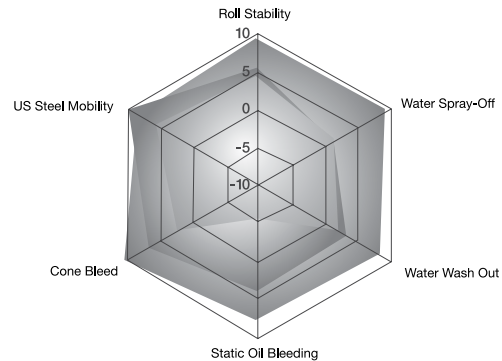
ISO / NLGI The first two numbers correspond to the first two numbers of the base oil *ISO Viscosity Grade* (e.g. 220). The last number corresponds to the *NLGI grade*.

Identifier Moly content: Special – 0.75 or 1%; Moly – 3%; Mine – 5%

Mobil Grease Product Families

Core Industrial Application Product Families:	Mobilith SHC, Mobilgrease XHP
Select Specialty Industrial Application Product Families:	Mobil SHC Polyrex, Mobil Polyrex, Mobil Centaur XHP
Core Commercial Vehicle Application (On/Off Highway) Product Families:	Mobil Delvac Xtreme, Mobilgrease XHP, Mobil Centaur
Core Personal Vehicle Installer Greases:	Mobil 1 Synthetic Grease, Mobilgrease XHP 222

Mobil Grease Balanced Performance



Mobilgrease XHP 222
Grease A
Grease S

10 = Excellent Performance
-10 = Poor Performance

GREASE PRODUCT LISTING BY APPLICATION

GREASES	PRODUCT	PAGE
COMMERCIAL VEHICLE GREASES – (INCLUDES GREASES FOR ON-HWY TRUCKS AND OFF-HWY CONSTRUCTION AND MINING EQUIPMENT)	Mobil Delvac™ Xtreme Grease.....	86
	Mobil Centaur™ Moly Series.....	86
	Mobilgrease™ XHP 460 Series.....	90
	Mobilgrease™ XHP 222 Series.....	90
	Mobil Centaur™ XHP 460 Series.....	91
	Mobil SHC™ Grease 68 Moly.....	86
	Mobilgrease™ XHP Mine Series.....	86
	Mobil Centaur™ XHP Mine Series.....	87
	Mobil Dynagear™ Series.....	87
	Mobilgrease™ CM Series.....	87
INDUSTRIAL – CLAY THICKENED	Mobiltemp SHC™ 32.....	87
INDUSTRIAL – COUPLING GREASES	Mobilgrease™ XTC.....	88
	Mobilux™ EP 111.....	88
INDUSTRIAL – ELECTRIC MOTOR GREASES	Mobilith SHC™ 100.....	90
	Mobil Polyrex™ EM.....	88
	Unirex™ N.....	88
INDUSTRIAL – ENVIRONMENTALLY AWARE GREASES	Mobil SHC™ Grease 100 EAL Series.....	89
INDUSTRIAL – FOOD INDUSTRY GREASES	Mobil SHC Polyrex™ Series.....	89
	Mobilgrease™ FM Series.....	89
INDUSTRIAL – MULTI-PURPOSE GREASES	Mobilith SHC™ Series.....	90
	Mobilgrease™ XHP 220 Series.....	90
	Mobilgrease™ XHP 460 Series.....	90
	Mobil Centaur™ XHP 460 Series.....	91
	Mobil Polyrex™ EP 2.....	91
	Mobilux™ EP Series.....	91

INDUSTRIAL

COMMERCIAL

PASSENGER

MARINE

AVIATION

GREASES

GREASES PRODUCT LISTING BY APPLICATION

CONTINUED

GREASES	PRODUCT	PAGE
INDUSTRIAL – PAPER MACHINE GREASES	Mobilith SHC™ PM	92
INDUSTRIAL – SEMI-FLUID GREASES	Mobilith SHC™ 007	90
	Mobilgrease™ XHP 005	90
	Mobilux™ EP 023	91
INDUSTRIAL – SPECIALTY SYNTHETIC GREASES	Mobil SHC Polyrex™ Series	89
	Mobil SHC™ PF 462	93
	Unirex™ S 2	93
	Beacon™ 325	93
	Mobil Dynagear™ Series	86
INDUSTRIAL – STEEL MILL GREASES	Mobil Centaur™ XHP 460 Series	91
	Mobilgrease™ XHP 460 Series	90
	Mobilgrease™ HT Series	94
INDUSTRIAL – WIND TURBINE GREASE	Mobil SHC™ Grease 102 WT	94
	Mobil SHC™ Grease 460 WT	94
PASSENGER VEHICLE GREASES	Mobil 1™ Synthetic Grease	95
	Mobilgrease™ XHP 222	90
	Ronex™ MP	95
	Mobil Ininitec™ 152	95

Mobil Delvac™ Mobil Delvac™ Xtreme Grease is an extra high performance extreme-pressure grease. It provides very good adhesion and cohesion, protection against rust and corrosion, resistance to water wash, and potential for long service life.

Product	Color, Visual	NLGI Grade	Thickener Type	Viscosity of Oil, ASTM D 445 cSt at 40°C	Dropping Point, °F (°C) ASTM D 2265	Water Washout, ASTM D 1264, 79 °C, % Loss
Mobil Delvac Xtreme Grease	Orange	2	Li-Complex	320	500 (260)	6

Mobil Grease™ Mobil Centaur™ Moly Series of advanced Calcium Sulfonate technology greases exhibit excellent corrosion and water-resistance properties and have inherent extreme-pressure protection properties that enhance load-carrying ability.

Product	Color, Visual	NLGI Grade	Thickener Type	Molybdenum DiSulfide, wt%, Calculated	Viscosity of Oil, ASTM D 445 cSt at 40°C	Dropping Point, °F (°C) ASTM D 2265	Water Washout, ASTM D 1264, 79 °C, % Loss	Water Sprayoff ASTM D 4049, % Loss
Mobil Centaur Moly 1	Grey	1	Calcium Sulfonate	3%	320	550.4 (288)	1.0	25
Mobil Centaur Moly 2	Grey	2	Calcium Sulfonate	3%	320	536 (280)	1.0	20

Mobil Grease™ Mobil Centaur™ XHP 460 Series..... 91

Mobil Grease™ Mobilgrease™ XHP 222 Series..... 90

Mobil Grease™ Mobilgrease™ XHP 460 Series..... 90

Mobil Grease™ Mobil SHC™ Grease 68 Moly is a synthetic all-weather grease that offers excellent lubrication performance over a very wide operating temperature range and extraordinary low temperature pumpability. Mobil SHC Grease 68 Moly is designed for use in central systems on heavy duty mobile equipment running in arctic conditions. It is fortified with 5% Molybdenum disulphide, which is required by several major OEMs for their equipment. Mobil SHC Grease 68 Moly is designed to be dispensable in central grease systems at temperatures as low as -50°C.

Product	Color, Visual	NLGI Grade	Thickener Type	Molybdenum DiSulfide, Wt. %	Viscosity of Oil, ASTM D 445 cSt at 40°C	Dropping Point, °F (°C) ASTM D 2265	Lincoln Ventmeter, psi at -30°F	US Steel Mobility, g/min at -30°F
Mobil SHC Grease 68 Moly	Gray-Black	0	Li-Complex	5%	68	433.4 (223)	331	25.8

Mobil Grease™ Mobilgrease™ XHP Mine Series greases are specifically designed for the lubrication of extra heavy duty off-highway and mining equipment. The series covers a wide range of operating conditions to help improve productivity. The Mobilgrease XHP Mine Series has excellent extreme pressure and anti-wear properties in addition to exceptional staying power, very good water wash-out, sprayoff, and extended service capabilities under harsh operating conditions. Mobilgrease XHP 100 Mine is designed to provide good pumpability in central systems down to -40°C.

Product	Color, Visual	NLGI Grade	Thickener Type	Molybdenum DiSulfide, Wt. %	Viscosity of Oil, ASTM D 445 cSt at 40°C	Dropping Point, °F (°C) ASTM D 2265	Water Washout, ASTM D 1264, 79 °C, % Loss	Water Sprayoff ASTM D 4049, % Loss
Mobilgrease XHP 100 Mine	Gray-Black	0	Li-Complex	5%	100	392 (200)	-	-
Mobilgrease XHP 320 Mine	Gray-Black	0	Li-Complex	5%	320	449.6 (232)	-	-
Mobilgrease XHP 321 Mine	Gray-Black	1	Li-Complex	5%	320	474.8 (246)	10	28
Mobilgrease XHP 322 Mine	Gray-Black	2	Li-Complex	5%	320	543.2 (284)	2	16

GREASES

COMMERCIAL VEHICLE GREASES (CONTINUED)

Mobil Grease™ Mobil Centaur™ XHP Mine Series greases are a premium family of greases formulated with advanced calcium sulfonate thickener technology and 5% molybdenum disulfide. The series is specifically designed for the lubrication of extra heavy-duty off-highway and mining equipment. The calcium sulfonate thickener carries both inherent rust protection and extreme pressure (EP) properties. Compared to conventional soap-base thickeners (i.e. lithium, aluminum, calcium soaps), the calcium sulfonate thickener used in Mobil Centaur XHP Mine Series excels in water saturated environments, providing longer re-lubrication intervals. The inherent EP properties exhibit great stability in the presence of water, allowing a balance between wear protection and resistance to corrosion.

Product	Color, Visual	NLGI Grade	Thickener Type	Molybdenum DiSulfide, Wt. %	Viscosity of Oil,	Dropping Point,	Water Washout,	Water Sprayoff
					ASTM D 445 cSt at 40°C	°F (°C) ASTM D 2265	ASTM D 1264, 79 °C, % Loss	ASTM D 4049, % Loss
Mobil Centaur XHP 151 Mine	Gray-Black	1	Calcium Sulfonate	5%	150	536 (280)	1	—
Mobil Centaur XHP 152 Mine	Gray-Black	2	Calcium Sulfonate	5%	150	536 (280)	5	—
Mobil Centaur XHP 461 Mine	Gray-Black	1	Calcium Sulfonate	5%	460	536 (280)	2	—
Mobil Centaur XHP 462 Mine	Gray-Black	2	Calcium Sulfonate	5%	460	536 (280)	1	—

Mobil Grease™ Mobil Dynagear™ Series is a family of premium performance open gear lubricants designed to provide outstanding protection of heavily loaded open gear sets exposed to a wide range of operating conditions. The Mobil Dynagear Series was specifically formulated to meet the needs of heavily loaded gearsets commonly found in the mining industry that require exceptional EP /Anti-Wear performance and which would remain in place even in tough conditions of water spray, dust and dirt, and high and low temperatures.

Product	Color, Visual	NLGI Grade	Thickener Type	Molybdenum DiSulfide, Wt. %	Viscosity of Oil,	Dropping Point,
					ASTM D 445 cSt at 40°C	°F (°C) ASTM D 2265
Mobil Dynagear 600 SL	Gray-Black	0.5	Lithium	>2	600	388.4 (198)
Mobil Dynagear 800 Extra	Gray-Black	0.5	Lithium	>2	800	347 (175)
Mobil Dynagear 2000	Gray-Black	0.5	Lithium	>2	2000	379.4 (193)
Mobil Dynagear 4000	Gray-Black	0.5	Lithium	>2	4000	350.6 (177)

Mobil Grease™ Mobilgrease™ CM Series products are a family of quality extreme-pressure commercial vehicle greases.

Product	Color, Visual	NLGI Grade	Thickener Type	Molybdenum DiSulfide, Wt. %	Viscosity of Oil,	Dropping Point, °F (°C)	Water Washout,
					ASTM D 445 KV at 40°C	ASTM D 2265	ASTM D 1264, 79 °C, % Loss
Mobilgrease CM-L	Grey	1	Li-Complex	3	150	500 (260)	12
Mobilgrease CM-P	Grey	2	Li-Complex	3	320	500 (260)	6
Mobilgrease CM-W	Orange	1	Li-Complex	0	150	500 (260)	12
Mobilgrease CM-S	Orange	2	Li-Complex	0	320	500 (260)	6

GREASES

INDUSTRIAL – CLAY THICKENED

Mobil SHC™ Mobiltemp SHC™ 32 is a high performance anti-wear grease primarily intended for high temperature applications. It combines the unique features of synthetic base fluids with those of an organo-clay, non-soap thickener. The excellent resistance to thermal/oxidative degradation provided by the base oil, coupled with the excellent high temperature structural stability and high dropping point of the clay thickener result in an outstanding high temperature grease. The wax-free nature of the synthetic base fluid and its high viscosity index also provide outstanding low temperature lubrication as well as excellent film protection at high temperatures.

Product	Color, Visual	NLGI Grade	Thickener Type	Dropping Point, °F (°C),	Viscosity of Oil,
				ASTM D 2265	ASTM D 445 cSt at 40°C
Mobiltemp SHC 32	Red	1.5	Clay	500+ (260+)	32

Mobil Grease **Mobilgrease™ XTC** is an extra high performance product designed for use in high speed coupling applications. It is manufactured with a select high viscosity mineral base oil and an extremely effective, heavy-duty additive package. Mobilgrease XTC is formulated to provide low bleed as well as high temperature stability, properties critical to modern coupling lubrication and protection. The base oil and extreme pressure (EP) / anti-wear (AW) additive package work to reduce friction wear from sliding tooth contact, providing rust and corrosion protection, and as well as high temperature stability for this leading edge product. Meets AGMA CG-1 and CG-2 coupling specifications.

Product	Color, Visual	NLGI Grade	Thickener Type	Dropping Point, °F (°C), ASTM D 2265	Viscosity of Oil, ASTM D 445
					cSt at 40°C
Mobilgrease XTC	Dark Brown	1	Lithium	419 (215)	680

Mobil Grease **Mobilux™ EP 111** is an extra high performance grease primarily designed for lubrication of all AGMA CG-3 couplings. It is specifically formulated to help protect against wear even in heavily loaded misaligned low speed gear couplings. Mobilux EP 111 is a lithium hydroxystearate grease formulated with an extremely heavy, viscous mineral base oil. Mobilux EP 111 also contains an oil soluble molybdenum additive, as well as a very effective corrosion inhibitor. It is an NLGI 1 Grade grease.

Product	Color, Visual	NLGI Grade	Thickener Type	Viscosity of Oil, ASTM D 445	Mineral Oil V.I., ASTM D 2270	Dropping Point, °F (°C) ASTM D 2265
				cSt at 100°C		
Mobilux EP 111	Black	1	Lithium	45	95	500 (260)

GREASES

INDUSTRIAL – ELECTRIC MOTOR GREASES

Mobil SHC **Mobilith SHC™ 100**..... 90

Mobil Grease **Mobil Polyrex™ EM** super-premium greases are specially formulated for electric-motor bearings. The advanced thickener formulation and proprietary manufacturing techniques provide improved bearing performance and protection for long electric motor life.

Product	Color, Visual	NLGI Grade	Viscosity of Oil, ASTM D 445		V.I., ASTM D 2270	Dropping Point, °F (°C) ASTM D 2265	Water Washout, ASTM D 1264, 79°C,
			cSt at 40°C	cSt at 100°C			% Loss
Mobil Polyrex EM	Blue	2	115	12.2	95	500 (260)	1.9
Mobil Polyrex EM 103	Blue	3	115	12.2	95	518 (270)	0.8

Mobil Grease **Unirex™ N** greases are premium-quality, lithium-complex products suitable for high-temperature service in rolling-element bearings. These versatile greases can be used in a wide range of industrial applications and are particularly recommended for electric-motor lubrication.

Product	Color, Visual	NLGI Grade	Thickener Type	Viscosity of Oil, ASTM D 445	V.I., ASTM D 2270	Dropping Point, °F (°C) ASTM D 2265	Water Washout, ASTM D 1264, 79°C,
				cSt at 40°C			% Loss
Unirex N 2	Green	2	Li-Complex	115	95	536 (280)	3.7
Unirex N 3	Green	3	Li-Complex	115	95	455 (235)	3.5

GREASES

INDUSTRIAL – ENVIRONMENTALLY AWARE GREASES

Mobil SHC™ Mobil SHC™ Grease 100 EAL Series are high performance greases designed specifically for applications which are environmentally sensitive. These leading products are biodegradable and virtually non-toxic greases formulated from a biodegradable synthetic ester base oil and a lithium soap thickener. The wax-free nature of the synthetic base fluid, together with its low traction coefficient, provide excellent low temperature pumpability and very low starting and running torque - a significant benefit considering many environmentally sensitive applications are located outdoors.

Product	Base Oil ISO VG	Color, Visual	NLGI Grade	Thickener Type	Dropping Point, °F (°C) ASTM D 2265	Water Washout,
						ASTM D 1264, 79°C, % Loss
Mobil SHC Grease 101 EAL	100	Tan	1	Lithium	356 (180)	8.0
Mobil SHC Grease 102 EAL	100	Tan	2	Lithium	356 (180)	6.5

GREASES

INDUSTRIAL – FOOD INDUSTRY GREASES

Mobil SHC™ Mobil SHC Polyrex™ Series of greases are specifically designed to improve your productivity by solving high temperature lubrication problems in both general industry and food processing applications. Developed using advanced Polyurea thickener technology, these synthetic, polymer-enhanced greases bring a high temperature solution to the market while carrying a full NSF H1 registration.

Product	NLGI Grade	Thickener Type	Viscosity, ASTM D 445		Dropping Point, °F (°C) ASTM D 2265	Water Washout,	Water Sprayoff
			40°C, cSt	100°C, cSt		ASTM D 1264, 79°C, % Loss	ASTM D 4049, % Loss
Mobil SHC Polyrex 005	00	Polyurea	220	30	–	37	–
Mobil SHC Polyrex 221	1	Polyurea	220	30	518 (270)	9	80
Mobil SHC Polyrex 222	2	Polyurea	220	30	500 (260)	7	28
Mobil SHC Polyrex 462	2	Polyurea	460	40	518 (270)	5	30

MobilGrease™ Mobilgrease™ FM Series are high performance multi-purpose products designed specifically for the lubrication of food processing machinery. Mobilgrease FM 101 and FM 222 are formulated with components meeting the requirements of CFR 178.3570, Chapter 21, and are NSF registered as H1 classified lubricants. The Mobilgrease FM 101 and FM 222 are manufactured in facilities registered to the requirements of ISO 21469 helping to ensure that the highest levels product integrity are maintained.

Product	Color, Visual	NLGI Grade	Thickener Type	Dropping Point, °F (°C), ASTM D 2265	Viscosity of Oil,
					ASTM D 445 cSt at 40°C
Mobilgrease FM 101	White	1	Aluminum Complex	500 (260)	100
Mobilgrease FM 222	White	2	Aluminum Complex	500 (260)	220

Mobil SHC™ Mobilith SHC™ Series greases are high performance products designed for a wide variety of applications at extremes of temperature. They combine the unique features of synthetic base fluids with those of a high quality lithium complex thickener. The wax-free nature of synthetic fluids and the low coefficient of traction (compared with mineral oils), provide excellent low temperature pumpability and very low starting and running torque. These products offer the potential for energy savings and can reduce operating temperatures in the load zone of spherical roller and ball bearings. The lithium complex thickener contributes excellent adhesion, structural stability and resistance to water. The greases have a high level of chemical stability and are formulated with special additive combinations to provide excellent protection against wear, rust and corrosion, and providing operating viscosity at high and low temperatures. Mobilith SHC Series greases are available in seven grades, varying in base oil viscosity from ISO VG 100 to 1500 and in NLGI grade from 2 to 00.

Product	Color, Visual	NLGI Grade	Thickener Type	Viscosity Oil, ASTM D 445 cSt at 40°C	Dropping Point, °F (°C) ASTM D 2265	Water Washout, ASTM D 1264, 79°C, % Loss
Mobilith SHC 100	Red	2	Li-Complex	100	509 (265)	6
Mobilith SHC 220	Red	2	Li-Complex	220	509 (265)	3
Mobilith SHC 221	Light Tan	1	Li-Complex	220	509 (265)	4
Mobilith SHC 460	Red	1.5	Li-Complex	460	509 (265)	3
Mobilith SHC 1000 Special	Grey Black	2	Li-Complex	1000	509 (265)	2.6
Mobilith SHC 1500	Red	1.5	Li-Complex	1500	509 (265)	2.5
Mobilith SHC 007	Red	00	Li-Complex	460	–	–

Mobil Grease™ Mobilgrease™ XHP 220 Series greases are extended service lithium complex greases intended for a wide variety of applications and severe operating conditions. These greases were designed to outperform our conventional products by applying cutting edge, proprietary, lithium complex manufacturing technology. They are formulated to provide excellent high temperature performance with superb adhesion, structural stability and resistance to water contamination. These greases have a high level of chemical stability and offer excellent protection against rust and corrosion. These greases feature high dropping points and maximum recommended operating temperature of 140° C (284°F). Mobilgrease XHP 220 greases are available in NLGI grades 00, 0, 1, 2 and 3 with an ISO VG 220 base oil viscosity.

Product	Color, Visual	NLGI Grade	Thickener Type	Molybdenum DiSulfide, wt%	Viscosity of Oil, ASTM D 445 cSt at 40°C	Dropping Point, °F (°C) ASTM D 2265
Mobilgrease XHP 005	Dark Blue	00	Li-Complex	–	220	–
Mobilgrease XHP 220	Dark Blue	0	Li-Complex	–	220	518 (270)
Mobilgrease XHP 221	Dark Blue	1	Li-Complex	–	220	536 (280)
Mobilgrease XHP 222	Dark Blue	2	Li-Complex	–	220	536 (280)
Mobilgrease XHP 223	Dark Blue	3	Li-Complex	–	220	536 (280)
Mobilgrease XHP 222 Special	Grey-Black	2	Li-Complex	0.75%	220	536 (280)

Mobil Grease™ Mobilgrease™ XHP 460 Series greases are extended service lithium complex greases intended for a wide variety of heavy duty applications and operating conditions. These greases were designed to outperform our conventional products by applying cutting edge, proprietary, lithium complex manufacturing technology. They are formulated to provide excellent high temperature performance with superb adhesion, structural stability and resistance to water contamination. These greases have a high level of chemical stability and offer excellent protection against rust and corrosion. These greases feature high dropping points and maximum recommended operating temperature of 140° C (284°F). Mobilgrease XHP 460 greases are formulated with an ISO VG 460 base oil viscosity and are available in NLGI grades 1 and 2. Mobilgrease XHP 462 Moly is fortified with 3% molybdenum disulfide to provide enhanced EP and AW protection in heavily loaded and high sliding applications.

Product	Color, Visual	NLGI Grade	Thickener Type	Molybdenum DiSulfide, wt%	Viscosity of Oil, ASTM D 445 cSt at 40°C	Dropping Point, °F (°C) ASTM D 2265
Mobilgrease XHP 461	Dark Blue	1	Li-Complex	–	460	536 (280)
Mobilgrease XHP 462	Dark Blue	2	Li-Complex	–	460	536 (280)
Mobilgrease XHP 462 Moly	Grey	2	Li-Complex	3%	460	536 (280)

GREASES

INDUSTRIAL – MULTI-PURPOSE GREASES (CONTINUED)

Mobil Grease **Mobil Centaur™ XHP 460 Series** greases are a premium family of greases formulated with advanced calcium sulfonate thickener technology. The calcium sulfonate thickener carries both inherent rust protection and extreme pressure (EP) properties. Compared to conventional soap-base thickeners (i.e. lithium, aluminum, calcium soaps), the calcium sulfonate thickener used in Mobil Centaur XHP 460 Series excels in water saturated environments, providing rust protection between long re-lubrication intervals. The inherent EP properties exhibit great stability in the presence of water, allowing a balance between wear protection and resistance to corrosion.

Product	Color, Visual	NLGI Grade	Thickener Type	Viscosity of Oil, ASTM D 445		Dropping Point, °F (°C) ASTM D 2265	Water Washout, ASTM D 1264, 79°C, % Loss	Water Sprayoff, ASTM D 4049, % Loss
				cSt at 40°C	cSt at 100°C			
Mobil Centaur XHP 221	Brown	1.5	Calcium Sulfonate	220	604.4 (318)	1.0	—	
Mobil Centaur XHP 461	Amber	1	Calcium Sulfonate	460	527 (275)	1.0	25	
Mobil Centaur XHP 462	Amber	2	Calcium Sulfonate	460	527 (275)	0.5	20	

Mobil Grease **Mobil Polyrex™ EP 2** is a shear-stable polyurea grease with excellent extreme-pressure (EP) and load-carrying characteristics. The proprietary polyurea thickener system exhibits excellent resistance to oxidation and oil separation at operating temperatures as high as 350°F. With its outstanding high-temperature oxidation stability, load-carrying capability, shear stability, water resistance and wide operating temperature range, Mobil Polyrex EP 2 is an excellent multi-purpose grease for a wide array of industrial and construction applications.

Product	Color, Visual	NLGI Grade	Thickener Type	Viscosity of Oil, ASTM D 445			Dropping Point, °F (°C) ASTM D 2265	Water Washout, ASTM D 1264, 79°C, % Loss	Water Sprayoff, ASTM D 4049, % Loss
				cSt at 40°C	cSt at 100°C	V.I., ASTM D 2270			
Mobil Polyrex EP 2	Green	2	Polyurea	235	18.4	85	536 (280)	2.7	15

Mobil Grease **Mobilux™ EP Series** greases are general-purpose industrial greases and two special-duty semi-fluid greases. These lithium hydroxystearate greases are formulated to provide extra protection against wear, rusting and water washout.

Product	Color, Visual	NLGI Grade	Thickener Type	Dropping Point, °F (°C), ASTM D 2265	Viscosity of Oil, ASTM D 445
					cSt at 40°C
Mobilux EP 0	Brown	0	Lithium	374 (190)	160
Mobilux EP 1	Brown	1	Lithium	374 (190)	160
Mobilux EP 2	Brown	2	Lithium	374 (190)	160
Mobilux EP 023	Brown	000	Lithium	—	320

Mobil SHC™ Mobilith SHC™ PM greases are high performance products designed specifically for severe paper machine applications, including extreme temperature environments and exposure to different qualities of water. Mobilith SHC PM greases combine the unique features of a synthetic base fluid with those of a high quality lithium complex thickener. The wax-free nature of the synthetic base fluid provides excellent low temperature pumpability and low starting and running torque compared to non-synthetic oil products of the same viscosity. The high viscosity index of the synthetic base fluid ensures excellent film protection at high temperatures. The lithium complex thickener contributes excellent adhesion, structural stability and resistance to water. These properties are complemented by a special additive system to provide rust and corrosion resistance, wear protection, thermal/oxidative resistance and to enhance water resistance properties. Mobilith SHC PM 220 and Mobilith SHC PM 460 are both NLGI grade 1.5 with base fluids of ISO VG 220 and 460, respectively.

Product	Color, Visual	NLGI Grade	Thickener Type	Viscosity of Oil, ASTM D 445 cSt at 40°C	Dropping Point, °F (°C) ASTM D 2265	Water Washout, ASTM D 1264, 79° C, % Loss
Mobilith SHC PM 220	Off-White	1.5	Li-Complex	220	527 (275)	2
Mobilith SHC PM 460	Off-White	1.5	Li-Complex	460	527 (275)	3

Mobil Grease™ Mobilgrease™ XHP 005	90
Mobil SHC™ Mobilith SHC™ 007	90
Mobil Grease™ Mobilux™ EP 023	91

GREASES

INDUSTRIAL – SPECIALTY SYNTHETIC GREASES

Mobil SHC™ Mobil SHC Polyrex™ Series 89

Mobil SHC™ The **Mobil SHC™ PF 462** grease is formulated with perfluoropolyether that has been thickened with polytetrafluoroethylene. Mobil SHC PF 462 is a long-life, severe-service grease for bearings, valves, seals and other applications that require oxidation stability and lubrication performance at high temperatures.

Product	NLGI Grade	Viscosity, ASTM D 445		Dropping Point, °F (°C) ASTM D 2265	Water Washout,	Water Sprayoff,
		cSt at 40°C	cSt at 100°C		ASTM D 1264, 79°C, % Loss	ASTM D 4049, % Loss
Mobil SHC PF 462	2	440	42	496.4 (258)	0.94	5

Mobil Grease™ Beacon™ 325 is a high performance grease specifically formulated for the lubrication of precision equipment operating at moderate and low temperatures. It is made with a synthetic base oil of extremely low viscosity and low volatility plus a lithium soap. Beacon 325 is characterized by good mechanical stability, a high degree of resistance to water and extremely high oxidation stability. As its base oil viscosity is low and the viscosity index of the fluid is high, the grease has excellent low temperature properties including low starting and running torque at very cold temperatures and good pumpability.

Product	Color, Visual	NLGI Grade	Thickener Type	Dropping Point, °F (°C),	Viscosity of Oil,
				ASTM D 2265	ASTM D 445 cSt at 40°C
Beacon 325	Tan	1-2	Lithium	356 (180)	12

Mobil Grease™ Mobil Dynagear™ Series 86

Mobil Grease™ Mobil Centaur™ XHP 460 Series 91

Mobil Grease Mobilgrease™ XHP 460 Series 90

Mobil Grease Mobilgrease™ HT Series greases are high performance Extreme Pressure greases with exceptional resistance to the water contamination conditions typical of steel mill, surface mining, and off-highway conditions. Additionally, Mobilgrease HTR, HTM and HTS are formulated with excellent corrosion resistance. Mobilgrease HTM and HTR provide good water and corrosion resistance along with formulations more capable of providing good dispensing characteristics in central systems. The combination of the lithium complex soap with an advanced additive system provide high temperature performance properties.

Product	Color, Visual	NLGI Grade	Thickener Type	Viscosity of Oil, ASTM D 445 cSt at 40°C	Dropping Point, °F (°C) ASTM D 2265	Water Washout, ASTM D 1264, 79°Cw, % Loss	Water Sprayoff ASTM D 4049, % Loss
Mobilgrease HTR	Black	0.5	Li-Complex	320	536 (280)	—	—
Mobilgrease HTM	Black	1.5	Li-Complex	320	536 (280)	5.5	—
Mobilgrease HTS	Black	2	Li-Complex	680	563 (295)	5.5	—

Mobil SHC™ Mobil SHC™ Grease 102 WT is scientifically engineered to meet or exceed the demanding requirements for severe wind turbine pitch and yaw applications at extreme cold temperatures. The unique features of synthetic base fluids are combined with those of a high quality lithium complex thickener. This state-of-the-art formulation helps contribute to excellent extreme low temperature application as well as high-temperature performance with powerful structural stability and resistance to water.

Product	Color, Visual	NLGI Grade	Thickener Type	Viscosity of Oil, ASTM D 445 cSt at 40°C	Dropping Point, °F (°C) ASTM D 2265	Flow Pressure, mbar at -50°C	Low Temperature Torque @ -40°C, g-cm Starting	Low Temperature Torque @ -40°C, g-cm Running
Mobil SHC Grease 102 WT	Beige	2	Li-Complex	100	505.4 (263)	650	1110	171

Mobil SHC™ Mobil SHC™ Grease 460 WT is a high performance product especially suited to meet or exceed the demanding requirements of wind turbine applications at extremes of temperature. The unique features of synthetic base fluids are combined with those of a high quality lithium complex thickener. The wax-free nature of synthetic fluids and the low coefficient of traction provide excellent low temperature pumpability and very low starting and running torque. The lithium complex thickener contributes excellent adhesion, structural stability and resistance to water. The grease has a high level of chemical stability and is formulated with special additive combinations to provide excellent protection against wear, rust and corrosion at high and low temperatures.

Product	Color, Visual	NLGI Grade	Thickener Type	Viscosity of Oil, ASTM D 445 cSt at 40°C	Dropping Point, °F (°C) ASTM D 2265	Water Washout, ASTM D 1264, 79°C, % Loss
Mobil SHC Grease 460 WT	Red	1.5	Li-Complex	460	491 (255)	10

GREASES

PASSENGER VEHICLE GREASES

Mobil 1™ Mobil 1™ Synthetic Grease is an NLGI No 2 high-performance automotive grease which combines a synthetic base fluid with a lithium complex soap thickener. The thickener system provides a high dropping point, while additives impart optimum extreme-pressure properties and excellent resistance to water wash, and outstanding protection against rust and corrosion. Mobil 1 Synthetic Grease has excellent structural stability. The synthetic base oil used in Mobil 1 Synthetic Grease gives it excellent performance properties at both high and low temperatures. High structural shear stability coupled with a high performance base oil make Mobil 1 Synthetic an outstanding automotive grease. NLGI GC-LB

Product	ISO VG	Color, Visual	NLGI GC/LB	NLGI Grade	Soap Type	Viscosity of Oil, ASTM D 445		Dropping Point, °F (°C)	Water Washout ASTM D 1264, 79°C, % Loss
						cSt at 40°C	cSt at 100°C		
Mobil 1 Synthetic Grease	220	Red	2	2	Li-Complex	220	23.8	550.4 (288)	6

Mobil Grease™ Mobilgrease™ XHP 222 90

Mobil Grease™ Ronex™ MP is a premium quality multipurpose grease that can be used in a wide range of automotive and industrial applications. Ronex MP consists of a mineral oil base fluid thickened with a lithium complex soap thickener, and contains performance-enhancing additives. Ronex MP grease has excellent performance over a wide temperature range and provides moderate load carrying and extreme pressure properties. In addition, it is resistant to water and provides protection against corrosion. The grease has good oxidation and thermal stability. Ronex MP is compatible with most elastomer seal materials. NLGI GC-LB.

Product	Viscosity of Oil, ASTM D 445 cSt at 40°C	Color, Visual	NLGI Grade	Thickener Type	Dropping Point, °F (°C), ASTM D 2265
Ronex MP	115	Green	2	Li-Complex	536 (280)

Mobil Grease™ Mobil Infinitec™ 152 super-long-life grease, recommended for a wide range of automotive and industrial applications, represents a major advance in lithium-complex grease technology. Developed and patented by ExxonMobil Research and Engineering, the proprietary technology of Mobil Infinitec 152 has set a new standard for lithium-complex grease high-temperature performance. Mobil Infinitec 152 dramatically out-performs conventional lithium-complex greases in high-temperature durability tests. The exceptional lubricating properties of Mobil Infinitec 152 have also been proven in extensive tests conducted by major bearing manufacturers. NLGI GC-LB.

Product	Color, Visual	Thickener Type	Viscosity of Oil, ASTM D 445		V.I., ASTM D 2270	Dropping Point, °F (°C) ASTM D 2265	Water Washout, ASTM D 1264, at 80° C, %	Water Sprayoff, ASTM D 4049, %
			cSt at 40°C	cSt at 100°C				
Mobil Infinitec 152	Blue	Li-Complex	148	14.1	91	>572 (>300)	4	45

ANSI-AGMA INDUSTRIAL GEAR LUBRICANTS 9005-D94

R&O inhibited gear oil AGMA Lubricant No.	Viscosity range cSt at 40°C	Extreme pressure gear oil AGMA Lubricant No.	Synthetic gear oil AGMA Lubricant No.
0	28.8 to 35.2	None	0 S
1	41.4 to 50.6	None	1 S
2	61.2 to 74.8	2 EP	2 S
3	90 to 110	3 EP	3 S
4	135 to 165	4 EP	4 S
5	198 to 242	5 EP	5 S
6	288 to 352	6 EP	6 S
7, 7 Comp*	414 to 506	7 EP	7 S
8, 8 Comp*	612 to 748	8 EP	8 S
8A Comp*	900 to 1100	8A EP	None
9	1350 to 1650	9 EP	9 S
10	2880 to 3520	10 EP	10 S
11	4140 to 5060	11 EP	11 S
12	6120 to 7480	12 EP	12 S
13	190-220 at 100°C***	13 EP	13 S
14R**	428.5 to 857.0 at 100°C***	None	None
15R**	857.0 to 1714.0 at 100°C***	None	None

AGMA Lubricant No.	ISO Viscosity Grade	Mobil Product	Mobil Synthetic Product
0	32	Mobil DTE Oil Light	Mobil SHC 624
1	46	Mobil DTE Oil Medium	Mobil SHC 625
2	68	Mobil DTE Oil Heavy Medium	Mobil SHC 626
3	100	Mobil DTE Oil Heavy	Mobil SHC 627
4	150	Mobil Vacuoline 528	Mobil SHC 629
5	220	Mobil Vacuoline 533	Mobil SHC 630
6	320	Mobil Vacuoline 537	Mobil SHC 632
7	460	Mobil Vacuoline 546	Mobil SHC 634
AGMA Compounded		Mobil Product	
7 Comp*	460	Mobil 600W Super Cylinder Oil	
8 Comp*	680	Mobil Extra Hecla Super Cylinder Oil	
8A Comp*	1000	Mobil Extra Hecla Super Cylinder Oil Mineral	

AGMA Lubricant No.	ISO Viscosity Grade	Mobil Product	Mobil Synthetic Product
2 EP	68	Mobilgear 600 XP 68	None
3 EP	100	Mobilgear 600 XP 100	None
4 EP	150	Mobilgear 600 XP 150	Mobil SHC Gear 150
5 EP	220	Mobilgear 600 XP 220	Mobil SHC Gear 220
6 EP	320	Mobilgear 600 XP 320	Mobil SHC Gear 320
7 EP	460	Mobilgear 600 XP 460	Mobil SHC Gear 460
8 EP	680	Mobilgear 600 XP 680	Mobil SHC Gear 680
8A EP	1000	None	Mobil SHC Gear 1000
9 EP	1500	None	Mobil SHC Gear 1500
10 EP		Mobiltac LL	Mobil SHC Gear 3200
11 EP		None	None
12 EP		Mobiltac MM	Mobil SHC Gear 6800
13 EP		Mobiltac QQ	None
14R**		None	None
15R**		Mobiltac 325 NC, 375 NC	None

* Oils marked "Comp" are compounded with 3% to 10% fatty or synthetic fatty oils.

** Residual compounds-diluent type, commonly known as solvent cutbacks, are heavy oils containing a volatile, non-flammable diluent for ease of application. The diluent evaporates leaving a thick film of lubricant on the gear teeth. Viscosities listed are for the base compound without diluent.

*** Viscosities of AGMA Lubricant Number 13 and above are specified at 100°C (210°F) as measurement of viscosities of these heavy lubricants at 40°C (100°F) would not be practical.

VISCOSITY CONVERSION TABLE

Kinematic cSt 40 C	SUS	Engler	Redwood No. 1 Sec.	Kinematic cSt 40 C	SUS	Engler	Redwood No. 1 Sec.	Kinematic cSt 40 C	SUS	Engler	Redwood No. 1 Sec.
2	32.6	1.14	30.8	46	214	6.15	190	240	1112	32	990
3	36.0	1.22	33.2	50	233	6.65	207	250	1159	33	1030
4	39.1	1.31	35.8	55	256	7.25	228	260	1205	34	1070
5	42.5	1.40	38.4	60	279	7.9	248	270	1251	36	1110
6	45.7	1.48	41.0	65	302	8.6	268	280	1297	37	1150
7	49.0	1.56	43.7	70	325	9.25	286	290	1344	38	1190
8	52.0	1.65	46.5	75	349	9.85	307	300	1390	40	1230
9	55.7	1.74	49.2	80	372	10.5	329	315	1460	41	1300
10	59.0	1.83	52.1	85	395	11.2	349	330	1529	43	1350
11	62.5	1.92	55.2	90	418	11.8	370	350	1622	46	1440
12	66.2	2.02	58.4	95	442	12.5	390	370	1715	49	1520
13	70.0	2.12	61.6	100	465	13.2	410	390	1807	51	1600
15	77.5	2.32	68.2	110	511	14.5	450	410	1900	54	1690
17	85.5	2.55	75.2	120	558	15.8	490	430	1990	57	1770
19	94	2.77	82.8	130	605	17.1	530	450	2090	59	1850
21	100	3.00	90.4	140	649	18.4	570	470	2180	62	1930
23	111	3.23	98	150	695	19.7	620	490	2270	64	2010
25	120	3.46	106	160	742	21.0	660	500	2320	66	2050
28	133	3.83	117	170	788	22.5	700	550	2540	72	2260
30	142	4.09	125	180	834	24.0	740	600	2780	79	2460
33	155	4.46	137	190	881	25.0	780	650	3010	86	2670
35	164	4.71	145	200	927	26.0	820	700	3240	92	2880
38	178	5.10	157	210	973	28.0	860	750	3470	99	3080
40	187	5.35	166	220	1020	29.0	900	800	3700	105	3280
43	200	5.75	178	230	1066	30.0	940				

DEGREES API CORRESPONDING TO SPECIFIC GRAVITIES AT 60/60°F AND POUNDS PER GALLON

Degrees API	Specific Gravity (S.G.)	Pounds Gallons	Degrees API	Specific Gravity (S.G.)	Pounds Gallons	Degrees API	Specific Gravity (S.G.)	Pounds Gallons
1.36	1.065	8.870	14.4	0.970	8.078	30.2	0.875	7.286
1.99	1.060	8.829	15.5	0.965	8.036	31.1	0.870	7.244
2.62	1.055	8.787	15.9	0.960	7.995	32.1	0.865	7.203
3.26	1.050	8.745	16.7	0.955	7.953	33.0	0.860	7.161
3.91	1.045	8.704	17.5	0.950	7.911	34.0	0.855	7.119
4.56	1.040	8.662	18.2	0.945	7.870	35.0	0.850	7.078
5.21	1.035	8.620	19.0	0.940	7.828	36.0	0.845	7.036
5.88	1.030	8.578	19.8	0.935	7.786	36.9	0.840	6.994
6.55	1.025	8.537	20.6	0.930	7.745	38.0	0.835	6.952
7.23	1.020	8.495	21.5	0.925	7.703	39.0	0.830	6.911
7.91	1.015	8.453	22.3	0.920	7.661	40.0	0.825	6.869
8.60	1.010	8.412	23.1	0.915	7.620	41.0	0.820	6.827
9.30	1.005	8.370	24.0	0.910	7.578	42.1	0.815	6.786
10.00	1.000	8.328	24.8	0.905	7.536	43.2	0.810	6.744
10.70	0.995	8.287	25.7	0.900	7.494	44.3	0.805	6.702
11.4	0.990	8.245	26.6	0.895	7.453	45.4	0.800	6.661
12.2	0.985	8.203	27.5	0.890	7.411			
12.9	0.980	8.162	28.4	0.885	7.369			
13.6	0.975	8.120	29.3	0.880	7.328			

ISO VISCOSITY CLASSIFICATION SYSTEM

ISO Viscosity Grades	Mid-Point cSt @ 40°C	Viscosity Ranges cSt @ 40°C	
		Minimum	Maximum
2	2.2	1.98	2.42
3	3.2	2.88	3.52
5	4.6	4.14	5.06
7	6.8	6.12	7.48
10	10	9.00	11.0
15	15	13.5	16.5
22	22	19.8	24.2
32	32	28.8	35.2
46	46	41.4	50.6
68	68	61.2	74.8
100	100	90.0	110
150	150	135	165
220	220	198	242
320	320	288	352
460	460	414	506
680	680	612	748
1000	1000	900	1100
1500	1500	1350	1650

**GREASE CONSISTENCY CLASSIFICATION: NATIONAL LUBRICATING GREASE INSTITUTE (NLGI)
AMERICAN STANDARD LUBRICATING GREASE CLASSIFICATION**

GRADE	60-STROKE WORKED PENETRATION AT 77°F (25°C)
NLGI No. 000	445-475
NLGI No. 00	400-430
NLGI No. 0	355-385
NLGI No. 1	310-340
NLGI No. 2	265-295
NLGI No. 3	220-250
NLGI No. 4	175-205
NLGI No. 5	130-160
NLGI No. 6	85-115

The grades are defined as ranges of the values of the 60-stroke worked penetration, in tenths of millimeters, as determined by the ASTM Designation D 217, "Cone Penetration of Lubricating Grease."

APPENDICIES

ISO 4406 – OIL CLEANLINESS BY PARTICLE COUNTING

Cleanliness Code	Particles/ml	
	More Than	Up To
> 28	2500000	
28	1300000	2500000
27	640000	130000
26	320000	640000
25	160000	320000
24	80000	160000
23	40000	80000
22	20000	40000
21	10000	20000
20	5000	10000
19	2500	5000
18	1300	2500
17	640	1300
16	320	640
15	160	320
14	80	160
13	40	80
12	20	40
11	10	20
10	5	10
9	2,5	5
8	1,3	2,5
7	0,64	1,3
6	0,32	0,64
5	0,16	0,32
4	0,08	0,16
3	0,04	0,08
2	0,02	0,04
1	0,01	0,02
0	0	0,01

SAE VISCOSITY GRADES FOR ENGINE OILS

SAE Viscosity Grade	Low-Temperature (C°)	Low-Temperature (C°)	Low-Shear-Rate Kinematic Viscosity ⁽⁵⁾ (cSt)	Low-Shear-Rate Kinematic Viscosity ⁽⁵⁾ (cSt)	High-Shear-Rate Viscosity ⁽⁶⁾ (cP)
	Cranking Viscosity ⁽³⁾ (cP) Max	Pumping Viscosity ⁽⁴⁾ (cP) Max with No Yield Stress ⁽⁴⁾	at 100°C Min	at 100°C Max	at 150°C Min
0W	6,200 at -35	60,000 at -40	3.8	—	—
5W	6,600 at -30	60,000 at -35	3.8	—	—
10W	7,000 at -25	60,000 at -30	4.1	—	—
15W	7,000 at -20	60,000 at -25	5.6	—	—
20W	9,500 at -15	60,000 at -20	5.6	—	—
25W	13,000 at -10	60,000 at -15	9.3	—	—
20	—	—	5.6	< 9.3	2.6
30	—	—	9.3	< 12.5	2.9
40	—	—	12.5	< 16.3	2.9 ⁽⁷⁾
40	—	—	12.5	< 16.3	3.7 ⁽⁸⁾
50	—	—	16.3	< 21.9	3.7
60	—	—	21.9	< 26.1	3.7

(1) Note: 1cP = 1mPa*s; 1cSt = 1mm²/s

(2) All values are critical specifications as defined by ASTM D 3244

(3) ASTM D 5293

(4) ASTM D 4684; note that the presence of any yield stress detectable by this method constitutes a failure regardless of viscosity

(5) ASTM D 445

(6) ASTM D 4683, CEC L-36-A-90 (ASTM D 4741), or ASTM D 5481

(7) 0W-40, 5W-40, and 10W-40

(8) 15W-40, 20W-40, 25W-40, and 40

SAE J306 VISCOSITY GRADES FOR GEAR OILS

SAE Viscosity Grade	Maximum Temperature for BF Viscosity 150,000 cP	Kin Viscosity, 100°C	
		min. ⁽¹⁾	max.
70W	-55 C	4.1	—
75W	-40 C	4.1	—
80W	-26 C	7.0	—
85W	-12 C	11.0	—
80	—	7.0	<11.0
85	—	11.0	<13.5
90	—	13.5	<18.5
110	—	18.5	<24.0
140	—	24.0	<32.5
190	—	32.5	<41.0
250	—	41.0	—

⁽¹⁾Limits must also be met after testing in CEC L-45-T-93 Method C (20 hours)

TEMPERATURE CONVERSION TABLE

$^{\circ}\text{C} = (^{\circ}\text{F} - 32) * (5/9)$

$^{\circ}\text{F} = ^{\circ}\text{C} (9/5) + 32$

°C	°F	°C	°F	°C	°F	°C	°F
-100	-148.0	-34	-29.2	32	89.6	98	208.4
-98	-144.4	-32	-25.6	34	93.2	100	212
-96	-140.8	-30	-22.0	36	96.8	105	221
-94	-137.2	-28	-18.4	38	100.4	110	230
-92	-133.6	-26	-14.8	40	104.0	115	239
-90	-130.0	-24	-11.2	42	107.6	120	248
-88	-126.4	-22	-7.6	44	111.2	125	257
-86	-122.8	-20	-4.0	46	114.8	130	266
-84	-119.2	-18	-0.4	48	118.4	135	275
-82	-115.6	-16	3.2	50	122.0	140	284
-80	-112.0	-14	6.8	52	125.6	145	293
-78	-108.4	-12	10.4	54	129.2	150	302
-76	-104.8	-10	14.0	56	132.8	155	311
-74	-101.2	-8	17.6	58	136.4	160	320
-72	-97.6	-6	21.2	60	140.0	165	329
-70	-94.0	-4	24.8	62	143.6	170	338
-68	-90.4	-2	28.4	64	147.2	175	347
-66	-86.8	0	32.0	66	150.8	180	356
-64	-83.2	2	35.6	68	154.4	185	365
-62	-79.6	4	39.2	70	158.0	190	374
-60	-76.0	6	42.8	72	161.6	195	383
-58	-72.4	8	46.4	74	165.2	200	392
-56	-68.8	10	50.0	76	168.8	205	401
-54	-65.2	12	53.6	78	172.4	210	410
-52	-61.6	14	57.2	80	176.0	215	419
-50	-58.0	16	60.8	82	179.6	220	428
-48	-54.4	18	64.4	84	183.2	225	437
-46	-50.8	20	68.0	86	186.8	230	446
-44	-47.2	22	71.6	88	190.4	235	455
-42	-43.6	24	75.2	90	194.0	240	464
-40	-40.0	26	78.8	92	197.6	245	473
-38	-36.4	28	82.4	94	201.2	250	482
-36	-32.8	30	86.0	96	204.8	255	491

TEMPERATURE CONVERSION TABLE (CONTINUED)

$$^{\circ}\text{C} = (^{\circ}\text{F} - 32) * (5/9)$$

$$^{\circ}\text{F} = ^{\circ}\text{C} (9/5) + 32$$

$^{\circ}\text{C}$	$^{\circ}\text{F}$	$^{\circ}\text{C}$	$^{\circ}\text{F}$	$^{\circ}\text{C}$	$^{\circ}\text{F}$	$^{\circ}\text{C}$	$^{\circ}\text{F}$
260	500	425	797	590	1094	755	1391
265	509	430	806	595	1103	760	1400
270	518	435	815	600	1112	765	1409
275	527	440	824	605	1121	770	1418
280	536	445	833	610	1130	775	1427
285	545	450	842	615	1139	780	1436
290	554	455	851	620	1148	785	1445
295	563	460	860	625	1157	790	1454
300	572	465	869	630	1166	795	1463
305	581	470	878	635	1175	800	1472
310	590	475	887	640	1184	805	1481
315	599	480	896	645	1193	810	1490
320	608	485	905	650	1202	815	1499
325	617	490	914	655	1211	820	1508
330	626	495	923	660	1220	825	1517
335	635	500	932	665	1229	830	1526
340	644	505	941	670	1238	835	1535
345	653	510	950	675	1247	840	1544
350	662	515	959	680	1256	845	1553
355	671	520	968	685	1265	850	1562
360	680	525	977	690	1274	855	1571
365	689	530	986	695	1283	860	1580
370	698	535	995	700	1292	865	1589
375	707	540	1004	705	1301	870	1598
380	716	545	1013	710	1310	875	1607
385	725	550	1022	715	1319	880	1616
390	734	555	1031	720	1328	885	1625
395	743	560	1040	725	1337	890	1634
400	752	565	1049	730	1346	895	1643
405	761	570	1058	735	1355	900	1652
410	770	575	1067	740	1364	905	1661
415	779	580	1076	745	1373	910	1670
420	788	585	1085	750	1382	915	1679

Mobil ServSM

Lubricant Analysis

UNDERSTANDING OIL ANALYSIS

VISCOSITY

Probably the most important single property of a lubricating oil. It is a major factor in the development of the load carrying ability of an oil. It is defined as resistance to flow at 40 degrees Centigrade and typically reported in Centistokes (cSt).

WEAR METALS

The presence of these metals can indicate a wear problem on a microscopic level before the problem can be detected by conventional means. The existence of a wear problem is determined not only by absolute values of metals, but more importantly by a relative increase or trend in one or more of these metals.

METAL

Iron
Chromium
Lead
Copper
Tin
Aluminum
Nickel
Silver
Manganese

SOURCES

Cylinders, Gears, Rings, Crankshafts, Liners, Bearings, Rust
Rings, Bearing and Liner Plating
Bearing Overlays
Hydraulic Pumps, Bearing Cages, Bushings, Bronze Components
Bearing Plating, Compressors
Pistons, Bearing and Pump, Blower and Compressor Impellers
Valves
Bearing and Bushing Plating
Trace Element in Gas Turbine Components

CONTAMINANTS

These elements can be an indicator of contamination. The combination of contaminant and wear metals can indicate a harmful machine operating condition.

CONTAMINANT

Silicon
Boron
Sodium
Potassium
Acid
Oxidation
Water
Glycol
Fuel
Soot
Chlorine

SOURCES

Abrasive Dirt, Sealant, Defoamant
Anti-freeze, Oil Additive
Anti-freeze, Oil Additive
Anti-freeze, Oil Additive
Oil Degradation (TAN)
Thermal Degradation of Oil
Anti-freeze, Process Water, Condensation
Anti-freeze
Fuel System
Incomplete Combustion, Blow-by
Land Fill Gas, Sea Water

ADDITIVES

A chemical substance added to oil to impart or improve certain properties.

ADDITIVE

Magnesium
Calcium
Barium
Phosphorus
Zinc
Molybdenum

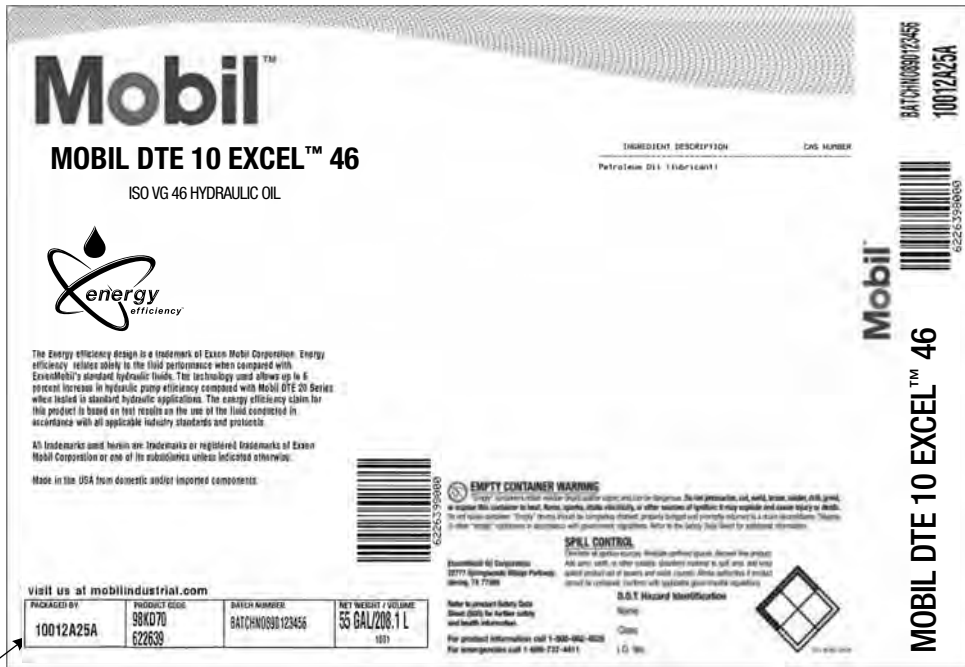
FUNCTIONS

Dispersant/Detergent (TBN)
Dispersant/Detergent (TBN)
Dispersant/Detergent
Antiwear
Antiwear
Antiwear

For further information contact your Mobil representative or go to signumoilanalysis.com.

MANUFACTURE INTERPRETATION KEY – EXAMPLE OF DRUM LABEL

Date of Manufacture code interpretation



Manufacturing Location Information:
 The first three characters indicate the manufacturing location
 The next two digits reflect the year of manufacture
 The next letter defines the month manufacture (see table)
 The next two digits reflect the day of the fill
 The last character is a plant filling indicator

Code	Month	Code	Month	Code	Month
A	Jan	E	May	J	Sept
B	Feb	F	June	K	Oct
C	Mar	G	July	L	Nov
D	Apr	H	Aug	M	Dec

Example:

11012B09A - 110 = Manufacturing Location, 12 = year, B = Month (Feb) , 09 = Day, A = Plant filling indicator

ALPHABETICAL INDEX OF PRODUCTS

Please Note: Products are alphabetized by first letter that appears in **BOLD** text

PRODUCT	PAGE
Mobil Aero™ HF Series	80
Mobil AGL™	79
Mobil Almo™ 500 Series	45
Mobil ATF™ D/M	70
Mobil ATF™ Type F	70
Mobil Aviation™ Grease SHC 100	79
Exxon™ Aviation Oil Elite 20W-50	82
Mobil Avrex™ M Turbo 201/1010	81
Mobil Avrex™ S Turbo 256	81
Beacon™ 325	93
Mobil Centaur™ Moly Series	86
Mobil Centaur™ XHP 460 Series	91
Mobil Cylinder™ Oils	21
Mobil Delvac 1™ ESP 5W-40	56
Mobil Delvac™ 1200 Series	57
Mobil Delvac™ 1300 Super 10W-30 and 15W-40	56
Mobil Delvac™ 1600 Monograde Series	57
Mobil Delvac™ Elite	56
Mobil Delvac™ Extended Life Coolant/Antifreeze	64
Mobil Delvac™ MX F2 15W-40	57
Mobil Delvac™ Synthetic ATF	58
Mobil Delvac™ Synthetic Gear Oil 75W-90 and 80W-140	58
Mobil Delvac™ Synthetic Transmission Fluid 50	58
Mobil Delvac™ Synthetic Transmission Fluid Arctic	58
Mobil Delvac™ Xtreme Grease	86
Mobil Dexron® -VI ATF	70
Mobil Diol™ 9 RD Series	57
Mobil DTE 10 Excel™ Series	34
Mobil DTE™ 20 Series	34
Mobil DTE™ 700 Series	52
Mobil DTE™ 732 M	52
Mobil DTE™ 800 Series	52
Mobil DTE™ 932 GT	52

ALPHABETICAL INDEX OF PRODUCTS

Please Note: Products are alphabetized by first letter that appears in **BOLD** text

PRODUCT	PAGE
Mobil DTE Excel™ Series	35
Mobil DTE™ FM Series	24
Mobil DTE™ Oil 205	21
Mobil DTE™ Oil Named Series	19
Mobil DTE™ PM Ashless	44
Mobil Dynagear™ Series	86
Mobil DTE™ PM Series	44
Mobil EAL™ 224H	38
Mobil EAL Arctic™ Series	46
Mobil EAL EnviroSyn™ H Series	38
Mobil™ Fleet 15W-40	56
Gargoyle Arctic™ 155 and 300	46
Mobil Gargoyle Arctic SHC™ 200 Series	46
Mobil Glygoyle™ 22	46
Mobil Glygoyle™ Series	31
Mobil Glygoyle™ Numbered Series	18
Mobil™ Heavy Duty SCA Precharged Coolant/Antifreeze	64
Mobil™ Hydraulic 10W	58
Exxon HyJet™ IV-A Plus	80
Exxon HyJet™ V	80
Mobil Infinitec™ 152	95
Mobil Jet™ Oil 254	81
Mobil Jet™ Oil 387	81
Mobil Jet™ Oil II	81
Mobil™ Multi-Vehicle ATF	70
Nuto™ H Series	36
Nyvac™ FR 200D	39
Mobil 1™	67
Mobil 1™ 0W-20 and 0W-30 Advanced Fuel Economy	67
Mobil 1™ ESP Formula 5W-30	68
Mobil 1™ ESP Formula M 5W-40	68
Mobil 1™ Extended Performance 5W-20, 5W-30, and 10W-30	68
Mobil 1™ High Mileage Oils	68

ALPHABETICAL INDEX OF PRODUCTS

Please Note: Products are alphabetized by first letter that appears in **BOLD** text

PRODUCT	PAGE
Mobil 1™ Motorcycle Oils	71
Mobil 1 Racing™ Oils	69
Mobil 1™ Synthetic ATF	70
Mobil 1™ Synthetic Gear Lubricant LS 75W-90	70
Mobil 1™ Synthetic Gear Lubricant LS 75W-140	70
Mobil 1™ Synthetic Grease	95
Mobil 1™ Turbo Diesel Truck 5W-40	68
Mobilarma™ 200, 500, and 700 Series	50
Mobilcut™ 100	41
Mobilcut™ 140	41
Mobilcut™ 230 and 250	41
Mobilcut™ 320 and 350	41
Mobilfluid™ 424	61
Mobilfluid™ LT	61
Mobilgard™ 12 Series	74
Mobilgard™ 300	73
Mobilgard™ 409 NC	74
Mobilgard™ 450 NC	57
Mobilgard™ 560 VS	73
Mobilgard™ ADL Series	74
Mobilgard™ M30 Series	74
Mobilgard™ M40 Series (M440)	75
Mobilgard™ M50	75
Mobilgear™ 600 XP Series	29
Mobilgear™ MS Series (formerly Mobil Mist Lube)	42
Mobilgear SHC™ MT 68	76
Mobilgear SHC™ XMP Series	31
Mobilgrease™ 28	79
Mobilgrease™ 33	79
Mobilgrease™ CM Series	86
Mobilgrease™ FM Series	89
Mobilgrease™ HT Series	94
Mobilgrease™ XHP 005	90

ALPHABETICAL INDEX OF PRODUCTS

Please Note: Products are alphabetized by first letter that appears in **BOLD** text

PRODUCT	PAGE
Mobilgrease™ XHP 220 Series	90
Mobilgrease™ XHP 222	90
Mobilgrease™ XHP Mine Series	86
Mobilgrease™ XHP 460 Series	90
Mobilgrease™ XTC	87
Mobilith SHC™ 007	90
Mobilith SHC™ 100	90
Mobilith SHC™ PM	92
Mobilith SHC™ Series	90
Mobilmet™ 420 Series	40
Mobilmet™ 447	40
Mobilmet™ 760 Series	40
Mobilmet™ Omega	40
Mobiltac™ 325 NC, 375 NC	32
Mobiltac™ Double Letter Series	32
Mobiltemp™ Series	87
Mobiltemp SHC™ 32	87
Mobiltherm™ 43	33
Mobiltherm™ 603	33
Mobiltrans™ AST (All Season Transmission)	62
Mobiltrans™ HD 10W, 30, 50, and 60	63
Mobilube™ HD 80W-140	61
Mobilube™ HD LS 80W-90	61
Mobilube™ HD Plus 80W-90 and 85W-140	61
Mobilube™ XFD 50 and 60	62
Mobilux™ EP 023	91
Mobilux™ EP 111	87
Mobilux™ EP Series	91
Mobil Pegasus™1	26
Mobil Pegasus™ 505 Series	26
Mobil Pegasus™ 605 (600 Series)	27
Mobil Pegasus™ 610 (600 Series)	27
Mobil Pegasus™ 710	27

ALPHABETICAL INDEX OF PRODUCTS

Please Note: Products are alphabetized by first letter that appears in **BOLD** text

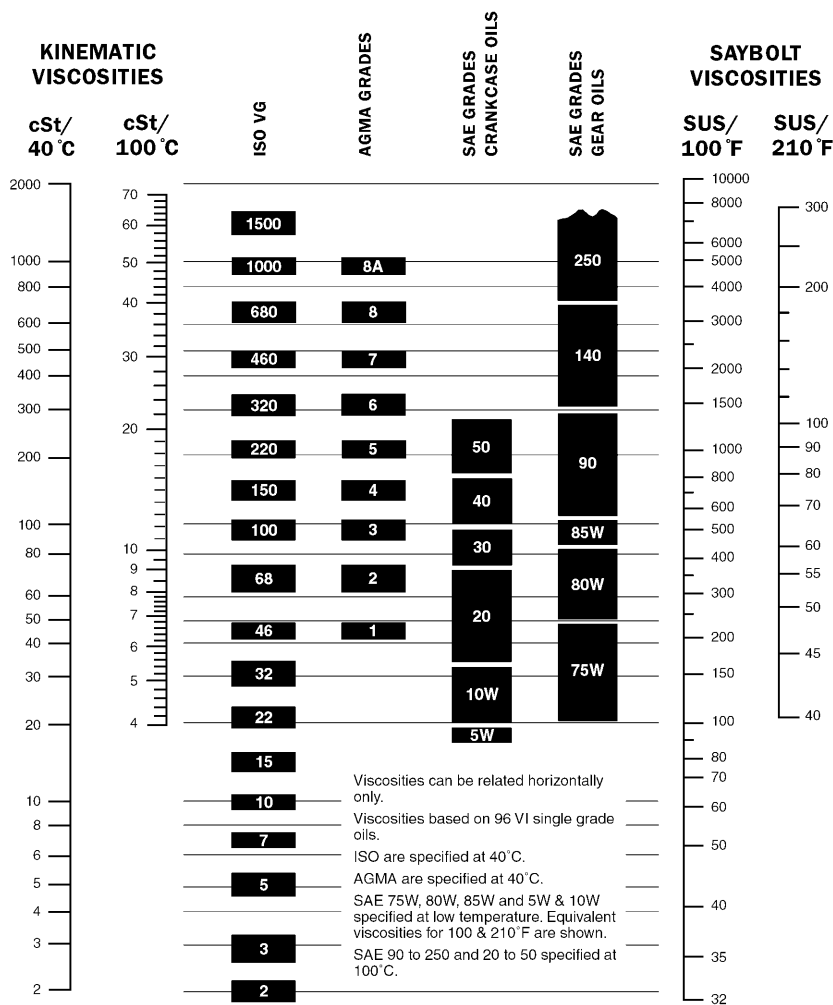
PRODUCT	PAGE
Mobil Pegasus™ 805	26
Mobil Pegasus™ 805 Super	27
Mobil Pegasus™ 1005	26
Mobil Pegasus™ Special CF	28
Mobil Permazone™ Coolant/Antifreeze	64
Mobil Polyrex™ EM	88
Mobil Polyrex™ EP 2	91
Pyrogard™ 53	39
Mobil Rarus™ 427	22
Mobil Rarus™ 800 Series	22
Mobil Rarus SHC™ 1020 Series	22
Ronex™ MP	95
Mobil™ Sawguide Oils	43
Mobil SHC™ 500 Series	34
Mobil SHC™ 600 Series	18, 29
Mobil SHC™ 800 Series	51
Mobil SHC Cibus™ Series	24
Mobil SHC Cibus™ 32 HT	24
Mobil SHC™ Gear OH Series	62
Mobil SHC™ Gear Series (ISO VG 150-1000)	30
Mobil SHC™ Gear 22M and 46M	32
Mobil SHC™ Gear 1500, 3200, 6800	30
Mobil SHC™ Grease 460 WT	94
Mobil SHC™ Grease 101 and 102 EAL	88
Mobil SHC Pegasus™ Series	26
Mobil SHC™ PF 462	93
Mobil SHC™ PM Series	44
Mobil SHC Polyrex™ Series	89
Mobil™ SM 16M	24
Socony™ Oven Conveyer Lubricant	43
Spartan™ EP	29
Mobil Special™	69
Mobil Super™	69

ALPHABETICAL INDEX OF PRODUCTS

Please Note: Products are alphabetized by first letter that appears in **BOLD** text

PRODUCT	PAGE
Mobil Super™ High Mileage	69
Mobil Super™ Synthetic	69
Mobil™ Synthetic Oven Lube 1090	43
Synturion™ 6	43
Mobil™ System Cleaner	43
Teresstic™	19
Mobil Thermrex™ Series	45
Mobil™ Turbo 319A-2	82
Unirex™ N	88
Unirex™ S 2	93
Univis™ HVI	35
Univis™ N Series	35
Univolt™ N 61 B	51
Mobil Vactra™ Oil Named Series	19
Mobil Vactra™ Oil Numbered Series	53
Mobil Vacuoline™ 100 Series	20
Mobil Vacuoline™ 500 Series	18
Mobil Vacuoline™ 1400 Series	53
Mobil Vaprotec™ Light	50
Mobil Velocite™ Oil Numbered Series	51
Mobil Zerice™ S Series	46

VISCOSITY CLASSIFICATION EQUIVALENTS



ISO VISCOSITY CLASSIFICATION SYSTEM

Many petroleum products are graded according to the ISO Viscosity Classification System, approved by the International Standards Organization (ISO). Each ISO viscosity grade number corresponds to the mid-point of a viscosity range expressed in centistokes (cSt) at 40°C. For example, a lubricant with an ISO grade of 32 has a viscosity within the range of 28.8–35.2, the midpoint of which is 32.

Rule-of-Thumb: The comparable ISO grade of a given product whose viscosity in SUS at 100°F is known can be determined by using the following conversion formula:

$$\text{SUS @ 100°F} \div 5 \approx \text{cSt @ 40°C}$$

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