Mobil
Industrial Lubricants

Mobil Industrial
Product Guide

Typical Properties quoted are those typical of normal production 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. The information contained herein is subject to change without notice. For more information or current specifications contact your local ExxonMobil distributor or representative or visit www.exxonmobil.com. All products contained in this product guide may not be available locally.

Health and Safety

Based on available information, this product is not expected to produce adverse effects on health when used for the intended application and the recommendations provided in the Safety Data Sheet (SDS) are followed. SDS's are available via the ExxonMobil website. This product should not be used for purposes other than its intended use. If disposing of used product, take care to protect the environment.

The world is advancing rapidly and business success is about keeping pace. With our technologically advanced industrial lubricants and proven record of innovative solutions, Mobil makes it easy for you to stay in the race.

Tailored to deliver superior performance for a wide range of industrial applications, Mobil branded lubricants are supported by proprietary programs and a rich heritage of outstanding technical expertise.

In this edition of the Mobil Industrial Lubricants Product Guide, you can find a showcase of our core industrial lubricants. Each product or series comes with a brief description, key features and benefits, and application avenues in simple, comprehensive terms to facilitate your purchasing process.

We have provided reference charts in the appendix section to keep important information at your fingertips.

For more information, visit mobilindustrial.com today.

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Circulating Oils

Mobil SHC™ PM Series

Mobil SHC PM lubricants represent a technological advancement in paper machine lubrication. Their excellent performance capabilities in wear protection, oxidation stability, chemical stability, rust and corrosion protection, colour stability and filterability prolong maintenance service intervals, improve machine performance and increase production capacity. They are engineered to provide exceptional lubrication characteristics unattainable with conventional premium mineral oil-based fluids.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity
- Optimum gear and bearing performance
- Reliable flow and lubrication for easy startup, even at low temperatures
- Keeps Lubricant lines and flow control mechanisms free of sludge and deposit formations
- Easy removal of moisture reduces formation of deposits and emulsions
- Reduced energy consumption

Applications:

- Lubrication of severe duty industrial paper machine circulating systems
- Circulation systems such as calendar rolls operating over a wide temperature range
- Systems that must be started and brought online quickly
- Circulation systems' lubricating gears and bearings

Product Name	ISO VG
Mobil SHC PM 150	150
Mobil SHC PM 220	220
Mobil SHC PM 320	320

Mobil DTE™ PM Series

Mobil DTE PM lubricants are high quality, high performance oils designed for demanding industrial paper machine circulating systems. They have proven performance capabilities in modern high output paper machine lubrication. Their excellent performance properties in wear protection, oxidation stability, chemical stability, rust and corrosion protection, colour stability and filterability extend maintenance service intervals, improve machine performance and increase production capacity.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity
- Optimum gear and bearing performance
- Reduced formation of deposits and emulsions

Applications:

- Lubrication of industrial paper machine circulating systems
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- Systems that must be started and brought online quickly
- Circulation systems' lubricating gears and bearings

Product Name	ISO VG
Mobil DTE PM 220	220

Mobil SHC™ 600 Series

The Mobil SHC 600 Series lubricants are exceptional performance 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. The Mobil SHC 600 Series of products feature excellent low temperature properties, as well as improved air release performance in the lower viscosity grades.

The Mobil SHC 600 Series of lubricants have low traction coefficients relative to mineral oils, derived from the molecular structure of the base stocks used. This results in low fluid friction in the load zone of non-conforming surfaces such as gears and rolling contact bearings. Low fluid friction produces lower operating temperatures and improved gear efficiency, which translates into reduced power consumption. The Mobil SHC 600 Series products have demonstrated up to 3.6% improvement in energy efficiency in controlled laboratory testing(*).

Advantages and Potential Benefits:

The development of the Mobil SHC 600 Series was developed by close contacts between our scientists and application specialists with key Original Equipment Manufacturers (OEMs) to ensure that the products provide exceptional performance in the continually evolving industrial equipment designs.

- Superb high temperature thermal/oxidation resistance, which helps extend equipment high temperature operating capability and increase oil life and reducing maintenance costs
- High Viscosity Index and absence of wax, maintains viscosity and film thickness at high temperatures, which helps enable exceptional low temperature performance, including start-up
- Low traction coefficient, helps reduce friction and increase efficiency in sliding mechanisms such as gearing, with potential for reduced power consumption and lower steady-state operating temperatures

Applications:

- Mobil SHC 600 Series lubricants are recommended for use in a wide variety of gear and bearing applications where high or low temperatures are encountered or where operating temperatures or bulk oil temperatures are such that conventional lubricants give unsatisfactory life, or where improved efficiency is desired. Filled for life gearboxes, especially high ratio/low-efficiency worm gears
- Remotely located gearboxes, where oil change-out is difficult
- Low temperature applications, such as ski lifts where seasonal oil changes can be avoided
- Mixer roll bearings and roll neck bearings where high temperatures are encountered
- The Mobil SHC 626, 627, 629 and 630 are suitable for Oil Flooded Rotary Screw Compressors compressing natural gas, field gas gathering, CO2 and other process gasses used in the natural gas industry
- The Mobil SHC 629, 630, 632, 634, 636, and 639 are approved by Siemens AG for use in Flender gearboxes

Product Name	ISO VG
Mobil SHC 624	32
Mobil SHC 626	68
Mobil SHC 627	100
Mobil SHC 629	150
Mobil SHC 630	220
Mobil SHC 632	320
Mobil SHC 634	460
Mobil SHC 636	680
Mobil SHC 639	1000

(*) Energy efficiency relates solely to the performance of the Mobil SHC 600 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% 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 Glygoyle™ Series

Mobil Glygoyle 22 and 30 oils are polyalkyleneglycol-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.

Mobil Glygoyle 22 and 30 have very high viscosity indices and, being wax-free, they have extremely low pour points. Their coefficients of friction and traction (for example, in non-conforming gear or bearing contacts) are lower than for mineral oils. These exceptional lubricity characteristics help deliver lower operating temperatures in many applications.

They are recommended for use by major plastic calendar, paper machine bearing, compressor and gear manufacturers, and are the products of choice for many severe service applications.

Advantages and Potential Benefits:

- Superb thermal and oxidative stability, and resistance to sludge and deposit formation which extends lubricant life, increased production, less scheduled and unscheduled downtime
- Low coefficients of traction and friction, reducing operating temperatures, greater equipment efficiency, and potential for reduced power consumption and long seal life
- Excellent low-temperature fluidity, enables quicker warm-up at low ambient temperature resulting in reduced power consumption and smoother running
- Reduced gear tooth wear at high temperatures for both steel-on-steel and steel-on-bronze metallurgies, reducing operating costs due to less wear, reduced operating temperature and smoother running
- Reduced absorption and viscosity reduction with pressurised hydrocarbon gases, thereby Improving film protection and long life for natural gas compressors

Applications:

Mobil Glygoyle lubricants are recommended for the most severe conditions in all types of plain and anti-friction bearings and industrial enclosed gears up to a bulk oil temperature of 200° C. Specific applications include:

- High temperature paper machine bearings
- Industrial enclosed gears – spur, bevel and worm gearing
- Reciprocating and rotary air, natural gas, CO2 and other process gasses

Product Name	ISO VG
Mobil Glygoyle 22	150
Mobil Glygoyle 30	220

Mobil DTE™ Oil Named Series

Mobil DTE Oil Named lubricants are premium performance circulating oils, designed for applications including steam and hydro turbine sets and other systems where long lubricant service life is required. They are formulated from highly refined base stocks and an additive system to provide an extremely high level of chemical and thermal stability, rapid and complete separation from water and high resistance to emulsification. As the lubricants of choice for many users, they have a reputation for long life, excellent equipment protection and outstanding versatility in the wide variety of industrial applications.

Refer to Turbine Oils category for more information on superior Mobil DTE turbine lubricant family of products.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity
- Extended equipment service intervals reduces maintenance costs
- Reduced pump cavitation and noisy, erratic operation
- Improved operating efficiency

Applications:

- Land-based and marine steam turbines, hydro turbines and some gas turbine circulation systems, including pumps, valves and other ancillary equipment
- Continuous service in plain and roller bearings and parallel shaft gears
- Turbines with oil supplied by splash, bath, ring oiling or other mechanical means
- Moderate severity hydraulic pumps
- Compressors and vacuum pumps handling air and inert gases with discharge temperatures not exceeding 150ºC

Product Name	ISO VG
Mobil DTE Oil Light	32
Mobil DTE Oil Medium	46
Mobil DTE Oil Heavy Medium	68
Mobil DTE Oil Heavy	100

Mobil Vacuoline™ 500 Series

The Mobil Vacuoline 500 lubricants are suitable for a wide range of industrial equipment. They are high performance heavy duty circulating oils designed for the demands of No-Twist-Rod mills. Their all-round performance makes them excellent for circulation systems lubricating gears and bearings.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity
- Improved operating efficiency
- Multi-purpose capability reduces inventory costs and lowers chances of misapplication

Applications:

- No-Twist-Rod mills
- Moderate duty spur, bevel, helical and herringbone gear units
- Circulating systems
- Mobil Vacuoline 525, 528, 533 can also be used in hydraulic systems employing gears, vanes, radial and axial piston pumps where high viscosity anti-wear hydraulic fluids are required
- Certain compressors and vacuum pumps handling air and inert gases with discharge temperatures not exceeding 150ºC; unsuitable for breathing air compressors

Product Name	ISO VG
Mobil Vacuoline 525	–
Mobil Vacuoline 528	150
Mobil Vacuoline 533	220
Mobil Vacuoline 537	320
Mobil Vacuoline 546	460

Circulating Oils Typical Properties

Product Name	Specific Gravity	Pour °C	Flash °C	Viscosity		V.I.	ISO VG
				cSt at 40°C	cSt at 100°C		
Mobil SHC PM 150	0.86	-39	220	158	18.9	124	150
Mobil SHC PM 220	0.86	-36	220	225	25.6	127	220
Mobil SHC PM 320	0.87	-33	220	325	34.7	130	320
Mobil DTE PM 220	0.89	-6	260	220	19.0	95	220
Mobil Glygoyle 22	1.01	-41	229	177	25.1	175	150
Mobil Glygoyle 30	1.01	-41	221	224	30.9	181	220
Mobil SHC 624	0.85	-57	236	32	6.3	148	32
Mobil SHC 626	0.86	-51	225	68	11.6	165	68
Mobil SHC 627	0.86	-45	235	100	15.3	162	100
Mobil SHC 629	0.86	-42	220	150	21.1	166	150
Mobil SHC 630	0.87	-42	220	220	28.5	169	220
Mobil SHC 632	0.87	-42	225	320	38.5	172	320
Mobil SHC 634	0.87	-39	228	460	50.7	174	460
Mobil SHC 636	0.87	-39	225	680	69.0	181	680
Mobil SHC 639	0.87	-33	222	1000	98.8	184	1000
Mobil DTE Oil Light	0.85	-18	218	31	5.5	102	32
Mobil DTE Oil Medium	0.86	-15	221	45	6.9	98	46
Mobil DTE Oil Heavy Medium	0.87	-15	223	65	8.7	95	68
Mobil DTE Oil Heavy	0.88	-15	237	95	10.9	92	100
Mobil Vacuoline 525	0.88	-24	264	89	10.7	99	-
Mobil Vacuoline 528	0.89	-21	272	146	14.4	96	150
Mobil Vacuoline 533	0.89	-15	284	215	18.8	96	220
Mobil Vacuoline 537	0.90	-12	288	309	24.4	96	320
Mobil Vacuoline 546	0.90	-12	286	453	29.4	96	460

Compressor Oils

Mobil Rarus SHC™ 1020 Series

Mobil Rarus SHC 1020 lubricants are supreme performance oils primarily intended to lubricate severe duty rotary screw and vane air compressors. They are particularly suited for severe service where mineral oil-based products are not meeting expectations, e.g. severe applications subjected to high final compression temperatures or where extended oil drain intervals are desired. The use of the Mobil Rarus SHC 1020 Series lubricants can result in cleaner compressors and lower deposits compared to conventional mineral oils for longer running periods between maintenance intervals.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity
- Excellent protection of internal compressor components, gears and bearings
- Reduced formation of sludge and deposits in crankcases and discharge lines

Applications:

- Primarily recommended for rotary screw and vane air compressors
- Very effective in screw type compressors with oil injection cooling
- Units operating under severe conditions
- Multi-stage units with a history of excessive oil degradation from mineral oil-based products
- Compressor systems with critical gears and bearings
- Compressors used in stationary and mobile applications

Product Name	ISO VG
Mobil Rarus SHC 1024	32
Mobil Rarus SHC 1025	46
Mobil Rarus SHC 1026	68

Mobil Rarus™ 800 Series

Mobil Rarus 800 lubricants are supreme performance air compressor oils primarily intended for severe duty reciprocating air compressors operating under conditions where mineral-oil based products are not meeting expectations. They are engineered to meet or exceed the stringent requirements of the major compressor manufacturers. They are formulated with synthetic oils and a high technology additive system for exceptional equipment protection and reliability.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity
- Extended equipment service intervals reduces maintenance costs
- Improved compressor and valve performance
- Reduced formation of sludge and deposits in crankcases and discharge lines
- Excellent protection of valves, rings and cylinders

Applications:

- All types of air compressors but specifically recommended for reciprocating air compressors
- Units operating under severe conditions
- Multi-stage units with a history of excessive oil degradation from mineral oil-based products
- Cylinder and crankcase lubrication
- Compressor systems with critical gears and bearings
- Compressors used in stationary and mobile applications

Product Name	ISO VG
Mobil Rarus 824	32
Mobil Rarus 827	100
Mobil Rarus 829	150

Mobil Rarus™ 400 Series

Mobil Rarus 400 lubricants are premium performance ash-less air compressor oils designed to meet the stringent requirements of the major compressor manufacturers. They are formulated with high quality mineral oils and a high performance additive system for exceptional equipment protection as well as reliability for compressors operating under mild to severe conditions. They provide excellent wear protection and reduce maintenance costs by minimising equipment problems and downstream deposits and carryover.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity
- Extended equipment service intervals reduces maintenance costs
- Reduced formation of sludge and deposits in crankcases and discharge lines
- Excellent protection of valves, rings and cylinders

Applications:

- Reciprocating air compressor crankcases and cylinders
- Rotary screw compressors
- Rotary vane compressors
- Axial and centrifugal compressors
- Compressor systems with critical gears and bearings
- Compressors used in stationary and mobile applications

Product Name	ISO VG
Mobil Rarus 424	32
Mobil Rarus 425	46
Mobil Rarus 426	68
Mobil Rarus 427	100
Mobil Rarus 429	150

Mobil DTE™ Oil 205

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.

Advantages and Potential Benefits:

- Excellent resistance to washing by water and other entrained liquids, extends cylinder, ring, and packing life
- Effective lubrication at low feed rates, reduces oil purchases, extended valve rebuild intervals
- Good anti-wear and friction reducing capabilities which extends ring and packing life properties
- Rust and corrosion protection, extends compressor cylinder life
- Resists oxidation reducing discharge valve deposits, extended valve rebuild intervals

Applications:

- Cylinder lubrication of reciprocating compressors
- Special rotary sliding vane compressors in air and inert gas service
- Particularly applicable where wet gas is being compressed
- Primarily developed for multistage compressors
- Single and two-stage compressors operating at higher pressures or discharge temperatures or when compressing wet gas

Mobil DTE Oil 205 is not designed for use in compressor crankcases, particularly those compressors having high lead bearings, or crankshafts fitted with lead counterweights.

Product Name	ISO VG
Mobil DTE Oil 205	220

Mobil™ Compressor Oil 150 IR

Mobil Compressor Oil 150 IR is a premium quality compounded lubricant specially developed for cylinder lubrication of gas compressors. Compressor Oil 150 IR is recommended by ExxonMobil for use in reciprocating compressors with separate cylinder lubrication systems operating on natural gas or other hydrocarbon gases. Mobil Compressor Oil 150 IR is formulated from high quality mineral base oil and selected additives to give excellent thermal and oxidative stability helping to minimize harmful carbon deposit formation on exhaust valves, pistons, rods and packings. This lubricant also has excellent film strength that resists wash-off by wet gases or hydrocarbons in the gas which may condense during compression.

Advantages and Potential Benefits:

The use of the Mobil Compressor Oil 150 IR can result in cleaner compressors and lower deposits compared to conventional mineral oils, resulting in longer running periods between maintenance intervals. This product's excellent oxidation and thermal stability safely allow extended life capability while controlling sludge and deposit formation. It possesses outstanding anti-wear and corrosion protection, which enhances equipment life and performance.

- Low Carbon Deposit Formation helps improve valve response and performance and helps reduce deposits in discharge lines, also helping extend equipment life and contributes to reduced maintenance costs
- Excellent Oxidation and Thermal Stability, leading to longer oil life, helping improve filter life and lower maintenance costs and helps reduce deposit formation
- Excellent Wear Protection providing effective lubricating film helping to reduce wear of rings, cylinders, bearings and gears
- Excellent Water Resistance resists wash off by wet gases, helping to maintain equipment lubrication and protection
- Effective Rust and Corrosion Protection helps improve protection of valves and reduce wear of rings and cylinders

Applications:

Recommended for cylinder lubrication in reciprocating compressors with separate cylinder lubrication systems operating on natural gas or other hydrocarbon gases. Suitable for use over a wide range of operating temperatures typically found in an oil and gas production environment.

Product Name	ISO VG
Mobil Compressor Oil 150 IR	150

Compressor Oils Typical Properties

Product Name	Specific Gravity	Pour °C	Flash °C	Viscosity		V.I.	ISO VG
				cSt at 40°C	cSt at 100°C		
Mobil Rarus SHC 1024	0.85	-48	245	32	5.7	127	32
Mobil Rarus SHC 1025	0.85	-45	246	44	7.2	131	46
Mobil Rarus SHC 1026	0.86	-45	246	67	10.1	136	68
Mobil Rarus 824	0.92	-54	244	30	5.5	127	32
Mobil Rarus 827	0.96	-36	270	108	10.1	66	100
Mobil Rarus 829	0.97	-40	270	158	13.2	70	150
Mobil DTE 205	0.90	-9	282	220	19.5	101	220
Mobil Compressor Oil 150 IR	0.89	-6	206	150	16.4	116	150
Mobil Rarus 424	0.87	-18	236	32	5.4	105	32
Mobil Rarus 425	0.87	-18	238	46	6.9	105	46
Mobil Rarus 426	0.88	-18	251	68	8.9	105	68
Mobil Rarus 427	0.88	-18	264	105	11.6	100	100
Mobil Rarus 429	0.87	-18	269	147	14.7	100	150

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Gas Engine Oils

Mobil SHC Pegasus™ 30

Mobil SHC Pegasus 30 is a new category of advanced technology 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 30 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.

Mobil SHC Pegasus 30 uses a patented combination of high quality base stocks and advanced additive technology to deliver exceptional oxidation stability, nitration resistance and thermal stability, which in turn provide the opportunity to extend drain intervals by up to three times that of conventional gas engine oils. The formulation of Mobil SHC Pegasus 30 has been carefully balanced to provide outstanding anti-wear characteristics to protect heavily loaded valve train components, pistons, liners, bearings, and gear trains while maintaining compatibility with catalytic converter materials. Its detergent-dispersant system controls the formation of carbon and varnish deposits to minimize oil consumption and maintain engine cleanliness even during extended drain intervals. Extended drain intervals can translate to lower operating and maintenance costs.

Fuel can be one of the largest expenses in any application. Mobil SHC Pegasus 30 offers the opportunity to reduce fuel consumption. Extensive and statistically validated independent laboratory testing, bench testing and field testing demonstrated that Mobil SHC Pegasus 30 helped reduce fuel consumption by up to 1.5% compared to a standard natural gas engine oil.*

Advantages and Potential Benefits:

- Patented technology proven to provide up to 1.5% reduction in fuel consumption compared to standard natural gas engine oils*
- Improves oil drain interval; reduces number of oil changes, fewer oil purchases, creates less waste oil and labor to help lower operating costs and increase engine availability Increased engine availability enables higher productivity
- Helps control deposits in combustion chamber and piston ring zone to maximize engine efficiency and reliability Helps control deposits in heat exchangers to maximize heat production
- Low oil volatility helps minimize engine and exhaust system deposits to help extend catalytic converter life and extend intervals between heat exchanger cleanings Helps reduce make up oil additions and lubricant purchases
- Helps control wear on critical engine components Maintains engine reliability and performance

Applications:

- Turbocharged, naturally aspirated, medium to high speed four-cycle engines requiring a low ash oil
- Lean-burn and stoichiometric four-cycle engines operating under high load, high temperature conditions
- High-speed four-cycle gas engines used in cogeneration applications
- Natural gas fueled engines equipped with catalytic converters
- Gas engines operating on fuel that contains low levels of hydrogen sulphide. Consult OEM for specific fuel gas and oil drain interval recommendations

Product Name	SAE Grade
Mobil SHC Pegasus 30	30

* The fuel 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% increase in fuel efficiency compared to Mobil Pegasus 1005 and 805 series when tested in standard natural gas engine applications under controlled conditions. Efficiency improvements will vary based on operating conditions. The energy efficiency claim for this product is based on test results on the use of the fluid conducted in accordance with all applicable industry standards and protocols.

Mobil Pegasus™ 1

Mobil Pegasus 1 is a high performance synthetic gas engine oil, designed to meet the highest performance requirements. It is engineered for the most demanding naturally aspirated and turbocharged stoichiometric and lean-burn stationary gas engines. The unique formulation of Mobil Pegasus 1 minimises ash deposits, piston land and ring belt deposits, liner scuffing as well as valve seat and valve face wear. It also provides outstanding resistance to oxidation.

The inherently high viscosity index of the synthetic oil components ensures a protective lubricant film at high temperatures, well above the limit for mineral oil-based products.

Advantages and Potential Benefits:

- Extended lubricant drain intervals reduces maintenance costs
- Reduced formation of sludge and deposits in critical engine areas improves engine life
- Increased operating capacity, even at high temperatures
- Reliable flow and lubrication for easy startup, even at low temperatures
- Excellent protection against wear and scuffing of liners and pistons, particularly in high BMEP engines, reduces maintenance costs
- Fully compatible with seals commonly used in gas engines and with mineral oils; mixture with mineral oils will lower the performance benefits that can be obtained from this outstanding lubricant

Applications:

- Wide range of gas engine models
- High speed, four-cycle turbocharged and naturally aspirated gas engines requiring a nominal 0.5% ash gas engine oil
- Stoichiometric and lean-burn designs
- Ebulliently cooled applications because of its wide temperature range capability, extended engine protection and long oil life
- Gas engines using alternative energy sources for fuel gas containing up to 0.3% sulphur as hydrogen sulphide

Product Name	SAE Grade
Mobil Pegasus 1	40

Mobil Pegasus™ 1005

Mobil Pegasus 1005 is the latest addition to the Mobil Pegasus pedigree of proven natural gas engine oils with a balanced, durable formulation. Designed to provide today's high output, low emission fourcycle gas engines with the highest levels of protection, it is a high performance gas engine oil that maintains superior performance in earlier model engines.

Mobil Pegasus 1005 uses high quality base stocks and advanced additive technology to deliver exceptional oxidation stability, nitration resistance and thermal stability. Mobil Pegasus 1005 formulation provides outstanding anti-wear characteristics to protect heavily loaded valve train components, pistons, liners, bearings and gear trains while maintaining compatibility with catalytic converter materials. Its detergent and dispersant system controls the formation of carbon and varnish deposits to minimise oil consumption and maintain engine cleanliness even during extended drain intervals.

Mobil Pegasus 1005 keeps engines running longer and cleaner with improved reliability to increase productivity.

Advantages and Potential Benefits:

- Extended lubricant drain intervals reduces maintenance costs
- Reduced formation of sludge and deposits maximises engine efficiency and heat production

Applications:

- Caterpillar, Deutz, Jenbacher, Rolls Royce-Bergen, Wartsila, Waukesha and other turbocharged, naturally aspirated, medium to high speed four-cycle engines requiring a low ash oil
- Lean-burn and stoichiometric four-cycle engines operating under high load, high temperature conditions
- High speed four-cycle gas engines used in cogeneration applications
- Natural gas fueled engines equipped with catalytic converters
- Applications using alternate fuels containing low levels of sulfur or chlorine
- Field gathering operations where sour gas (low levels of hydrogen sulphide is less than 0.1% or 1000ppm) is used as fuel

Product Name	SAE Grade
Mobil Pegasus 1005	40

Mobil Pegasus™ 805

Mobil Pegasus 805 is a premium performance gas engine oil engineered to meet the rigorous demands of today's high output four-cycle engines. It is 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, lacquer and sludge deposits, resulting in cleaner engines, longer oil life and reduced filter costs.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity
- Excellent protection against wear and scuffing of liners, pistons and value train components reduces maintenance costs
- Reduced formation of combustion chamber ash
- Improved spark plug life and performance

Applications:

- Caterpillar, Superior, Waukesha and other turbocharged, naturally aspirated, medium to high speed four-cycle engines requiring a low ash oil
- Engines experiencing valve face and seat wear
- Lean-burn and stoichiometric four-cycle engines
- Engines with catalytic converters
- Applications using alternate fuels containing low levels of sulfur or chlorine
- Field gathering operations where sour gas (low levels of hydrogen sulphide) is used as fuel

Product Name	SAE Grade
Mobil Pegasus 805	40

Mobil Pegasus™ 801

Mobil Pegasus 801 is a premium performance gas engine oil for gas engines operating at low, medium and high speeds where low ash or ash-less oils are recommended. It provides outstanding engine cleanliness and performance by preventing the formation of carbon and ash deposits on pistons, ring belt areas, exhaust and intake ports, valves and valve stems as well as combustion chambers. Mobil Pegasus 801 also reduces the potential for port carboning of two-cycle gas engines. It minimises engine wear and protects valve faces, seats and guides of turbocharged, four-cycle engines.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity
- Excellent protection against wear of rings, pistons and liners reduces maintenance costs
- Reduced formation of valve, combustion chamber ash and carbon build-up

Applications:

- Crankcases, power cylinders, and compressor cylinders of spark-ignited, two- and four-cycle Gas engines operating on clean fuel
- Engines that drive generators for power production or gas compressors in gathering, transmission, storage, and distribution of natural gas
- Ebulliently cooled engines
- Remotely located engines which operate virtually unattended for long periods; operated at, or in excess of, full-rated output while other applications are intermittent or stand-by service
- Multi-purpose natural gas engine applications, particularly involving highly turbocharged engines requiring scuff protection for cylinder liners and piston skirts
- Lubricating compressor cylinders with the same oil as the engine crankcase when natural or petroleum gas is being compressed and is dry and free of suspended liquids or corrosive components

Product Name	SAE Grade
Mobil Pegasus 801	40

Mobil Pegasus™ 710

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. 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.

Its high reserve alkalinity and TBN retention also makes it suitable for engines operating on fuels that contain low amounts of corrosive materials such as hydrogen sulphide. The excellent anti-corrosion properties prevent corrosive wear in cylinders, valve areas and bearings resulting in longer engine life. Mobil Pegasus 710 anti-wear and anti-scuff performance assures minimal piston scuffing, scoring and cylinder and ring wear.

Advantages and Potential Benefits:

- Lower wear of engine components, reduced scuffing of liners of highly loaded gas engines, providing excellent break-in protection
- Cleaner engines, extended drain intervals, reduced filter costs and excellent resistance to oxidation and nitration
- Protects valve seats and faces on four stroke-cycle engines and controls combustion chamber ash formation and improves spark plug performance
- Reduces valve guide wear in four stroke-cycle gas engines protects bearings and internal components
- Controls formation of acids in the oil and protects engine components from acidic attack

Applications:

- Spark ignited four-cycle gas engines with very low oil consumption
- Engines experiencing valve train wear and corrosion
- Engines operating on fuel containing low levels of sulphur and chlorine compounds
- Reciprocating compressor cylinders compressing natural gas
- High output or ambient rated engines operating at or in excess of rated capacity under high temperatures

Product Name	SAE Grade
Mobil Pegasus 710	40

Mobil Pegasus™ 605

The Mobil Pegasus 605 is a 0.5% ash gas engine oil with exceptional reserve alkalinity. It is designed to offset the negative effects of acidic materials on engine components.

Advantages and Potential Benefits:

- Extended lubricant drain intervals reduces maintenance costs
- Excellent protection against corrosion by contaminated gas
- Excellent protection against wear of engine components and scuffing of highly loaded gas engine liners
- Improved spark plug performance
- Optimum operating efficiency

Applications:

- Gas engines operating on fuel that contains moderate levels of hydrogen sulphide
- Engines operating on fuel containing corrosive components such as TOHCl (Total Organic Halides such as Chloride) such as landfill or biomass gas
- Spark ignited four-stroke cycle gas engines with very low oil consumption
- Medium and high speed four-cycle engines equipped with catalytic converters requiring a low ash gas engine oil
- Reciprocating compressors operating on natural gas that contains sulphur or chlorine compounds

Product Name	SAE Grade
Mobil Pegasus 605	40

Mobil Pegasus™ 610

The Mobil Pegasus 610 is a 1.0% ash, high TBN gas engine oil with exceptional reserve alkalinity. It is designed to offset the negative effects of corrosive materials on engine components.

Advantages and Potential Benefits:

- Extended lubricant drain intervals reduces maintenance costs
- Extended catalytic converter service intervals reduces maintenance costs
- Excellent protection against corrosion by contaminated gas
- Reduced formation of combustion chamber ash
- Improved spark plug performance
- Optimum operating efficiency

Applications:

- Gas engines operating on fuel that contains moderate levels of hydrogen sulphide
- Engines operating on fuel containing corrosive components such as TOHCl (Total Organic Halides such as Chloride)
- Spark ignited four-stroke cycle gas engines with very low oil consumption
- Reciprocating compressors operating on natural gas that contains sulphur or halogens
- High output or naturally aspirated engines operating at, or in excess of, rated capacity under high temperatures

Product Name	SAE Grade
Mobil Pegasus 610	40

Gas Engine Oils Typical Properties

Application Product Name	Specific Gravity	Pour °C	Flash °C	Viscosity		V.I.	ASH %	SAE
				cSt at 40°C	cSt at 100°C			
Mobil SHC Pegasus 30	0.84	-42	255	65	10.5	162	0.5	30
Mobil Pegasus 1	0.85	-48	238	94	13.0	137	0.5	40
Mobil Pegasus 1005	0.85	-15	247	125	13.0	100	0.5	40
Mobil Pegasus 805	0.89	-12	262	130	13.5	99	0.5	40
Mobil Pegasus 801	0.89	-15	249	125	13.2	97	0.1	40
Mobil Pegasus 710	0.89	-15	249	121	13.2	98	1.0	40
Mobil Pegasus 605	0.89	-18	262	124	13.2	100	0.5	40
Mobil Pegasus 610	0.89	-18	264	130	13.8	102	1.0	40

Gear Oils

Mobil SHC™ Gear Series

Mobil SHC Gear Series is a line of supreme performance, fully synthetic industrial gear oils designed to provide outstanding protection of gears and bearings, extended oil life even under extreme conditions, helping to enable problem-free operation of equipment and increased customer productivity. 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.

Advantages and Potential Benefits:

To address the issue of micropitting wear, our formulation scientists used a combination of additives which would resist traditional gear wear mechanisms as well as protecting against micropitting. Mobil SHC Gear products provide exceptional oil life and deposit control and resistance to thermal/oxidative and chemical degradation, as well as the balance of the performance features.

- Superb protection from micropitting fatigue wear as well as high resistance to traditional scuffing wear
- Excellent resistance to degradation at high temperatures
- Reduced fluid friction produces lower operating temperatures and improved gear efficiency
- High viscosity index equating to reduced viscosity change with temperature
- Excellent resistance to rust and corrosion and very good demulsibility
- Excellent shear stability
- No filter plugging, even in presence of water
- Excellent seal compatibility
- Excellent compatibility with common gearbox materials and with mineral-based gear oils

Applications:

- Application Considerations: While the Mobil SHC Gear Series are compatible with mineral oil based products, admixture may detract from their performance. Consequently it is recommended that before changing a system to one of the Mobil SHC Gear Series, it should be thoroughly cleaned out and flushed to achieve the maximum performance benefits
- Mobil SHC Gear lubricants are recommended for enclosed industrial gear drives including steel-on-steel spur, helical, and bevel gears. They are especially recommended for applications that may be subject to micropitting: especially heavily loaded gearboxes with surface-hardened tooth metallurgies. 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 Name	ISO VG
Mobil SHC Gear 150	150
Mobil SHC Gear 220	220
Mobil SHC Gear 320	320
Mobil SHC Gear 460	460
Mobil SHC Gear 680	680
Mobil SHC Gear 1000	1000

Mobil SHC™ Gear Series

The Mobil SHC Gear 1500, 3200, and 6800 lubricants are supreme performance heavy-duty gear oils primarily designed for all kinds of enclosed gearing as well as 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. 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.

The Mobil SHC Gear 1500, 3200, and 6800 find application in a wide range of enclosed gear applications, as well as plain and rolling element bearings. Because of the very high viscosities they can meet the lubrication needs of very slow speed and high load/high temperature gears and bearings; they are ideal for situations in which conventional products operate in the boundary regime. There may be situations where a lubricant bath or recirculation system is used to apply the oil.

Advantages and Potential Benefits:

The Mobil SHC Gear 1500, 3200, and 6800 are leading members of the Mobil SHC brand of products that are world-renowned for their innovation and performance. The Mobil SHC Gear 1500, 3200, and 6800 lubricants provide benefits not possible with mineral stocks, particularly under extreme high and low temperature operating conditions, and deliver performance features and customer benefits.

- Outstanding load-carrying and antiwear properties
- Very high viscosity grades available, without reduction of properties or performance capability
- High viscosity index
- Low traction properties
- Outstanding thermal/oxidation resistance and long product life
- Light color

Applications:

Application Considerations: Mobil SHC Gear 1500, 3200, and 6800 oils are recommended for all types of enclosed steel-on-steel gear drives. They are suitable for both circulation and splash lubrication systems. They are particularly recommended for gear sets operating under heavy or shock loads and low speeds where boundary lubrication may prevail.

- Mobil SHC Gear 1500, 3200 and 6800 - Industrial enclosed spur, helical and bevel gears, especially slow speed, and/or high load units
- Mobil SHC Gear 1500, 3200 and 6800 - Plain and rolling element bearings, especially in slow speed, and/or high load applications
- Mobil SHC Gear 3200 and 6800 - Railroad DC Traction Motor drives
- Mobil SHC Gear 3200 and 6800 - Certain open gear applications such as oiling pinions or specially designed circulation system

Product Name	ISO VG
Mobil SHC Gear 1500	1500
Mobil SHC Gear 3200	3200
Mobil SHC Gear 6800	6800

Mobil SHC™ Gear Series

Mobil SHC Gear 22M and 46M are supreme 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.

Mobil SHC Gear 22M and 46M exceed Falk Corporation's minimum viscosity requirements for intermittent lubrication of gears - winter and summer grades, respectively. These grades also meet the viscosity requirements for AGMA lubricant numbers 14R and 15R, respectively, although they are not residual lubricants. Mobil SHC Gear 22M and 46M do not contain any solvent or any asphaltic-type base oil.

Advantages and Potential Benefits:

Mobil SHC Gear 22M and 46M provide benefits not possible with mineral stocks, particularly under extreme high and low temperature operating conditions, and deliver performance features and customer benefits. These ultra high viscosity products are particularly effective in low-speed, high load, high temperature situations and provide excellent gear and bearing protection, longer oil life and excellent all-round service compared with conventional products.

- Thick EHL fluid film formation and selected additives provide outstanding load-carrying, antiwear and tackiness properties
- Excellent pumpability at ambient temperatures
- Uses existing lubricant spray equipment
- Lower application rates than greases, less waste compared with asphalt/solvent products
- Light colored product

Applications:

- Mobil SHC Gear 22M and 46M are designed specifically for use in heavily loaded, low speed open gearing which drive stationary rotating machinery. Product is typically applied by intermittent by spray nozzle systems
- Kilns and mills in metal mining, cement and limestone production and in sugar plants
- Slow speed, heavily loaded plain and rolling contact bearings

Product Name	ISO VG
Mobil SHC Gear 22M	22,000
Mobil SHC Gear 46M	46,000

Mobil SHC™ Gear 680 OH

Mobil SHC Gear 680 OH is a supreme performance heavy-duty gear oil primarily designed to lubricate enclosed gearing as well as plain and rolling element bearings in off-highway equipment subject to shock and heavy loading. Mobil SHC Gear 680 OH is designed to provide outstanding service in terms of equipment protection, oil life, and problem-free operation helping to enable increased customer productivity. This scientifically engineered synthetic lubricant is 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. Mobil SHC Gear 680 OH delivers outstanding gear scuffing protection in heavily loaded gearboxes. 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.

Advantages and Potential Benefits:

Mobil SHC Gear 680 OH is a member of the Mobil SHC brand of products that are world-renowned for their innovation and performance. Mobil SHC Gear 680 OH provides benefits not possible with mineral stocks, particularly under extreme high and low temperature operating conditions.

- Outstanding load-carrying and antiwear properties
- High viscosity index
- Low traction properties
- Outstanding thermal/oxidation resistance and long product life
- Light color

Applications:

Mobil SHC Gear 680 OH is recommended for all types of enclosed steel-on-steel gear drives. Mobil SHC Gear 680 OH is suitable for both circulation and splash lubrication systems. Mobil SHC Gear 680 OH is available in an ISO VG 680, providing the right lubrication option for low temperature applications where pour points of -39ºC are required to high temperature applications where operating temperatures of 121ºC are encountered. Mobil SHC Gear 680 OH is particularly recommended for lubricating gear sets in off-highway applications such as those found in mining, where heavy or shock loads and boundary lubrication conditions may prevail.

Product Name	ISO VG
Mobil SHC Gear 680 OH	680

Mobilgear™ SHC XMP Series

Mobilgear SHC XMP supreme performance, fully synthetic industrial gear lubricants are designed to provide optimum equipment protection and oil life even under extreme conditions. Mobil's polyalphaolefin (PAO) technology gives it its exceptional oxidation resistance and thermal properties, naturally high viscosity index, excellent low temperature fluidity and absence of undesirable compounds that are often found in mineral oils. Mobilgear SHC XMP lubricants are recommended for enclosed industrial gear drives, including steel-on-steel spur, helical, and bevel gears. It is especially recommended for applications that may be subject to micropitting such as heavily loaded gearboxes with surface-hardened tooth metallurgies.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity, especially critical for inaccessible gearboxes
- Long gear and bearing life in enclosed gear drives operating under extreme conditions of load, speed and temperature
- Extended gear service intervals reduces maintenance costs
- Lower operating temperatures
- Optimum performance in water-contaminated applications, even at high temperatures
- Reduced energy consumption

Applications:

- Wind turbines, especially highly loaded and shock loaded units, remotely located units and extreme temperature environments
- Plastic extruder gearboxes
- Modern, highly loaded gearboxes used in the paper, steel, oil, textile, lumber and cement industries where gear protection and optimum oil life are required

Product Name	ISO VG
Mobilgear SHC XMP 320	320
Mobilgear SHC XMP 460	460

Mobil Glygoyle™ Series

Mobil Glygoyle lubricants are supreme performance oils for gears, bearings and compressors, designed to provide outstanding efficiency, equipment protection and oil life. These fully synthetic, polyalkylene glycol (PAG) lubricants were developed to operate beyond the capabilities of other synthetic lubricants and mineral oils. Their low pour points ensure excellent low temperature fluidity. The ISO 150 to 680 grades are approved for USDA/NSF H-1 food-grade use.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity
- Extended equipment service intervals reduces maintenance costs
- Reliable flow and lubrication for easy startup, even at low temperatures, especially important for successful operation of remotely located equipment
- Excellent protection of gears, even under heavy loads

Applications:

- Filled for life gearboxes, especially high-ratio/low-efficiency worm gears
- All worm gear applications such as those used in conveyers, escalators, material handling, press drives, packaging machinery, ski lifts, agitators and mixers
- Other gear and bearing applications in the cement, metalworking, plastics, food and textile finishing industries
- Plastic calendars
- Gas compression utilising reciprocation, rotary, screw, and centrifugal type compressors

Product Name	ISO VG
Mobil Glygoyle 150	150
Mobil Glygoyle 220	220
Mobil Glygoyle 320	320
Mobil Glygoyle 460	460
Mobil Glygoyle 680	680

Mobilgear™ XMP Series

Mobilgear XMP 460 is an extra high performance industrial gear oil designed to provide optimum equipment protection and oil life even under extreme conditions. Mobilgear XMP Series are based on high quality mineral base stocks and an advanced proprietary additive system designed to provide excellent protection against conventional wear modes such as scuffing. It also provides a high level of resistance against micropitting fatigue. Mobilgear XMP products offer outstanding rust and corrosion protection compared to conventional gear oils, including seawater and acidic water protection. They show no tendency to plug fine filters when wet and are compatible with ferrous and nonferrous metals, even at elevated temperatures.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity
- Long gear and bearing life in enclosed gear drives operating under extreme conditions of load, speed and temperature
- Extended gear service intervals reduce maintenance costs
- Optimum performance of water-contaminated applications, even at high temperatures

Applications:

- Wind turbines
- Plastic extruder gearboxes
- Gearboxes found in the paper, steel, oil, textile, timber and cement industries

Product Name	ISO VG
Mobilgear XMP 460	460

Mobilgear™ 600 XP Series

Mobilgear 600 XP lubricants are extra high performance gear oils with outstanding extreme pressure characteristics and load-carrying properties. They are intended for use in all types of enclosed gear drives with circulation or splash lubrication systems. They are also designed to stay ahead of the changing needs of gearbox technology. An increase in power density increases demands on gear oils. Mobilgear 600 XP Series' balanced formulation provides maximum wear and corrosion protection while maintaining compatibility with common gearbox seal materials. Mobilgear 600 XP helps maintain gearbox seal integrity to prevent oil leaks and contamination.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity, especially critical for inaccessible gearboxes
- Improved bearing life increases productivity and reduces replacement costs
- Outstanding seal compatibility reduces leakage, oil consumption and contamination ingress reduce maintenance, extend gearbox reliability and increase productivity
- Optimum performance of water-contaminated applications or equipment prone to oil foaming

Applications:

- Industrial gearing for conveyers, agitators, dryers, extruders, fans, mixers, presses, pulpers, pumps (including oil well pumps), screens, extruders and other heavy duty applications
- Marine gearing including main propulsion, centrifuges, deck machinery such as winches, windlasses, cranes, turning gears, pumps, elevators and rudder carriers
- Non-gear applications include shaft couplings, screws and heavily loaded plain and rolling contact bearings operating at slow speeds

Product Name	ISO VG
Mobilgear 600 XP 68	68
Mobilgear 600 XP 100	100
Mobilgear 600 XP 150	150
Mobilgear 600 XP 220	220
Mobilgear 600 XP 320	320
Mobilgear 600 XP 460	460
Mobilgear 600 XP 680	680

Mobil 600W™ Cylinder Oil

Mobil 600W Super Cylinder Oil is a high performance high viscosity oil. They are designed for use in enclosed worm gears operating at moderate to high speeds and temperatures; where heavy loads, slow speeds or high temperatures demand high viscosity oils. They are also suitable for all steam engine 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 are resistant to water washout.

Advantages and Potential Benefits:

- Excellent protection of gears and bearings at high temperatures and heavy loads for optimum performance
- Extended gear service intervals reduce maintenance costs
- Optimum system efficiency and fewer unplanned stoppages

Applications:

- Splash lubrication of enclosed worm gears operating at moderate to high speeds and temperatures
- Steam cylinders, couplings, bearings, and break-in of compressor cylinders

Product Name	ISO VG
Mobil 600W Super Cylinder Oil	460

Mobiltac™ Series

Mobiltac 375 NC and 275 NC are extra high performance non-leaded, diluent-type, heavybodied 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 275 NC adhere strongly to gear teeth and other machine elements to resist excessive throw-off. They provide a wear-resistant, viscous, continuous film that lubricates well under boundary conditions.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity
- Extended gear service intervals reduce maintenance costs
- Reliable flow and lubrication for easy startup, even at low temperatures
- Optimum performance in water-contaminated applications
- Excellent protection at low temperatures
- Easy to clean with rags and conventional solvents or cleaning fluids

Applications:

- Mobiltac 375 NC: Contains a high-viscosity base oil and is recommended for the lubrication of highly loaded open gears, including those that operate at high temperatures. For example, ring gears on cement kilns and large gears on ore-processing mills
- Mobiltac 275 NC: Mine and quarry shovels, draglines, and related equipment; also open gears, racks and pinions, swing gears, booms and sticks
- Minimum operating temperature for Mobiltac is -1ºC for 375 NC and -9ºC for 275 NC

Gear Oils Typical Properties

Application Product Name	Specific Gravity	Pour °C	Flash °C	Viscosity		V.I.	ISO VG
				cSt at 40°C	cSt at 100°C		
Mobil SHC Gear 150	0.86	-54	233	150	22.2	176	150
Mobil SHC Gear 220	0.86	-45	233	220	30.4	180	220
Mobil SHC Gear 320	0.86	-48	233	320	40.6	181	320
Mobil SHC Gear 460	0.86	-48	234	460	54.1	184	460
Mobil SHC Gear 680	0.86	-42	234	680	75.5	192	680
Mobil SHC Gear 1000	0.87	-33	234	1000	99.4	192	1000
Mobil SHC Gear 1500	0.88	-18	230	1500	113	165	1500
Mobil SHC Gear 3200	0.89	-9	230	3200	183	165	3200
Mobil SHC Gear 6800	0.90	-6	230	6800	365	180	6800
Mobil SHC Gear 22M	0.89	6	240	22000	700	180	22000
Mobil SHC Gear 46M	0.92	15	240	46000	1375	180	46000
Mobil SHC Gear 680 OH	0.86	-39	233	680	76.1	193	680
Mobilgear SHC XMP 320	0.86	-38	242	335	38.3	164	320
Mobilgear SHC XMP 460	0.86	-36	232	460	48.7	166	460
Mobil Glygoyle 150	1.08	-33	265	150	26.1	210	150
Mobil Glygoyle 220	1.08	-33	265	220	38.1	225	220
Mobil Glygoyle 320	1.08	-33	265	320	55.2	240	320
Mobil Glygoyle 460	1.08	-33	265	460	77.2	250	460
Mobil Glygoyle 680	1.08	-33	265	680	112.4	265	680
Mobilgear XMP 460	0.91	-12	270	460	30.6	96	460
Mobilgear 600 XP 68	0.88	-27	230	68	8.8	101	68
Mobilgear 600 XP 100	0.88	-24	230	100	11.2	97	100
Mobilgear 600 XP 150	0.88	-24	230	150	14.7	97	150
Mobilgear 600 XP 220	0.88	-24	240	220	19.0	97	220
Mobilgear 600 XP 320	0.90	-24	240	320	24.1	97	320
Mobilgear 600 XP 460	0.90	-15	240	460	30.6	96	460
Mobilgear 600 XP 680	0.90	-9	285	680	39.2	90	680
Mobil 600W Super Cylinder Oil	0.91	-6	282	460	30.5	95	460
Mobiltac 275 NC	0.99	-	150	-	-	-	-
Mobiltac 375 NC	0.96	-	135	5000	1260	180	-

Greases

Mobil SHC Polyrex™ Series

Mobil SHC Polyrex 462 is a high temperature synthetic Polyurea grease. It is specifically designed to improve productivity by solving high temperature lubrication problems in both general industry and food processing applications.

Mobil SHC Polyrex 462 is designed to offer a combination of high temperature performance, excellent water resistance, and the balanced wear performance consistent with Mobil grease products. They are NSF H1 registered and meet the requirements of manufacturers such as Kosher/Parve.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity
- Excellent protection against wear, rust and corrosion of bearings under heavy loads and washouts
- Extended equipment service intervals reduces maintenance costs

Applications:

- Mobil SHC Polyrex 462: heavily loaded plain and antifriction bearings, as well as in bearings such as steam heated rolls, exhaust fan bearings, felt roll bearings, and oven conveyor bearings where extreme temperatures are a concern. The recommended operating temperature range is -20ºC to 170ºC

Product Name	NLGI Grade
Mobil SHC Polyrex 462	2

Mobil SHC™ Grease 460 WT

Mobil SHC Grease 460 WT is a supreme performance product to exceed the demanding requirements of wind turbine applications at extremes of temperature. The unique features of synthetic base fluids are combined with a high quality lithium complex thickener. The wax-free nature of synthetic fluids and the low co-efficient of traction provide excellent low temperature pumpability as well as very low starting and running torque. The lithium complex thickener contributes excellent adhesion, structustability and resistance to water.

Mobil SHC Grease 460 WT is formulated for yaw, pitch and main bearings of wind turbines. It has become the first fill product of choice for many wind turbine builders and component suppliers. The reputation is based on its exceptional quality and reliability with proven outstanding performance in more than 10,000 wind turbines worldwide.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity
- Increased operating capacity, even at high temperatures and low torque
- Reliable flow and lubrication for easy startup, even at low temperatures
- Improved lubrication for longer bearing life using centralised grease systems/dispensers
- Optimum performance in hostile aqueous environments

Applications:

- Tough wind turbine applications
- Yaw, pitch and main bearings either manual greased or using centralized grease systems or grease dispensers. The recommended operating temperature range is -30º C to 150ºC

Product Name	NLGI Grade
Mobil SHC Grease 460 WT	1.5

Mobilith SHC™ Series

Mobilith SHC greases are supreme performance lubricants designed for a wide variety of applications at extreme temperatures. These products offer the potential for energy savings and can reduce operating temperatures in the load zone of rolling element 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 at high and low temperatures.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity
- Increased operating capacity, even at high temperatures and low torque
- Reliable flow and lubrication for easy startup, even at low temperatures
- Improved lubrication for longer bearing life
- Optimum performance in hostile aqueous environments

Applications:

- Mobilith SHC 100: An anti-wear and extreme pressure grease for higher speed applications such as electric motors, where reduced friction, low wear and long service life are required
- Mobilith SHC 220: Multi-purpose grease for heavy duty automotive and industrial applications
- Mobilith SHC 221: Multi-purpose, extreme pressure grease recommended for heavy-duty automotive and industrial applications, particularly where centralized grease systems are utilized
- Mobilith SHC 460: An extreme pressure grease for tough industrial applications in steel mills, paper mills and marine applications
- Mobilith SHC 1500: Plain and rolling bearings operating at extremely slow speeds, under heavy loads and high temperatures, for example, rotary kiln roller bearings and slag transfer rail car bearings
- Mobilith SHC 007: Is recommended in grease filled industrial gear cases subject to high temperatures, where conventional semi fluid greases will not provide acceptable lubricant life and in non-driven heavy-duty truck trailer wheel hubs

Product Name	NLGI Grade
Mobilith SHC 100	2
Mobilith SHC 220	2
Mobilith SHC 221	1
Mobilith SHC 460	1.5
Mobilith SHC 1500	1.5
Mobilith SHC 007	00

Mobil™ Aviation Grease SHC 100

Mobil Aviation Grease SHC 100 is a supreme 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. Mobil Aviation Grease SHC 100 is the product of choice for aircraft wheel bearing applications.

Advantages and Potential Benefits:

A key factor in the development of Mobil Aviation Grease SHC 100 was the close contact between ExxonMobil product engineers and key OEMs to ensure that the lubricant would provide exceptional performance in aircraft wheel bearings. This work has helped to confirm the results from ExxonMobil laboratory tests showing the exceptional performance of Mobil Aviation Grease SHC 100 including long grease life, enhanced bearing protection and bearing life in aircraft wheels, and wide temperature range of application.

- High viscosity index (VI) base stock with no wax content allows for a wide application temperature ranges, with excellent protection at high temperatures and low torque, easy start-up at low temperatures
- Outstanding high temperature and low temperature performance allows for a thicker fluid film protecting against wear of equipment parts operating at high temperature
- Excellent protection against wear, rust, and corrosion reducing downtime and maintenance costs because of reduced replacement of equipment parts
- Excellent structural stability and oxidation resistance allows for long intervals between re-lubrication and improved bearing life

Applications:

- Recommended for aviation applications which need a lubricant that can perform normal functions, yet go far beyond in terms of high and low temperatures and long-life performance
- An NLGI Grade 2/ISO VG 100 grease having the cold-temperature pumping resistance of most mineral-oil NLGI Grade 0 greases
- Provides outstanding protection at operating temperatures from –54°C to 177°C
- Recommended for high speed, heavy load applications such as wheel bearings, as well as for slower speed, high load applications such as landing gear bearings, slides, and joints
- Mobil Aviation Grease SHC 100 is approved as a wheel bearing grease by all major aircraft wheel manufacturers

Product Name	NLGI Grade
Mobil Aviation Grease SHC 100	2

Mobilgrease™ 28

Mobilgrease 28 is a supreme performance, high temperature, antiwear grease designed to combine the unique features of a polyalphaolefin (PAO) synthetic base fluid with an organo-clay (non-soap) thickener. The clay thickener provides excellent stability at high temperatures and Mobilgrease 28 has a high dropping point value of around 300ºC. The wax-free nature of the synthetic base fluid, together with its low coefficient of traction compared with mineral oils, provide excellent low temperature pumpability, very low starting and running torque, and can reduce operating temperatures in the load zone of rolling element bearings.

In addition, it resists water washing, provides superior load-carrying ability, reduces frictional drag, and prevents excessive wear. Tests show that Mobilgrease 28 prevents friction oxidation (fretting) and lubricates rolling element bearings under conditions of high speeds and temperatures. It has also shown superior ability to lubricate heavily loaded sliding mechanisms, such as wing flap screw jacks. Its consistency is between an NLGI No. 1 and No. 2 grease.

Advantages and Potential Benefits:

A particular need of aviation greases is the need to resist high temperature stresses, while providing excellent starting and low torque at low-temperature. To meet this combination of needs our product formulation scientists chose proprietary synthetic base oils for Mobilgrease 28 because of their exeptional thermal/oxidative resistance potential, and superb low-temperature capability.

Mobilgrease 28 meets the requirements of key military and commercial aviation specifications and has built up a superb reputation for performance and reliability among users around the world.

- High viscosity index base stock with no wax content ensures a very wide operating temperature range - outstanding high and low temperature performance and excellent film protection at high temperatures
- Low traction base oil leads to low sliding friction and reduced heat buildup and the potential for energy savings
- Excellent protection against fretting wear and corrosion providing superb bearing protection and extended bearing life and reduced bearing replacement costs
- Extreme-pressure characteristics, avoid excessive wear, even under shock load
- High thermal/oxidative stability, extends relubrication intervals
- High resistance to water washout, maintains excellent grease performance in adverse weather and other water-exposure conditions

Applications:

- Mobilgrease 28 is approved against military specifications MIL-PRF-81322G for wide temperature range aviation service and meets the quality level DOD-G-24508A for shipboard service.
- Specific military and civil aviation applications include:
  - Landing wheel assemblies
  - Control systems, screw jacks, servo devices, actuators, sealed-bearing motors and oscillating bearings
  - Helicopter rotor bearings on aircraft and on naval shipboard auxiliary machinery
  - Subject to equipment manufacturers approvals where superseded specifications MIL-G-81322 (WP), MIL-G-7711A, MIL-G-3545B, and MIL-G-25760A may be called for

Product Name	NLGI Grade
Mobilgrease 28	1.5

Mobilgrease™ 33

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.

Advantages and Potential Benefits:

The lithium complex thickener system provides excellent structural stability and resistance to water wash-out. Polyalphaolefin base oil is used in Mobilgrease 33 because of its exceptional thermal/oxidative resistance potential, low volatility, and superb low-temperature capability, without the potential vulnerability of an ester base oil to degradation from reaction with water. The synthetic polyalphaolefin base oil offers excellent low-temperature mobility/pumpability and very low starting and running torque values. In addition, the state-of-the art additive system in Mobilgrease 33 provides superior rust and wear protection and load-carrying capacity compared to aviation greases that meet the minimum requirements of the MIL-PRF-23827 specification.

- High viscosity index polyalphaolefin basestock offers a very wide operating temperature range – outstanding high and low temperature performance and excellent lubricant film protection at high temperatures
- Exceptional resistance to thermal and oxidative degradation leading to long grease and lubricated part service life
- Excellent protection against wear, corrosion, and rusting offering excellent bearing and component protection
- Extreme-pressure characteristics leading to the prevention of excessive wear, even under shock load
- High resistance to water washout allowing for excellent grease performance in adverse weather and other water-exposure conditions

Applications:

Mobilgrease 33 is a true multipurpose aviation grease intended for use in highly loaded anti-friction bearings, gears, and actuators as well as instruments, high speed bearings (though not recommended for wheel bearings), and general airframe lubrication, over operating temperatures from –73ºC to 121ºC. It can be used in all applications for which the aircraft manufacturer specifies U.S. Military Specification MIL-PRF-23827, Type I (Grease, Aircraft and Instrument, Gear and Actuator Screw, Grease thickened with metallic soap), Boeing BMS 3-33B (Grease, Aircraft, General Purpose), and Airbus AIMS09-06-002/SAE AMS3052 (Grease, General Purpose, Airframe, Low Temperature Range, Lithium Thickened). Mobilgrease 33 is listed in the Qualified Products List of Airbus, Boeing, and the U.S. Military for these specifications. The NATO Code Number for Mobilgrease 33 is G-354.

Product Name	NLGI Grade
Mobilgrease 33	1.5

Mobilith SHC™ PM 460

Mobilith SHC PM 460 is a superior performance product designed specifically for severe paper machine applications, including extreme temperature environments and exposure to different qualities of water. 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 460 is designed for use in the most critical rolling element bearing applications in paper machines. Mobilith SHC PM 460 provides outstanding protection against rust and typical acid and alkali water corrosion, making them ideal for the wet end of the paper machine. The low volatility and excellent oxidation stability of the PAO base stock ensures excellent service at high temperatures typical of dry end conditions.

Advantages and Potential Benefits:

- Outstanding high temperature and low temperature performance gives a wide application temperature range, from -40ºC to 150°C with excellent protection at high temperatures and low torque, easy start-up at low temperatures
- Excellent protection against wear, rust and corrosion, including acidic water leads to reduced downtime and maintenance costs because of reduced wear, rust and corrosion even in acidic and alkaline water environments
- Excellent structural stability and oxidation resistance, extending service life with longer intervals between relubrication and improved bearing life
- Excellent wear protection under heavy loads, slow speeds, and high temperatures, giving outstanding protection of slow speed, heavily loaded bearings, with extended bearing life
- Outstanding structural stability in the presence of water, retaining excellent grease performance in hostile aqueous environments

Applications:

Mobilith SHC PM 460 is recommended for critical rolling element bearing applications in paper machines. Included among these are:

- Wet end paper machine bearings
- Highly loaded press section bearings
- High-temperature felt roll and calendar stack bearings

Product Name	NLGI Grade
Mobilith SHC PM 460	1.5

Mobiltemp SHC™ Series

Mobiltemp SHC Series products are supreme performance antiwear greases primarily intended for high temperature applications. They combine the unique features of polyalphaolefin (PAO) synthetic base fluids with those of an organo-clay, non-soap thickener. The excellent resistance to thermal/oxidative degradation provided by the PAO base, coupled with the excellent high temperature structural stability and high dropping point of the clay thickener result in outstanding high temperature greases. The wax-free nature of the synthetic base fluid and its high viscosity index also provide superior low temperature lubrication as well as excellent film protection at high temperatures.

Advantages and Potential Benefits:

To combat high thermal exposure of the oil our product formulation scientists chose PAO synthetic base oils for Mobiltemp SHC Series oils because of their exceptional thermal/oxidative resistance potential. Our formulators used a special clay thickener to provide excellent structural stability and high dropping point.

- Outstanding high and low temperature performance, reducing downtime and lower maintenance costs and excellent resistance to oxidation and maintenance of grease structure at high temperatures extended service life with longer intervals between relubrication
- Low coefficient of traction which can lead to reduced energy consumption potential
- Outstanding low temperature pumpability ensuring easier low temperature start-up and lower running torque

Applications:

Mobiltemp SHC greases offer excellent high temperature grease life, bearing protection and grease integrity along with excellent low temperature capability and good wear protection.

For Mobiltemp SHC 32:

- Sealed or re-packable ball and roller bearings
- Splines, screws and some enclosed gearing
- Extreme temperature applications with a recommended operating temperature range of -50ºC to 180ºC (with appropriate relubrication intervals)

For Mobiltemp SHC 100

- High speed bearings and thrust bearings where a wide temperature range is desired
- It is particularly suitable for use in electric motor bearings where operating conditions demand reduced friction, low wear and long service life
- Extreme temperature applications with a recommended operating temperature range of -50ºC to 200ºC (with appropriate relubrication intervals)

For Mobiltemp SHC 460 Special

- The presence of molybdenum disulphide makes it particularly suitable for the lubrication of sliding machine elements such as cams and ways, which are subject to long relubrication intervals, limited motion or shock loading
- Oven conveyor or kiln bearings which are subject to high temperatures or cycling between high and normal temperatures
- Extreme temperature applications with a recommended operating temperature range of -40ºC to 180ºC (with appropriate relubrication intervals)

Product Name	NLGI Grade
Mobiltemp SHC 32	1.5
Mobiltemp SHC 100	2
Mobiltemp SHC 460 Special	1

Beacon™ 325

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 characterised 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.

Beacon 325 provides excellent service in a wide variety of small bearings and small, lightly loaded gears that operate over a wide temperature range. Its long lubrication life and excellent oxidation stability well suit it for use as a bearing lubricant in sealed-for-life units in automotive, aircraft and industrial applications. The recommended application temperature range for continuous operation for Beacon 325 is -50ºC to 120ºC.

Advantages and Potential Benefits:

A key feature of Beacon 325 is its use of a synthetic fluid to provide optimum performance for low temperature precision applications.

- Special synthetic base oil provides excellent low-torque and low temperature properties
- Excellent oxidation stability for extended grease life needed for filled for life applications
- Very good water resistance ensures proper lubrication even in the presence of incidental water contamination
- Low volatility base oil permits operation at moderate to high temperature without fluid evaporation

Applications:

Beacon 325 provides excellent service in a wide variety of small bearings and lightly loaded gears that operate over a wide temperature range, including such applications as:

- Naval, marine, and aircraft instruments and control mechanisms
- Geared limit switches in Limitorque valve actuators
- Commercial and military electronic equipment
- Sealed for life motors, generators, and similar equipment in automotive, aviation and industrial applications

Product Name	NLGI Grade
Beacon 325	2

Mobilgrease™ FM 222

Mobilgrease FM 222 is a high performance multi-purpose product designed specifically for the lubrication of food processing machinery. Mobilgrease FM 222 is formulated with components meeting the requirements of CFR 178.3570, Chapter 21, and are NSF registered is a H1 classified lubricant.

Food processing equipment often operates in a variety of environments, covering the extremes of temperatures from oven to freezer operations, as well as a high level of contamination from water, steam and cleaning agents. Mobilgrease FM 222 was developed as multipurpose grease lubricants capable of providing excellent lubrication in all of these environments. Mobilgrease FM 222 is engineered with excellent water resistance to withstand periodic washdown and cleaning operations frequent in the food processing industry. Rust inhibition is a critical property for the industry. Mobilgrease FM 222 is formulated with an excellent rust inhibition package which, working in concert with the water resistance properties, will provide protection against rust. The select base oils coupled with excellent thickener shear stability translates into an ability to provide lubrication over a wide range of speeds, loads and temperatures. Mobilgrease FM 222 is also formulated to handle a variety of loads, exhibiting good protection against wear and shock load conditions.

- NSF H1 Registered
- DIN 51825 KPF2K-20
- Kosher / Parve / Halal

Advantages and Potential Benefits:

Mobilgrease FM 222 grease has been designed specifically to meet the needs of the food processing industry that requires excellent water resistance, rust protection and a lubricant able to provide oil to the load zones reliably under high shear conditions.

- Excellent water resistance and rust protection, helping provide superb equipment protection during frequent equipment cleaning operations
- Excellent thickener shear stability, ensuring product exhibits excellent stability for long periods of time, helping to provide oil more consistently between relubrication cycles
- NSF H1 registered, DIN 51825 certified, Kosher/Parve, Halal and engineered to meet global requirements, presenting a multi-purpose solution to the food processing industry around the world
- Manufactured in facilities registered to ISO 21469, product integrity assurance through independent verification

Applications:

Mobilgrease FM 222 is recommended for multi-purpose lubrication of food processing equipment where NSF H1 registration is required. The food industry includes food processing, beverage, medical and packing industries for a wide range of cultures.

Applications include:

- General rotating equipment lubrication
- Conveyor bearings
- Anti-friction roller bearings under heavy or shock loading
- Linkages and slides
- Joints

Product Name	NLGI Grade
Mobilgrease FM 222	2

Mobilgrease XHP™ 220 Series

Mobilgrease XHP 220 greases are designed to outperform 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. Their performance features make them ideal choices for operating conditions including high temperature, water contamination, shock loading and extended re-lubrication operations. These greases have a high level of chemical stability and offer excellent protection against rust and corrosion.

Mobilgrease XHP 220 greases are designed for a wide range of applications including the industrial, automotive, construction and marine sectors. Mobilgrease XHP 222 Special is an extreme pressure grease fortified with 0.75% molybdenum disulfide that provides protection from wear under conditions pivoting and other conditions that lead to loss of oil film.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity
- Excellent grease tenacity reduces leakage
- Extended service intervals reduce maintenance costs
- Optimum performance in hostile aqueous environments

Applications:

- Mobilgrease XHP 220: is a softer, high-temperature grease for centralized grease application systems, gear lubrication, and where extreme-cold-temperature pumpability is important
- Mobilgrease XHP 221: Industrial and marine applications, chassis components and farm equipment. It provides excellent low temperature performance
- Mobilgrease XHP 222: Industrial and marine applications, chassis components and farm equipment. Its sticky formulation stays in applications longer
- Mobilgrease XHP 222 Special: Contains moly, recommended for moderate duty service in industrial applications, chassis components and farm equipment. It also finds application in king pins, U-joints, fifth wheels and bucket pins

Product Name	NLGI Grade
Mobilgrease XHP 220	0
Mobilgrease XHP 221	1
Mobilgrease XHP 222	2
Mobilgrease XHP 222 Special	2

Mobilgrease XHP™ 462

Mobilgrease XHP 462 is extended service lithium complex grease intended for a wide variety of heavy duty applications and operating conditions. Mobilgrease XHP 462 was designed to outperform conventional products by applying cutting edge, proprietary, lithium complex manufacturing technology. Mobilgrease XHP 462 is formulated to provide excellent high temperature performance with superb adhesion, structural stability and resistance to water contamination. Mobilgrease XHP 462 has a high level of chemical stability and offer excellent protection against rust and corrosion. Mobilgrease XHP 462 features a high dropping point and maximum recommended operating temperature of 140º C.

Advantages and Potential Benefits:

- Superb resistance to water washout and spray-off helps assure proper lubrication and protection even in the most severe water exposure conditions
- Highly adhesive and cohesive structure gives excellent grease tenacity, helps reduce leakage and extend re-lubrication intervals to help reduce maintenance requirements
- Excellent rust and corrosion resistance offers protection of lubricated parts even in hostile aqueous environments
- Very good resistance to thermal, oxidative and structural degradation at high temperature, helps extend grease life and enhance bearing protection in high temperature applications offers reduced maintenance and replacement cost benefits
- Very good anti-wear and EP performance gives reliable protection of lubricated equipment, even under conditions of high sliding with potential for extended equipment life and reduced unanticipated downtime
- Broad multi-purpose application, provides potential for inventory rationalization and reduced inventory costs

Applications:

- Mobilgrease XHP 462 can be used in a wide range of equipment including industrial, automotive, construction and marine applications
- The performance features of Mobilgrease XHP 462 makes it the ideal choices for operating conditions including high temperature, water contamination, shock loading and extended re-lubrication operations
- Mobilgrease XHP 462 has been shown to provide excellent lubrication of felt roll bearings, wet end bearings, and press section bearings
- It is also an outstanding multi-purpose grease for general mill applications and industrial and marine applications, construction, and mining industries, as well as off-highway vehicles and farm equipment

Product Name	NLGI Grade
Mobilgrease XHP 462	2

Mobilgrease XHP™ 681 Mine

Mobilgrease XHP 681 Mine, a member of the Mobilgrease XHP family, is a highly specialized grease engineered to handle the lubrication demands of off-road equipment used in the mining industry. Using the same leading edge, proprietary lithium complex technology, Mobilgrease XHP 681 Mine utilizes an ISO 680 viscosity and a polymer-enhanced backbone to provide the water resistance and wet shear stability critical to successful grease lubrication for this environment. The AW/EP additive system coupled with 5% molybdenum disulfide loading provides balanced load-carrying capability across a spectrum of load, speed and temperature conditions, all prevalent in mining equipment used in the job of digging and hauling mineral deposits on a daily basis. Additionally, Mobilgrease XHP 681 Mine has exceptional staying power and extended service capabilities with very good water wash-out, spray-off, will not corrode steel or copper bearing alloys, is compatible with conventional sealing materials. All of this performance does not come at the expense of pumping characteristics, as Mobilgrease XHP 681 Mine retains good mobility even at moderately low temperatures.

Advantages and Potential Benefits:

A key factor in the excellent adhesion and cohesion properties and high drop point of Mobilgrease XHP 681 Mine is the proprietary manufacturing technology developed at our research facilities and adopted by our modern manufacturing facilities. Mobilgrease XHP 681 Mine uses specially selected additives to provide excellent oxidation stability, rust and corrosion control, resistance to water contamination as well as anti-wear and EP protection.

- Superb resistance to water washout and spray-off helps assure proper lubrication and protection even in the most severe water exposure conditions
- Highly adhesive and cohesive structure provides excellent grease tenacity helps reduce leakage and extend re-lubrication intervals for reduced maintenance requirements
- Excellent rust and corrosion resistance helps protect lubricated parts even in hostile aqueous environments, especially acidic water
- Very good resistance to thermal, oxidative and structural degradation at high temperature extends grease life and enhances bearing protection in high temperature applications and helps reduce maintenance and replacement costs
- Very good anti-wear and EP performance, provides reliable protection of lubricated equipment, even under conditions of high sliding and shock loading with potential for extended equipment life and reduced unanticipated downtime

Applications:

- Mobilgrease XHP 681 Mine is designed primarily for use in the mining industry where it is recommended by ExxonMobil for the lubrication of slow moving plain and rolling element bearings. It will provide extraordinary performance in contractor, construction, earthmoving, mobile and stationary equipment particularly where long lubrication intervals or oscillating/vibrating motion is present.

Product Name	NLGI Grade
Mobilgrease XHP 681 Mine	1

Mobilgrease™ CM-P

Mobilgrease CM-P is extra high performance extreme-pressure grease. Mobilgrease CM-P exhibits excellent resistance to softening under severe working, and provide good adhesion and cohesion. An extreme-pressure additive provides exceptional protection against wear, while additional additives enhance resistance to high-temperature oxidation and protection against rust. Mobilgrease CM-P provides low-temperature dispensing, very good resistance to water wash off, and long service in bearings operating at high temperatures. Mobilgrease CM-P has outstanding structural and chemical stability. Mobilgrease CM-P won't corrode steel or copper-bearing alloys and are compatible with conventional seal materials.

Mobilgrease CM-P is recommended for use in for highly loaded plain and antifriction bearings and other applications where the three percent molybdenum disulphide and high-temperature thickener system will provide extraordinary performance. The recommended application temperature range for Mobilgrease CM-P is -20ºC to +145ºC.

Advantages and Potential Benefits:

Mobilgrease CM-P is designed specifically to meet the needs of customers with heavily loaded equipment that require high EP/antiwear performance which remain in place even in tough conditions of water wash, high sliding and high temperature.

- Excellent resistance to water, including spray maintains excellent lubrication properties and protects equipment in conditions of water contamination
- Very good EP and anti-wear protection lowers maintenance costs and less unanticipated downtime
- Better stay-put properties at high temperatures leading to excellent performance in high shear, high load applications, especially where grease re-supply is limited
- Resists rust and corrosion and protects equipment in presence of water for reduced maintenance and longer equipment life
- Good pumpability at low temperatures ensures excellent low temperature properties including start-up in remote locations

Applications:

Heavily loaded applications or environments highly contaminated with water, especially in the contractor / mining sector. Specific examples of such applications include:

- Heavy-duty trucks especially, hinge and bucket pins
- Mining and construction equipment

Product Name	NLGI Grade
Mobilgrease CM-P	2

Mobil Dynagear™ 4000

Mobil Dynagear 4000 is a premium performance open gear lubricant designed to provide outstanding protection of heavily loaded open gear sets exposed to a wide range of operating conditions. Mobil Dynagear 4000 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. Mobil Dynagear 4000 is formulated solvent free and provides excellent dispensability without the use of chlorinated or hydrocarbon solvents.

The Mobil Dynagear 4000 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. Mobil Dynagear 4000 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 4000 does not contain carbon black or asphalt. Additionally, the Mobil Dynagear 4000 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 4000 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.

Advantages and Potential Benefits:

Mobil Dynagear 4000 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.

- Solvent free formulation gives a higher lubricant flash points which can help improve safety performance and reduce waste and associated disposal costs
- Asphalt free formulation, helps maintain system cleanliness, clean spray nozzles, prevents root build up and prevent flaking
- Excellent water resistance allows for exceptional “Stay in Place” performance and the ability to absorb moderate amounts of water with little change to the lubricant film
- Excellent anti-rust, corrosion control leading to long life for protected parts helps reduce maintenance associated with damaged surfaces
- Very good low temperature pumpability and mobility for use in centralized systems, providing excellent low temperature pumpability and start-up performance, a key feature for remote applications
- Powerful EP (extreme pressure) protection enhanced with solid lubricants, helps protect mating surfaces against damaging wear in contact zones, helping to extended component life and reduce unplanned maintenance and repairs

Applications:

- Mobil Dynagear 4000 open gear lubricant is recommended for shovel dipper sticks and racks, swing gears (circle), propel system bushings, crowd gears, sheave bearings and undercarriage lubrication points
- Mobil Dynagear 4000 is recommended for the lubrication of the hoist gear on Caterpillar Mining / Bucyrus Electric Shovel Hoist Drum Gear sets and in applications where an extra heavy open gear lubricant is desired
- The Mobil Dynagear 4000 is recommended by ExxonMobil for use in mining, grinding, mill applications and other industrial applications, where the grease is dispensed through central grease systems

Product Name	NLGI Grade
Mobil Dynagear 4000	00.5

Mobil Polyrex™ EM

Super-premium Mobil Polyrex EM grease is 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.

Advantages and Potential Benefits:

- Long service life of ball and roller bearings, particularly in sealed-for-life applications, reduces replacement costs, minimises downtime and increases productivity
- Higher durability under mechanical shear forces, unlike conventional polyurea greases
- Excellent protection against corrosion for optimum performance
- Suitable for lubrication of ball bearings in noise-sensitive applications

Applications:

- Electric motor bearings
- Fin fan bearings
- High-temperature pump bearings
- Factory-filled, sealed-for-life ball bearings
- Ball or roller bearings operating at high temperatures where low oil separation is required
- Mobil Polyrex EM for ball or roller bearings operating in noise sensitive environments

Product Name	NLGI Grade
Mobil Polyrex EM	2

Mobilux™ EP Series

Mobilux EP 0, 1, 2 and 023 are a high performance general purpose industrial greases and special duty semi-fluid greases. These lithium hydroxystearate greases are formulated to provide extra protection against wear, rusting and water washout.

Advantages and Potential Benefits:

- Excellent protection against wear under heavy or shock loading and vibration
- Excellent protection against rust and corrosion under washouts
- Good pumpability in centralised systems (Mobilux EP 0 and 1)
- Effective leakage control (Mobilux EP 023)

Applications:

- Mobilux EP 0 and EP 1: Suitable for centralised lubrication systems and other applications where low temperature performance is required
- Mobilux EP 2: Multi-purpose applications in anti-friction and plain bearings, bushings and pins under normal operating conditions
- Mobilux EP 023: Enclosed gears and bearings in poorly sealed gear cases on most underground mining machinery with the exception of electric motor gearings

Product Name	NLGI Grade
Mobilux EP 0	0
Mobilux EP 023	000
Mobilux EP 1	1
Mobilux EP 2	2

Mobilux™ EP 111

Mobilux EP 111 is an extra high performance grease designed for all designs of couplings. It is formulated to resist centrifugal separation of the oil from the soap thickener at extremely high rotating speeds, ensuring effective lubrication and protection against wear even in heavily loaded misaligned gear couplings. Mobilux EP 111 can also be used in low speed open gearing and plain bearings.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity
- Excellent protection for optimum performance
- Effective leakage control and reduced lubricant consumption
- Optimum performance in hostile aqueous environments

Applications:

- Gear and grid couplings
- Spring and slipper joint couplings
- Spindle (gear) and chain couplings
- Low speed open gears and plain bearings

Product Name	NLGI Grade
Mobilux EP 111	1

Greases Typical Properties

Application Product Name	Thickener Type	Colour Visual	Worked Penetration	Viscosity cSt at 40˚C	NLGI Grade
Mobil SHC Polyrex 462	Polyurea	White	280	460	2
Mobil SHC Grease 460 WT	Lithium Complex	Red	305	460	1.5
Mobilith SHC 100	Lithium Complex	Red	280	100	2
Mobilith SHC 220	Lithium Complex	Red	280	220	2
Mobilith SHC 221	Lithium Complex	Light Tan	325	220	1
Mobilith SHC 460	Lithium Complex	Red	305	460	1.5
Mobilith SHC 1500	Lithium Complex	Red	305	1500	1.5
Mobilith SHC 007	Lithium Complex	Red	415	460	00
Mobilgrease 33	Lithium Complex	Blue - Green	292	12.5	1.5
Mobilgrease 28	Clay	Dark Red	293	30	1.5
Mobil Aviation Grease SHC 100	Lithium Complex	Red	280	100	2
Mobilith SHC PM 460	Lithium Complex	Off White	305	460	1.5
Mobiltemp SHC 32	Clay	Red	315	32	1.5
Mobiltemp SHC 100	Clay	Light Brown	280	100	2
Mobiltemp 460 Special	Clay	Grey	325	460	1
Beacon 325	Lithium	Tan	285	12	2
Mobilgrease FM 222	Aluminum Complex	White	280	220	2
Mobilgrease XHP 220	Lithium Complex	Dark Blue	370	220	0
Mobilgrease XHP 221	Lithium Complex	Dark Blue	325	220	1
Mobilgrease XHP 222	Lithium Complex	Dark Blue	280	220	2
Mobilgrease XHP 222 Special	Lithium Complex	Grey	280	220	2
Mobilgrease XHP 462	Lithium Complex	Dark Blue	280	460	2
Mobilgrease XHP 681 Mine	Lithium Complex	Grey	325	680	1
Mobilgrease CM-P	Lithium Complex	Grey	280	320	2
Mobil Dynagear 4000	Lithium	Black	390	4000	00.5
Mobil Polyrex EM	Polyurea	Blue	285	115	2
Mobilux EP 023	Lithium	Brown	460	320	000
Mobilux EP 0	Lithium	Brown	370	160	0
Mobilux EP 1	Lithium	Brown	325	160	1
Mobilux EP 2	Lithium	Brown	280	160	2
Mobilux EP 111	Lithium	Black	325	-	1

Food Machinery
Oils

Mobil SHC Cibus™ Series

Mobil SHC Cibus Series are supreme performance hydraulic, compressor, 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.

Mobil SHC Cibus lubricants are NSF H1 registered lubricants and also comply with Title 21 CFR 178.3570 by the Food and Drug Administration (USA) for lubricants with incidental food contact. They are also suitable for Kosher and Halal food preparation for multi-faith applications and to offer processing engineers maximum flexibility during operations.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity
- Excellent protection against rust and corrosion under washouts
- Optimum efficiency in sliding mechanisms reduces energy consumption and operating temperatures
- Multi-purpose capability reduces inventory costs and lowers chances of misapplication
- Suitable for use in food and beverage packaging and processing applications where incidental food contact can occur

Applications:

- Mobil SHC Cibus 32, 46 and 68: hydraulic, circulating, compressor and vacuum pump applications
- Mobil SHC Cibus 150, 220, 320 and 460: gear, bearing and circulating systems

Product Name	ISO VG
Mobil SHC Cibus 32	32
Mobil SHC Cibus 46	46
Mobil SHC Cibus 68	68
Mobil SHC Cibus 150	150
Mobil SHC Cibus 220	220
Mobil SHC Cibus 320	320
Mobil SHC Cibus 460	460

Food Machinery Oils Typical Properties

Application Product Name	Specific Gravity	Pour °C	Flash °C	Viscosity		V.I.	ISO VG
				cSt at 40°C	cSt at 100°C		
Mobil SHC Cibus 32	0.82	-54	244	30	5.8	134	32
Mobil SHC Cibus 46	0.83	-51	244	46	7.7	140	46
Mobil SHC Cibus 68	0.84	-48	258	68	10.4	140	68
Mobil SHC Cibus 150	0.84	-21	226	162	20.7	150	150
Mobil SHC Cibus 220	0.84	-24	274	222	24.5	139	220
Mobil SHC Cibus 320	0.85	-42	284	311	32.7	147	320
Mobil SHC Cibus 460	0.86	-42	294	458	43.6	148	460

Hydraulic Oils

Mobil SHC™ 500 Series

Mobil SHC 500 oils are supreme performance hydraulic oils formulated from synthesised, wax-free hydrocarbon base fluids combined with a carefully engineered super-stabilised additive system.

They are exceptionally high quality, wide temperature, shear stable hydraulic oils with controlled low temperature pumpability properties and maximised anti-wear protection for high pressure vane, piston and gear pumps. Mobil SHC 500 oils provide long oil/filter life and optimum equipment protection to reduce maintenance and product disposal costs.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity
- Extended service intervals reduce maintenance costs
- Increased operating capacity, even at high temperatures and low torque
- Reliable flow and lubrication for easy startup, even at low temperatures
- Improved filterability for cleaner systems and reduced close-tolerance valve sticking
- Reduced foaming

Applications:

- Hydraulic systems prone to deposit build-up such as sophisticated Numerically Controlled (NC) machines, particularly where close clearance servo-valves are used
- Systems employing multi-metal component designs
- High pressure vane, piston and gear pumps
- Systems where cold start-up and/or very high operating temperatures are typical
- Systems containing gears and bearings

Product Name	ISO VG
Mobil SHC 524	32
Mobil SHC 525	46
Mobil SHC 526	68

Mobil DTE 10 Excel™ Series

Mobil DTE 10 Excel is a line of high performance anti-wear hydraulic oils designed to meet the needs of modern, high pressure, industrial and mobile equipment hydraulic systems.

Mobil DTE 10 Excel's patent-pending formulation is constructed from carefully selected base oils and a proprietary additive system to provide well balanced performance in a range of applications. The products exhibit exceptional oxidation and thermal stability, allowing long oil life and minimising deposit formation in severe hydraulic systems using high pressure, high output pumps. The innovative cleaning properties protect critical hydraulic system components from malfunction, such as tight tolerance servo and proportional valves found in many modern hydraulic systems. The high shear stable viscosity index allows for a wide operating temperature range, maintaining maximum hydraulic efficiency and component protection at both low and high temperatures. Outstanding air release properties provide an added measure of protection in systems with low residence time. This helps prevent cavitations and microdieseling. The non-zinc anti-wear system provides a high degree of protection in gear, vane and piston pumps while also minimising deposit formation.

Advantages and Potential Benefits:

- Reduced formation of sludge and deposits for trouble-free operation and long filter life
- Excellent protection over a wide temperature range
- Long fluid life even under harsh operating conditions
- Outstanding seal life reduces leakage, oil consumption and contamination ingress reduce maintenance costs
- Lower energy consumption and higher system responsiveness
- Prevention of aeration and cavitation damage in low residence time systems

Applications:

- Industrial and mobile equipment hydraulic systems operating at high pressures and temperatures in critical applications
- Hydraulic systems subject to deposit build-up such as sophisticated Computer Numerically Controlled (CNC) machines, particularly where close clearance servo-valves are used
- Systems requiring a high degree of load carrying capability and anti-wear protection

Product Name	ISO VG
Mobil DTE 10 Excel 15	15
Mobil DTE 10 Excel 32	32
Mobil DTE 10 Excel 46	46
Mobil DTE 10 Excel 68	68
Mobil DTE 10 Excel 100	100
Mobil DTE 10 Excel 150	150

Mobil DTE™ 20 Series

Mobil DTE 20 oils are supreme performance anti-wear hydraulic oils designed to meet a wide range of hydraulic equipment requirements. Mobil DTE 20 oils are formulated with high quality base oils and a super stabilised additive system that neutralises the formation of corrosive materials. They are designed to work with systems operating under severe conditions where high levels of anti-wear and film strength protection are needed. Yet, they are also formulated to work where non-anti-wear hydraulic oils are generally recommended.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity
- Reduced formation of sludge and deposits for trouble-free operation and long filter life
- Excellent protection of systems using various metallurgy
- Excellent protection of critical components such as servo-valves
- Reduced foaming

Applications:

- Hydraulic systems critical to deposit build-up such as sophisticated Computer Numerically Controlled (CNC) machines, particularly where close clearance servo-valves are used
- Applications where sludge and deposits form with conventional products
- Systems requiring a high degree of load carrying capability and anti-wear protection

Product Name	ISO VG
Mobil DTE 24	32
Mobil DTE 25	46
Mobil DTE 26	68
Mobil DTE 27	100
Mobil DTE 28	150

Nuto™ H Series

Nuto™ H Series oils are premium quality anti-wear hydraulic oils intended for industrial and mobile service applications where anti-wear lubricants are required. They are formulated with high quality base oils and a select additive system that results in products that provide many desirable features to improve and prolong equipment life. Nuto H Series oils are designed to provide good performance in a range of hydraulic components used in systems subjected to moderate to severe operating conditions. These products meet the performance requirements of a wide range of hydraulic system and component OEM's.

Advantages and Potential Benefits:

The Nuto H Series hydraulic oils help reduce the potential for wear and corrosion, particularly where water or moisture is present. Their effective oxidation resistance and chemical stability support good oil life in moderate to severe applications. Their high level of anti-wear properties prevents wear in vane, gear and piston pumps used in hydraulic service. Their good demulsibility characteristics permit the oils to work well in systems contaminated with small amounts of water yet readily separate large amounts of water.

The Nuto H Series oils offer the following features:

- Good anti-wear performance reducing pump wear and leading to long pump life
- Fast air release, good foam control and good water separability
- Corrosion protection that reduces the negative effects of moisture on system components
- Filterability to prevent filter blockage even in the presence of water
- Effective oxidation and chemical stability characteristics allows good oil and filter life

Applications:

- Systems employing gear, vane, radial and axial piston pumps where anti-wear hydraulic oils are recommended
- Hydraulic applications where contamination or leakage are unavoidable
- Where small amounts of water are unavoidable and this water could damage components
- Systems containing gears and bearings where mild anti-wear characteristics are required
- Applications where thin oil-film corrosion protection is an asset such as systems where small amounts of water exist

Product Name	ISO VG
Nuto H 46	46
Nuto H 68	68
Nuto H 100	100

Mobil EAL™ Hydraulic Oil 46

Mobil EAL Hydraulic Oil 46 is a premium quality, high performance hydraulic oils developed to meet the demand for environmentally acceptable hydraulic fluids. Mobil EAL Hydraulic Oil 46 is based on synthetic, readily biodegradable esters. A high-performance, carefully selected additive package provides excellent anti-wear and extreme pressure (EP) properties as well as good thermal stability and corrosion protection. Inherently strong oxidation resistance helps to prevent gumming and deposit formation even at high temperatures. Because of the high natural VI of the base fluid and low pour point, the viscosity-temperature behaviour allows for a very wide operating temperature range.

Compared to vegetable oil based (HETG) products, HEES (Hydraulic Oil Environmental Synthetic Ester) fluids, such as Mobil EAL Hydraulic Oil 46, can give an overall improved performance and in particular related to higher operating temperatures and better thermal and oxidation resistance.

Advantages and Potential Benefits:

Mobil EAL Hydraulic Oil 46 provides excellent wide temperature range performance. The exceptional anti-wear, lubricity and film strength characteristics assure performance in hydraulic and circulation systems operating under moderate to severe conditions. The ready biodegradability and virtually non-toxic nature of this product make it an excellent choice where leakage or spillage could enter environmentally sensitive areas. The inadvertent leakage of spillage of this product in environmentally sensitive areas could result in easier clean-up and lower remediation costs.

- Readily biodegradable hydraulic oil, reduces potential for environmental damage
- Very low Water Endangering Class - NGW (nicht wassergefährdend), lowers potential remediation and clean-up costs caused by spills or leakage and becomes an integral part of plant environmental programmes
- High viscosity index and low pour point, allows for a wide operating temperature range
- Excellent water Demulsibility, avoids deposit formation and filter plugging for enhanced equipment reliability
- Outstanding corrosion protection and multi metal compatibility, reduces corrosion of internal system components
- Will not react with steel or copper alloys
- Excellent anti-wear/EP properties, protects system components against wear and scuffing, providing long equipment life
- Rapid air release properties, leading to optimum circulation efficiency and suitability for systems even with small sumps
- Good compatibility with seals and joints and works well with same elastomers used with conventional mineral based oils

Applications:

- Mobil EAL Hydraulic Oil 46 is recommended where there could be accidental fluid loss into the environment or where surface water contamination should be avoided. Application areas include industrial, forestry and marine and particularly in mobile equipment. This can include waste water treatment plants, reservoirs, waterways, parkland, tunnel drilling, forest machines, dredgers, river sluices and harvesting machines, etc. On ships, applications could include bow thrusters, propeller systems and deck machinery
- Mobil EAL Hydraulic Oil 46 is also suitable for use in the power and energy industry, particularly in wind turbine applications

Product Name	ISO VG
Mobil EAL Hydraulic Oil 46	46

Mobil EAL Envirosyn™ 46H

Mobil EAL Envirosyn 46H is a super premium, high performance fully synthetic environmentally aware hydraulic and circulating oil designed to provide outstanding performance in systems operating at moderate to severe conditions. Mobil EAL Envirosyn 46H provides excellent wide temperature range performance above and beyond the capabilities of non-synthetic environmentally aware oils. Mobil EAL Envirosyn 46H provides exceptional anti-wear and film strength characteristics necessary for hydraulic systems operating under high load and high pressures. Mobil EAL Envirosyn 46H 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 design. Mobil EAL Envirosyn 46H also provides very good thin oil film protection against rusting.

Advantages and Potential Benefits:

Mobil EAL Envirosyn 46H provides excellent wide temperature range performance. The exceptional anti-wear, lubricity, and film strength characteristics assure performance in hydraulic and circulation systems operating under moderate to severe conditions. The ready biodegradability and virtually non-toxic nature of this product makes them an excellent choice where leakage or spillage could enter environmentally sensitive areas. The inadvertent leakage of spillage of this product in environmentally sensitive areas could result in easier clean-up and lower remediation costs.

- Ready Biodegradability and Non-Toxicity, reduces potential for environmental damage
- Lowers potential remediation and clean-up costs caused by spills or leakage and becomes an integral part of plant environmental programs
- Excellent Wide-Temperature Range Performance, assures high level system lubrication at high and low temperatures
- High Oxidation Stability, leading to long oil life
- Exceptional Corrosion Protection, reducing corrosion of internal system components
- Excellent Multi-Metal Compatibility, which will not react with steel or copper alloys
- Good Elastomer Compatibility, works well with same elastomers used with conventional mineral based oils. No need for special seals or elastomers

Applications:

- Hydraulic systems where spills or leakage could result in damage to the environment
- In systems where readily biodegradable and virtually non-toxic fluids may be required
- Circulation systems containing gears and bearings where mild extreme-pressure characteristics are desired
- Hydraulic systems operating with oil temperatures in the range of -25ºC to 95ºC
- Marine and mobile equipment operating in environmentally sensitive areas
- Industrial hydraulic systems where leaked or spilled fluids could get into plant effluent

Product Name	ISO VG
Mobil EAL Envirosyn 46H	46

Mobil EAL™ 224H

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. 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.

It is formulated from select, high-quality, high-VI vegetable oils and a specifically engineered additive system to meet or exceed the performance requirements of most hydraulic pump and system builders while satisfying the stringent criteria for biodegradability and toxicity.

Advantages and Potential Benefits:

- Mobil EAL 224H provides excellent anti-wear, lubricity, and film strength performance in hydraulic and circulation systems operating under moderate operating conditions. The ready biodegradability and virtually non-toxic nature of this product makes it an excellent choice where leakage or spillage could enter environmentally sensitive areas. The inadvertent leakage of spillage of this product in environmentally sensitive areas could result in easier clean-up and lower remediation costs
- Ready Biodegradability and Non-Toxicity, reduces potential for environmental damage
- Lowers potential remediation and clean-up costs caused by spills or leakage and becomes an integral part of plant environmental program
- Good Elastomer Compatibility, which works well with same elastomers used with conventional mineral based oils. No need for special seals or elastomers

Applications:

- Hydraulic systems where spills or leakage could result in damage to the environment
- In systems where readily biodegradable and virtually non-toxic fluids may be required
- Gear systems requiring either an ISO VG 32 or 46 oil with mild extreme-pressure characteristics
- Hydraulic systems operating with oil temperatures in the range of -18ºC to 85ºC
- Marine and mobile equipment operating in environmentally sensitive areas
- Industrial hydraulic systems where leaked or spilled fluids could get into plant effluent
- Air line oilers and some limited oil-mist generating systems
- Air-over-hydraulic fluid systems operating in environmentally sensitive areas

Product Name	ISO VG
Mobil EAL 224H	–

Hydraulic Oils Typical Properties

Product Name	Specific Gravity	Pour °C	Flash °C	Viscosity		V.I.	ISO VG
				cSt at 40°C	cSt at 100°C		
Mobil SHC 524	0.85	-56	234	32	6.4	144	32
Mobil SHC 525	0.85	-54	234	46	8.5	154	46
Mobil SHC 526	0.85	-53	240	68	11.5	158	68
Mobil EAL Envirosyn 46H	0.87	-45	260	49	7.8	145	46
Mobil EAL Hydraulic Oil 46	0.92	-39	310	47	9.0	176	46
Mobil DTE 10 Excel 15	0.84	-54	182	16	4.1	168	15
Mobil DTE 10 Excel 32	0.85	-54	250	33	6.6	164	32
Mobil DTE 10 Excel 46	0.85	-45	232	46	8.5	164	46
Mobil DTE 10 Excel 68	0.86	-39	240	68	11.2	156	68
Mobil DTE 10 Excel 100	0.88	-33	258	100	13.0	127	100
Mobil DTE 10 Excel 150	0.88	-30	256	156	17.2	120	150
Mobil DTE 24	0.87	-27	220	32	5.3	98	32
Mobil DTE 25	0.88	-27	232	44	6.7	98	46
Mobil DTE 26	0.88	-21	236	71	8.5	98	68
Mobil DTE 27	0.89	-21	248	95	10.9	98	100
Mobil DTE 28	0.90	-15	276	143	14.3	98	150
Mobil EAL 224H	0.92	-34	294	37	8.3	212	-
Nuto H 46	0.88	-24	226	46	6.7	104	46
Nuto H 68	0.88	-18	234	68	8.5	107	68
Nuto H 100	0.88	-15	242	100	11.1	95	100

Metal Processing
Oils

Mobilcut™ 100

Mobilcut 100 is a high quality multi-purpose water emulsifiable metalworking fluid formulated to form a stable, superior quality, milky emulsion in a wide range of water hardness.

Advantages and Potential Benefits:

- Excellent protection against corrosion on components, fixtures and machinery
- Multi-purpose capability reduces cross-contamination problems

Applications:

- Suitable for a wide range of ferrous and non-ferrous metalworking operations
- Diluted as a 95:5 water-oil mixture, it can also be used as a fire-resistant hydraulic oil
- Manufactured parts can be cleaned and protected against rusting by immersing them in a Mobilcut 100 emulsion at 66 - 82 °C, then allowing the parts to dry

Metal Processing Oils Typical Properties

Product Name	Appearance	Density @ 20˚C	pH @ 5%	Cast Iron Corrosion, Breakpoint
Mobilcut 100	Amber	-	9.2	-

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Refrigeration Compressor Oils

Mobil Gargoyle Arctic SHC™ 200 Series

Mobil Gargoyle Arctic SHC 200 Series is a line of fully synthetic, supreme performance lubricants designed for use in refrigeration compressors and heat pumps. With their naturally high shear stable viscosity index and low temperature fluidity, they are able to perform in severe service conditions beyond the capabilities of conventional mineral oils. Their solubility and miscibility with refrigerants is low, resulting in higher film thickness in the presence of refrigerants under pressure and reduced shaft seal leakage. Their stability and low volatility eliminates "light end stripping" which can occur with conventional mineral oils.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity
- Excellent protection against wear of compressors to extend life
- Reduced wear of bearings
- Reduced formation of lacquer and deposit reduces shaft seal leakage and extends filter life
- Low volatility prevents viscosity build-up and reduces oil consumption
- Outstanding seal life reduces leakage, oil consumption and contamination ingress reduce maintenance costs
- Optimum operating efficiency

Applications:

- Commercial, industrial, heat pump applications and marine refrigeration systems
- Reciprocating and rotary compressor designs
- Recommended for use with the following refrigerants: ammonia and carbon dioxide

Product Name	ISO VG
Mobil Gargoyle Arctic SHC 224	-
Mobil Gargoyle Arctic SHC 226E	68
Mobil Gargoyle Arctic SHC 228	100
Mobil Gargoyle Arctic SHC 230	220
Mobil Gargoyle Arctic SHC 234	-

Mobil Zerice™ S Series

Mobil Serice S68 and 100 are premium quality synthetic refrigeration compressor lubricant. Based on the nature of alkyl benzenes, they have superior miscibility with hydrochlorofluorocarbon (R22), as well as chlorofluorocarbon refrigerants (R 502 and R 12: possibly used on some old refrigerating plants).

This allows them to be used in very low temperature applications, down to -60ºC.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity
- Low pour and flow points for reduced wax precipitation and increased system efficiency
- Miscibility with halocarbon refrigerants for optimum system efficiency

Applications:

- All refrigeration compressor types, reciprocating or rotary screw types
- Well suited for use with hydrochlorofluorocarbon refrigerants but not sulfur dioxide or R134A refrigerants

Product Name	ISO VG
Mobil Zerice S 68	68
Mobil Zerice S 100	100

Mobil Gargoyle™ Arctic Series

Mobil Gargoyle Arctic Oil 300 is a high performance naphthenic mineral oil for use in refrigeration compressors. It has a low pour point and excellent fluidity at very low temperatures by virtue of being almost wax-free. Gargoyle Arctic oils ensure that evaporator tubes are kept clean to improve heat transfer and to reduce downtime for maintenance. They have good chemical stability and are suitable both for cylinder and bearing lubrication.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity
- Excellent low temperature flow and evaporator heat transfer for optimum system efficiency
- Multi-purpose lubrication for cylinders and bearings reduces inventory and lowers chances of misapplication

Applications:

- Large industrial reciprocating and rotary refrigeration compressors
- Industrial applications such as food freezing and cold storage plants
- Marine refrigeration applications
- Used primarily with ammonia refrigerant, but also used with selected halocarbons

Product Name	SAE Grade
Mobil Gargoyle Arctic Oil 300	68

Refrigeration Compressor Oils Typical Properties

Product Name	Specific Gravity	Pour ˚C	Flash ˚C	Viscosity		V.I.	ISO VG
				cSt at 40˚C	cSt at 100˚C		
Mobil Gargoyle Arctic SHC 224	0.82	-54	230	29	5.6	132	-
Mobil Gargoyle Arctic SHC 226E	0.83	-50	266	69	10.1	136	68
Mobil Gargoyle Arctic SHC 228	0.84	-45	255	97	13.7	147	100
Mobil Gargoyle Arctic SHC 230	0.85	-39	260	220	25.0	149	220
Mobil Gargoyle Arctic SHC 234	0.85	-39	280	399	40.0	150	-
Mobil Zerice S 68	-	-27	174	68	6.5	-	68
Mobil Zerice S100	-	-27	186	100	8.0	-	100
Mobil Gargoyle Arctic Oil 300	0.90	-31	200	68	-	-	68

Turbine Oils

Mobil SHC™ 800 Series

Mobil SHC 800 turbine oils are designed to meet the needs of the most severe industrial gas turbine applications with a nominal 10,000 hour TOST life. This innovative product family is formulated from wax-free synthesised hydrocarbons and a unique additive system. The formula provides outstanding low temperature fluidity and exceptional resistance to degradation at high temperatures beyond the capabilities of premium quality mineral oils. Mobil SHC 800 lubricants also provide excellent antiwear properties as well as protection against rust and corrosion, plus good air release performance and resistance to foaming.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity
- Excellent protection at high temperatures for reduced equipment replacement or maintenance costs
- Reduced formation of deposits improve reliability for lower maintenance costs
- Reliable flow and lubrication during cold starts, even at low temperatures
- High level of resistance to heat soak-back after turbine shutdown
- Optimum system efficiency and fewer unplanned stoppages

Applications:

- Severe stationary gas turbine applications, particularly units under 3,000hp, for stand-by power generation
- Industrial gas turbines operating in low ambient temperatures and in remote areas
- Total energy systems

Product Name	ISO VG
Mobil SHC 824	32
Mobil SHC 825	46

Mobil SHC™ 800 Series

Exceptional protection for land-based gas turbines

Outstanding performance

With 95% of new turbine installations calling for natural gas turbines, you need proven lubricants designed to meet the needs of this demanding application. Mobil SHC 800 Series oils are the logical choice. Backed by over 100 years of industry-leading innovation in power-generation lubrication technology and by exceptional research and development in synthetic lubricants, these oils deliver outstanding performance even under mechanical shearing or repeated cycling from high to low temperatures.

Reduced wear

Specially formulated with synthetic hydrocarbon base oils and enhanced additives, Mobil SHC 800 Series oils provide superb wear protection at start-up and at high operating temperatures by maintaining a protective oil film between moving parts over a wider range of operating temperatures than conventional turbine oils. The synthetic base oil ensures low-temperature fluidity unmatched by mineral-oil-based products, a key benefit for remote applications. The high-viscosity index helps minimize wear at high temperatures by maintaining an oil film separating mating parts.

Beyond mineral oils

Even at sustained high operating temperatures, Mobil SHC 800 Series lubricants help reduce the formation of sludge and varnish as compared to conventional turbine oils, helping to keep parts clean and running smoothly, and reducing filter plugging.

The synthetic base oils of Mobil SHC™ 824 and Mobil SHC™ 825 help promote substantially extended oil drain intervals compared to our conventional mineral oil products—helping reduce downtime, inventory costs and used oil disposal costs.

Advancing Productivity™

Safety

Exceptional high-temperature stability and low-temperature fluidity help extend oil drain intervals, helping reduce employee interaction with equipment, thereby mitigating potential for employee injury.

Environmental Care*

High-viscosity index and deposit control help protect over a wide temperature range, helping to control wear and extend equipment life, minimizing waste generated by equipment replacement and maintenance.

Productivity

Excellent stability under shear and thermal cycling helps provide enhanced equipment protection for extended periods, helping to maximize uptime and enable turbines to operate at peak efficiency.

*Visit mobilindustrial.com to learn how certain Mobil™-branded lubricants may provide benefits to help minimize environmental impact. Actual benefits will depend upon product selected, operating conditions, and applications.

Mobil SHC™ 800 Series

Mobil SHC 800 Series Approvals

	824	825
Mobil SHC 800 Series has the following builder approvals:		
Siemens TLV 9013 04	X	X
Siemens TLV 9013 05	X	X
Alstom HTGD 90 117	X	X
MHI MS04-MA-CL003	X	
Mobil SHC 800 Series meets or exceeds the requirements of:		
Solar ES 9-224, Class 1	X	X
GE GEK 32568G	X	
Mobil SHC 800 Series is recommended by ExxonMobil for use in applications requiring:		
GE GEK 101941A	X	
GE GEK 28143B	X	

Mobil SHC 800 Series Proof of Performance**

Sarpom, GE Frame 6 Gas Turbine

Mobil SHC™ 824 improved unexpected downtime in a GE Frame 6 Gas Turbine operated by Sarpom in Italy. Mineral-oil-based turbine oil typically resulted in six unplanned unit shutdowns per year, but after converting to Mobil SHC 824, Sarpom has experienced no unexpected shutdowns for 24 months, resulting in significant cost saving, and helping to mitigate the frequency of employee/equipment interaction.

Sarpom GE Frame 6 Turbine

Monmouth Energy, Solar Turbine

Monmouth Energy achieved more than 90,000 hours of problem-free operation on a single fill of Mobil SHC 824 in a solar turbine. Exceptional product performance along with ExxonMobil's application expertise and engineering support were noted as key factors in reaching this milestone.

Monmouth Energy's solar turbine recently surpassed 90,000 hours of operation since its last oil change with Mobil SHC 824.

Mobil SHC 800 Series products deliver lasting performance in application

After more than six years of operation in a GE Frame 6B turbine, Mobil SHC 800 Series products continue to deliver high-performance benefits. In-use samples evaluated by the ExxonMobil Lubricants Technical Support (LTS) Laboratory are deemed suitable for continued use based on minimal changes in viscosity, TAN, RPVOT, Foam, RULER, Air Gas Bubble Separation, Additive Component depletion and particle count.

For more information on Mobil SHC™ 800 Series and other Mobil™-branded industrial lubricants and services, please contact your local company representative or visit mobilindustrial.com.

**The Proof of Performances used herein are based on the experiences of the customers mentioned above. Actual results can vary depending upon the type of equipment used and its maintenance, operating conditions and environment, and any prior lubricant used.

Health and Safety.
Based on available information, this product is not expected to produce adverse effects on health when used for the applications referred to above and the recommendations provided in the Material Safety Data Sheet (MSDS) are followed. MSDS's are available upon request through your sales contact office or via the Internet. This product should not be used for purposes other than the applications referred to above. If disposing of used product, take care to protect the environment.

Mobil™ DTE 932 GT

Mobi DTE 932 GT is a next generation high performance turbine oil designed for use in large frame turbines under severe operating conditions. 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.

Mobil DTE 932 GT meets the requirements of modern combustion turbines where the oil is used both as a turbine bearing lubricant as well as for hydraulic controls. Mobil DTE 932 GT is specifically formulated for General Electric Frame 3, 5, 6, 7 and 9 turbines with common bearing and hydraulic oil reservoir, where varnish control is most needed.

The carefully balanced combination of base oils and additives is designed to limit the occurrence of varnish formation in the hydraulic system of these turbines. The keep clean performance in combination with a high level of oxidation and thermal stability help provide long and reliable turbine performance.

Advantages and Potential Benefits:

For modern stationary gas turbines operating at high power outputs, exceptional protection against thermal/oxidative degradation and deposit control are key requirements. Severe operation causes thermal stressing of the lubricant that can result in filter plugging, servo valve deposits or short oil life.

- Excellent thermal/oxidation stability, which helps reduce downtime leading to more reliable operation and helping extend oil charge life enabling lower product costs
- Reduces varnish formation potential, leading to reliable turbine operation and helps reduce maintenance of hydraulic system components
- Excellent foam control and air release for quick start up potential, even at lower ambient temperatures
- Good electrical conductivity which helps reduce varnish formation potential leading to reliable turbine operation and helps reduce maintenance of hydraulic system components

Applications:

Mobil DTE 932 GT is a high performance turbine oil designed for use in gas turbine oil systems, direct- or gear-coupled, and turbine speed control mechanisms. Specific applications include:

- Combustion turbine bearing and hydraulic systems in both power generation and mechanical drive configurations
- Particularly suited for General Electric frame 6, 7 and 9 applications where varnish control of the hydraulic system is desired
- NOT recommended for steam turbine applications

Application Note: Mobil DTE 932 GT is not compatible with Mobil DTE 732. Drain and flush is required when converting.

Product Name	ISO VG
Mobil DTE 932 GT	32

Mobil DTE™ 800 Series

Mobil DTE 832 and 846 are designed for steam turbines, gas turbines and combined cycle gas turbine (CCGT) applications under the most severe operating conditions. These progressive products are based on high quality hydro-treated base stocks for exceptional thermal and oxidation resistance. They are also engineered with specially chosen additives to provide deposit control and cleaning performance required by severe duty gas turbines. They also have excellent water separation properties necessary for steam turbine operation. The formulations also include a non-zinc anti-wear system to meet the load carrying requirements of geared turbines.

Mobil DTE 800 oils also make excellent choices for combined cycle applications that require a single oil for a gas turbine and a steam turbine to run in tandem. The excellent thermal and oxidation resistance of Mobil DTE 832 and 846 ensures operational efficiency in the most severe turbine environments.

The performance features of Mobil DTE 800 oils translate into excellent equipment protection and reliable operation with reduced downtime and extended oil charge life. These products also provide flexibility because they can be used in all turbine types: steam, gas and geared-turbines.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity
- Excellent protection for reduced equipment replacement or maintenance costs
- Optimum system efficiency and fewer unplanned stoppages

Applications:

- Combined cycle (CCGT) electric power generation applications, including those with a common circulation system for the steam turbine and gas turbine
- Lubrication of steam turbine or gas turbine units used for electric power generation, natural gas pipeline transmission, process operations and cogeneration plants

Product Name	ISO VG
Mobil DTE 832	32
Mobil DTE 846	46

Mobil DTE™ 732 M

Mobil DTE 732 M is next generation 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.

Advantages and Potential Benefits:

- Excellent chemical and oxidation stability help reduce maintenance downtime and costs by contributing to system cleanliness and deposit reduction, which can enable long oil and filter life
- High resistance to foaming and rapid air release prevent pump cavitation, noisy and erratic operation, which can help reduce pump replacement and increase pump efficiency
- Reduces varnish formation potential, which can help to increase turbine operation reliability and reduce maintenance costs

Applications:

Mobil DTE 732 M is a high performance turbine oil designed for use in non-geared gas & steam turbine and turbine compressor applications. Specific applications include:

- Steam Turbines – all non-geared
- Gas Turbines – all non-geared, including 501F & G series, 701F & G Series
- Turbine Compressors – all non-geared

Product Name	SAE Grade
Mobil DTE 732M	32

Mobil DTE™ 700 Series

Mobil DTE 700 are non-zinc turbine lubricants designed for gas and steam turbine applications. Mobil DTE 700 lubricants are formulated with carefully selected base stocks and additives, including anti-oxidants, rust and corrosion inhibitors as well as anti-foam agents. These components provide outstanding resistance to oxidation and chemical degradation over time. Mobil DTE 700 lubricants exhibit excellent water separation properties, resistance to emulsion formation and anti-foaming characteristics for reliable operation. Their enhanced air release properties are critical for turbine hydraulic control mechanisms.

The performance features of Mobil DTE 700 oils translate into excellent equipment protection to increase turbine operation reliability, reduce downtime and extend oil charge life. Mobil DTE 700's performance is equipped to meet or exceed a wide range of industry standards and equipment builder specifications for steam and gas turbines used around the world.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity
- Excellent protection against corrosion for reduced equipment replacement or maintenance costs
- Reduced formation of deposits, filter plugging and equipment fouling
- Increased pump efficiency and protection against pump cavitation
- High turbine system reliability

Applications:

- Electric power generation for high output base load utilities
- Gas turbine combined cycle power plants operating in base load or peak generation modes
- Gas turbines in captive power plants
- Gas or steam turbine prime movers
- Hydroelectric turbine applications

Product Name	ISO VG
Mobil DTE 732	32
Mobil DTE 746	46

Turbine Oils Typical Properties

Product Name	Specific Gravity	Pour °C	Flash °C	Viscosity cSt at 40°C	Viscosity cSt at 100°C	V.I.	ISO VG
Mobil SHC 824	0.83	-54	248	32	5.9	135	32
Mobil SHC 825	0.83	-45	248	44	7.9	145	46
Mobil DTE 932 GT	0.84	-18	240	32	6.1	141	32
Mobil DTE 832	0.86	-30	224	30	5.4	110	32
Mobil DTE 846	0.87	-30	244	42	6.2	106	46
Mobil DTE 732M	-	-15	233	31	5.8	131	32
Mobil DTE 732	0.85	-30	228	30	5.5	117	32
Mobil DTE 746	0.86	-30	230	44	6.8	113	46

Way Oils

Mobil Vactra™ Oil Numbered Series

The 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. The Mobil Vactra Oil Numbered Series are carefully formulated from high-quality base stocks and performance balanced with an advanced additive system that provides controlled frictional properties, outstanding aqueous metal working fluid compatibility and corrosion protection of parts and equipment. The unique additive package provides exceptional frictional properties on a wide variety of way materials, including steel on steel and steel on polymer, reducing stick-slip and chatter. The Mobil Vactra Oil Numbered Series have been optimized to provide excellent separability from aqueous coolants while minimizing the corrosive effects of high pH coolants on lubricated surfaces.

Advantages and Potential Benefits:

- Exceptional frictional characteristics helps eliminate stick slip and allows consistently accurate machining
- Multi-material capabilities allows for product consolidation
- Excellent water separability helps improve the life and performance of aqueous coolants
- Adhesiveness prevents removal of lubricant from critical surfaces
- Long term rust and corrosion protection helps reduce the deterioration of sliding surfaces in the presence of water and aqueous coolants
- Hydraulic and gear capabilities allows for product consolidation

Applications:

- Mobil Vactra Oil No. 2: Horizontal slideways on small to medium size machine tools; also suitable for circulating application in large machines and as moderate duty hydraulic fluids
- Mobil Vactra Oil No. 4: Large machines where way pressures are high or good precision is required as well as vertical and inclined slideways where drain-down can be a problem and for moderate service machine tool gear drive mechanisms
- Ball screws, linear guides, headstocks, translating screws
- Applications where conventional mineral oil contamination of the aqueous coolants shortens coolant batch life

Product Name	ISO VG
Mobil Vactra Oil No. 2	68
Mobil Vactra Oil No. 4	220

Mobil Vacuoline™ 1405

Mobil Vacuoline 1405 is an extra high performance lubricant designed for machine tools that use one oil for both hydraulic systems and way lubrication. It is formulated with 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. This product meets the low frictional properties required to assure acceptable production levels of quality parts with minimum downtime in today's high output machine tools.

Advantages and Potential Benefits:

- Improved surface finish and dimensional accuracy reduce formation of built-up edge to increase quality of finished materials
- Excellent protection against rust, wear and corrosion reduces maintenance costs
- Minimal chatter and stick-slip of slides and ways
- Enhanced aqueous coolant service life and performance.

Applications:

- Machine tools with a common system for hydraulics and way lubrication
- Applications where cross-contamination of way lube with hydraulic oil can result in poor performance
- Machinery with separate systems for ways and hydraulics where one oil is desirable for both systems
- Areas where conventional mineral based lubricants are not adequately protecting way surfaces

Product Name	ISO VG
Mobil Vacuoline 1405	32

Way Oils Typical Properties

Product Name	Specific Gravity	Pour °C	Flash °C	Viscosity		V.I.	ISO VG
				cSt at 40°C	cSt at 100°C		
Mobil Vactra Oil No. 2	0.88	-18	228	68	8.9	105	68
Mobil Vactra Oil No. 4	0.89	-3	240	220	18.6	100	220
Mobil Vacuoline 1405	-	-12	210	32	5.3	96	32

Marine Oils

Mobilgard™ 1 SHC

Mobilgard 1 SHC by ExxonMobil is a supreme performance, synthetic diesel engine oil specifically formulated to address the needs of high power, distillate fueled diesel engines. It provides unsurpassed lubrication including long drain capability and extended engine life for today's marine diesel engines operating in severe applications.

A true SAE 40 grade lubricant, on very hot engine parts, it provides stronger lubrication film strength than most SAE 50 engine oils. At low temperatures, it flows like an SAE 20W product and thus provides outstanding start-up reliability and wear protection at extreme low temperatures as low as -54ºC.

Advantages and Potential Benefits:

- Modern high performance, low emission, diesel engines in severe-service applications significantly increase the demands on engine lubricants. Current engine designs are tighter, reducing oil consumption and resulting in less fresh oil make-up to replenish depleted additives. Top piston rings may be located higher bringing the oil film closer to the combustion chamber where temperatures increase thermal stress on the lubricant. Higher fuel injector pressure and retarded timing improve control of exhaust emissions, but also increase engine temperatures and increase soot loads in engines operating with exhaust gas re-circulation
- Mobilgard 1 SHC is also environmentally friendly in that it can significantly extend oil drain intervals beyond conventional oils which reduces waste oil disposal. In addition, the formulation is designed without the use of zinc and with low chlorine levels well below the most stringent regulations in effect today
- Exceptional thermal and oxidation stability minimises high temperature deposit formation, bore polish, varnish and sludge build-up and extends oil drain and service periods
- Enhanced frictional properties helps maintain effective oil film under severe operation and improves fuel economy
- Outstanding high and low temperature performance allows a wide temperature and operating application range and offers quick start-up and immediate oil circulation at low ambient temps
- Low volatility means reduced oil consumption

Applications:

Mobilgard 1 SHC is recommended for use as a crankcase lubricant in medium and high speed diesel engines in severe marine service. It is especially suited to the needs of high power concentration engines where thermal stress and loading on the lubricant are severe, as well as for applications involving low-temperature and /or frequent start-up, rapid loading following rapid start-up, and abrupt shutdown after high speed operations. Specific applications include:

- Military patrol vessels, high speed ferry/passenger vessels, racing boats and luxury yachts
- Life and rescue boat engines, emergency generators, auxiliary engines
- Marine gearing applications where FZG Level 12 is required
- Fully compatible with conventional mineral oils and mineral oil systems
- Can be used in confidence in engines containing silver bearing components due to non-zinc formulation

Product Name	SAE Grade
Mobilgard 1 SHC	40

Mobilgard™ 570

Mobilgard 570 is a premium quality, extra high performance, marine diesel engine cylinder oil. The outstanding performance of Mobilgard 570 has been demonstrated at the elevated peak firing pressures and liner temperatures found in modern marine two stroke engines. It has an optimum viscosity of over 20 cSt. at 100ºC and low volatility to ensure excellent lubricant distribution and oil film retention. Through the use of unique synthetic thickener technology and a balanced formulation, the high viscosity and low volatility is attained with little or no use of bright stock which can create deposit formation due to poor thermal stability. Mobilgard 570 has demonstrated outstanding ring and liner protection and cleanliness under sustained operation with fuel sulphur levels down to 1.5%.

Advantages and Potential Benefits:

- Excellent thermal and oxidation stability can lead to reduced deposits and sludge formation. Cleaner engines can lead to reduced component wear rates
- Exceptional anti-wear properties lead to potentially reduced liner and ring wear and excellent anti-scuffing control
- Outstanding detergency capability leads to potentially cleaner pistons and liners and can help extend periods between overhauls

Applications:

- Marine crosshead engines

Product Name	SAE Grade
Mobilgard 570	50

Mobilgard™ 450 NC

Mobilgard 450 NC (No Chlorine) engine oil is a non-zinc and non-chlorine lubricant formulated with high-quality basestocks which provide low consumption characteristics, high-temperature oxidation resistance, and thermal stability. These basestocks are combined with specially selected stable additives resulting in an engine oil with well-balanced properties.

The detergent/dispersant qualities of Mobilgard 450 NC increases filter life and engine cleanliness. Its sustained high alkalinity provides excellent corrosion protection when using fuels containing up to 1.5 percent sulfur even though metals such as steel, copper, silver and bronze are present. Mobilgard 450 NC has outstanding lubricating properties and provides the necessary protection against corrosion.

Mobilgard 450 NC exhibits superior quality in reduced wear in piston rings and cylinder liners. It possesses good water separating ability.

Advantages and Potential Benefits:

- High thermal and oxidation stability protects against sludge formation in intermittent marine service providing cleaner, smoother running engines
- Effective anti-wear and load carrying properties protects critical wear surfaces and extends engine life
- High TBN and Outstanding TBN Retention helps controls deposits and neutralizes acids produced in the combustion process
- Excellent detergency/dispersancy helps control carbon deposits and varnish formation which can lead to extended oil and filter life

Applications:

- Mobilgard 450 NC engine oil has been specifically formulated to meet requirements of heavily loaded diesel engines manufactured by EMD and used in marine applications
- Mobilgard 450 NC is suitable for other high horsepower marine diesel engines, or higher brake mean effective pressure (BMEP) engines using distillate fuels with a sulfur content up to 1.5 percent
- Mobilgard 450 NC will lubricate such engines in drilling rigs and stationary power generation service as well. Mobilgard 450 NC has been approved by EMD and is recommended for diesel engines manufactured by Alco, Detroit Diesel (API CF-2) and Fairbanks Morse
- Mobilgard 450 NC engine oil meets the requirements of an SAE 40 grade marine diesel engine oil and is suitable wherever API CF and/or CF-2 performance is specified
- Mobilgard 450 NC has quality recognition by EMD, excellent DD6V92 TA test

Product Name	SAE Grade
Mobilgard 450NC	40

Mobilgard™ ADL 40

Mobilgard ADL 40 is a high performance, increased dispersancy engine oil for high BMEP medium and high-speed diesel engines operating on distillate and MDO fuels. As a result of a special balance of detergent and dispersant properties Mobilgard ADL 40 provides 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 40 avoids high oil consumption associated with cylinder liner lacquering, improves overall engine cleanliness and can increase time between engine overhauls. Superior load carrying properties minimise piston ring and liner wear, and also make Mobilgard ADL 40 suitable for marine gearing applications.

Advantages and Potential Benefits:

- Mobilgard ADL 40 has demonstrated superior performance in the latest model diesel engines, including engines of MAN B&W Alpha, Caterpillar (3600 Series), Deutz, and Wartsila. In extensive field testing on these engines, Mobilgard ADL 40 corrected many problems normally associated with severe service engines operating on lower quality fuels. Results included dramatically reduced oil consumption , significantly reduced liner lacquering and extended periods between overhauls
- Increased thermal and oxidation stability leading to improved engine cleanliness, reduced liner lacquering, reduced top deck sludge, reduced piston ring groove deposits and bore polishing
- Superior wear protection extending the life of critical wear surfaces
- Enhanced detergency/dispersancy capability helps reduce deposits especially in the ring belt area which leads to extended cylinder overhauls and reduced oil consumption
- Stay-in-grade shear stability reduces oil consumption and improved bearing protection
- High TBN levels helps prevents corrosive wear due to higher sulphur fuels
- One severe service engine lubricant for all shipboard applications due to a broad range of engine applications

Applications:

- Mobilgard ADL 40 is intended for use in high BMEP engines and in severe duty engine applications where the nature of the fuel and service requires a greater level of detergency/dispersancy and liner lacquer control than is offered by most diesel engine lubricants

Product Name	SAE Grade
Mobilgard ADL 40	40

Mobilgard™ M30 Series

Mobilgard M30 Series (M330 and M430) are premium, extra high performance 30 TBN engine oils designed for use in the most severe residual-fuelled medium-speed diesel applications found in marine and stationary power industries. These outstanding trunk piston engine oils are formulated utilizing high performance 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.

Advantages and Potential Benefits:

Mobilgard M30 Series oils have high performance thermal and oxidation stability. They have excellent TBN retention and resistance to viscosity increases over long operating periods. They also promote a high level of engine cleanliness with protection against wear. Compared to other medium speed engine oils, they have excellent lube/fuel compatibility and separate easily from water.

- Excellent thermal and oxidation stability helps reduced deposits in piston undercrown and ring belt areas
- Improved anti-wear properties, extends the life of critical wear surfaces
- Advanced detergency/dispersancy helps clean camshaft and crankcase spaces
- Outstanding rust and corrosion properties helps protects wear surfaces from water and acidic corrosion
- High Residual Fuel Compatibility reduces sludge formation, longer oil life, cleaner engines
- Excellent TBN Reserve and Retention combats fuel/combustion related corrosion and deposits

Applications:

- Mobilgard M30 Series oils are designed to meet the needs of engines operating on heavy fuel
- Mobilgard M30 Series are recommended for use in the latest model medium speed diesel engines and are especially beneficial in engines having low crankcase oil consumption or operating with low cylinder liner temperatures
- The relatively high alkalinity reserves in these oils provide excellent protection in neutralising the strong acids resulting from the use of high sulphur fuels that find access to the crankcase to promote oil degradation and ring, cylinder, and bearing corrosion

Product Name	SAE Grade
Mobilgard M330	30
Mobilgard M430	30

Mobilgard™ M440

Mobilgard M440 is a premium, extra high performance 40 TBN engine oil designed for use in the most severe residual-fuelled medium-speed diesel applications found in marine and stationary power industries. This outstanding trunk piston engine oil is formulated utilizing the high performance additive detergent technology and provide outstanding residual fuel compatibility characteristics for excellent engine cleanliness, especially in crankcase, camshaft areas, ring belt and piston undercrowns. Mobilgard M440 also demonstrates excellent high temperature oxidation and thermal stability, low volatility, and high load carrying properties and corrosion protection.

Advantages and Potential Benefits:

Mobilgard M440 has outstanding thermal and oxidation stability with excellent TBN retention and resistance to viscosity increases over long operating periods. Mobilgard M440 also promotes a high level of engine cleanliness with protection against wear. Compared to other medium speed engine oils, Mobilgard M440 has excellent lube/fuel compatibility and separate easily from water.

- Excellent thermal and oxidation stability leading to reduced deposits in piston undercrown and ring belt areas
- Improved anti-wear properties helps extends the life of critical wear surfaces
- Advanced detergency/dispersancy cleans camshaft and crankcase spaces
- Outstanding rust and corrosion properties helps protects wear surfaces from water and acidic corrosion
- High residual fuel compatibility means reduced sludge formation, longer oil life, cleaner engines
- Excellent TBN reserve and retention helps combats fuel/combustion related corrosion and deposits

Applications:

- Mobilgard M440 can be used in most medium-speed trunk piston engine applications
- Mobilgard M440 is recommended for use in main propulsion and auxiliary engines on deep-sea vessels; in main propulsion engines on coastal and river ships; and in stationary power plants
- Mobilgard M440 is designed to meet the needs of engines operating on heavy fuel. Mobilgard M440 is recommended for use in the latest model medium speed diesel engines and are especially beneficial in engines having low crankcase oil consumption or operating with low cylinder liner temperatures
- The relatively high alkalinity reserves in this oil provides superior protection in neutralising the strong acids resulting from the use of high sulphur fuels that find access to the crankcase to promote oil degradation and ring, cylinder, and bearing corrosion

Product Name	SAE Grade
Mobilgard M440	40

Mobilgard™ M50

Mobilgard M50 is a premium, extra high performance 50 TBN engine oil designed for use in 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. Mobilgard M50 also demonstrates excellent high temperature oxidation and thermal stability, low volatility, and high load carrying properties and corrosion protection.

Advantages and Potential Benefits:

Mobilgard M50 has industry-leading thermal and oxidation stability. It has excellent TBN retention and resistance to viscosity increases over long operating periods. It also promotes a high level of engine cleanliness with protection against wear. Compared to other medium speed engine oils, it has superior lube/fuel compatibility and separates easily from water.

- Excellent thermal and oxidation stability helps reduce deposits in piston undercrown and ring belt areas
- Improved anti-wear properties extend the life of critical wear surfaces
- Advanced detergency/dispersancy helps clean camshaft and crankcase spaces
- Outstanding rust and corrosion properties helps protects wear surfaces from water and acidic corrosion
- High Residual Fuel Compatibility reduces sludge formation, longer oil life, cleaner engines
- Excellent TBN Reserve and Retention helps combat fuel/combustion related corrosion and deposits

Applications:

- Mobilgard M50 oil can be used in most medium-speed trunk piston engine applications
- Mobilgard M50 is recommended for use in main propulsion and auxiliary engines on deep-sea vessels; in main propulsion engines on coastal and river ships; and in stationary power plants
- Mobilgard M50 oil is designed to meet the needs of engines operating on heavy fuel. It is recommended for use in the latest model medium speed diesel engines and is especially beneficial in engines having low crankcase oil consumption or operating with low cylinder liner temperatures
- In these engines, oil life and drain intervals have been significantly reduced when using conventional lube oils due to severe TBN depletion resulting from very low lube oil consumption
- The relatively high alkalinity reserves in this oil provide superior protection in neutralizing the strong acids resulting from the use of high sulphur fuels that find access to the crankcase to promote oil degradation and ring, cylinder, and bearing corrosion

Product Name	SAE Grade
Mobilgard M50	40

Mobilgard™ 12 Series

Mobilgard 12 Series 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 superior water separating properties and provide excellent corrosion protection.

Advantages and Potential Benefits

Mobilgard 12 Series is formulated with base oils having proven successful performance in diesel engines. The additive system is balanced to provide excellent resistance to thermal degradation under moderately severe operating conditions. They also provide good engine cleanliness and superior wear protection.

- Excellent thermal and oxidation stability helps extend periods between inspections, overhaul and cleaning
- Improved antiwear property helps reduce ring and liner wear
- Excellent TBN reserve and retention allows for increased protection against corrosive wear
- Excellent detergency/dispersancy properties leading to increased oil service life and cleaner engines

Applications:

- The Mobilgard 12 Series diesel engine oils are intended for use as cylinder and bearing lubricants in marine and industrial diesel engines operating on distillate fuels or light fuel blends
- They are particularly effective in small bore, high speed engines in fishing fleets; in new, severe service engines; and in many types of medium speed engines
- Mobilgard 12 Series may be used as crankcase lubricants in large crosshead type diesel engines operating on high sulphur fuels

Product Name	SAE Grade
Mobilgard 312	30
Mobilgard 412	40

Mobilgard™ 300

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 any 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 reduce wear in heavily loaded bearings.

Advantages and Potential Benefits:

Mobilgard 300 is formulated from high quality paraffinic base oils that have excellent thermal stability and oxidation resistance. These base oil characteristics are augmented with a balanced additive system that includes special high temperature oxidation inhibitors, alkaline detergents, a load carrying component and defoamant. The formulation has maximum antiwear properties, good rust protection in the presence of salt water, and excellent water separation characteristics.

- Improved thermal and oxidation stability helps reduce deposits in piston cooling spaces and crankcase and allows for better piston cooling efficiency
- Enhanced detergency gives cleaner crankcases and circulation tanks
- Excellent rust and corrosion properties provide longer bearing life and protect critical bearing surfaces
- Good water tolerance and separation capability allows for effective lubrication in the presence of water leading to longer oil life due to efficient water separation

Applications:

- Mobilgard 300 is recommended primarily for use as system oil in late model, high-output, crosshead diesel engines, especially those engines employing the system oil for piston cooling
- Mobilgard 300 will prevent or reduce deposit formation in the piston cooling spaces, thus maintaining piston cooling efficiency and reducing the incidence of piston top burning and piston crown cracking
- Mobilgard 300 will also prevent or reduce crankcase deposits and will provide outstanding protection for heavily loaded bearings. Its reserve alkalinity allows for the burning of high sulphur fuel
- Good rust prevention and water separation characteristics make Mobilgard 300 an excellent system oil in older design crosshead diesel engines which have water-cooled pistons and where crankcase deposits can be a problem with lower-quality system oils

Product Name	SAE Grade
Mobilgard 300	30

Mobil™ Stern Tube Lubricant

Mobil Stern Tube Lubricant is a high performance, high viscosity lubricant developed especially for the lubrication of Cedervall-type stern tube bearings used in ships and for certain bearings of ships' fin stabilizers. Mobil Stern Tube Lubricant is formulated from relatively high Viscosity Index (VI) base oils combined with emulsifiers, structure modifiers, surface active agents and corrosion preventives. It emulsifies readily with seawater to form a stable water-in-oil emulsion that is adhesive and an excellent lubricant. It provides effective rust protection in the presence of seawater and the lubricating film is resistant to water washing so that corrosion protection is maintained for extended periods under severe operating conditions.

Where the propeller shaft passes through the hull of a ship, it is supported by a bearing that is housed in the stern tube. The Cedervall typebearing, which is a bronze or white metal bearing having an oil-tight inboard seal or stuffing box and metallic outboard seal that is not fully oil-tight, requires a lubricant that readily emulsifies with water. Mobil Stern Tube Lubricant has been formulated to meet this need. With the Cedervall type bearing a high viscosity lubricant generally is supplied to the bearing from a gravity tank.

Advantages and Potential Benefits:

The requirements for lubrication of these three sets of bearings in the stabilizers and stern tubes are sufficiently similar so that a single, carefully formulated lubricant can be used for all of them. To perform satisfactorily, however, the lubricant must have the correct viscosity to flow properly under gravity head without excessive rapid flow that would result in high consumption; must minimize wear under the heavy loads encountered in the bearings; must protect the bearings and other components from corrosion and must emulsify with any seawater that passes the seals in order to maintain lubricating characteristics and minimize corrosion.

In stern tube applications, consumption of the lubricant is a major concern, both from the standpoint of the cost of the lubricant and the cost of labor required to fill the tanks. In two ship trials conducted over an extended period, Mobil Stern tube Lubricant gave significantly reduced consumption compared to the previous formulation, and at least as low as the best competitive product. Throughout the tests, lubrication was entirely satisfactory. These results indicate that Mobil Stern Tube Lubricant provides effective and low cost lubrication of stern tube bearings.

- Selected viscometrics means effective lubrication of critical stabilizer and stern tube components
- Good emulsification properties means the lubricant emulsifies readily to maintain lubrication in the presence of seawater
- Excellent rust and corrosion properties helps protects critical bearing surfaces exposed to seawater
- Multi-use capability reduces the number of lubricants required on-board
- Good viscosity retention in severe applications aids in effective leakage control and reduced oil consumption

Applications:

- Mobil Stern Tube Lubricant is recommended for the lubrication of Cedervall-type stern tube bearings on ships where a high viscosity, readily-emulsifying lubricant is recommended by the manufacturer
- Mobil Stern Tube Lubricant is also recommended for the lubrication of fin tilting bearings, as well as the crux trunnion bearings of Denny-Brown-AEG ship stabilizers and is approved by the manufacturer for use in these applications

Marine Oils Typical Properties

Product Name	Specific Gravity	Pour °C	Flash °C	Viscosity		V.I.	TBN	SAE VG
				cSt at 40°C	cSt at 100°C			
Mobilgard 1 SHC	0.87	-54	250	109	14.5	136	15	40
Mobilgard 570	0.94	-9	256	222	20.0	104	70	50
Mobilgard 450 NC	0.90	-6	260	139	14.1	99	13	40
Mobilgard ADL 40	0.89	-21	239	132	14.7	112	12	40
Mobilgard M330	0.91	-6	244	106	12.0	99	30	30
Mobilgard M430	0.91	-6	250	143	14.0	100	30	40
Mobilgard M440	0.91	-6	242	143	14.0	100	40	40
Mobilgard M50	0.92	-6	228	142	14.5	99	50	40
Mobilgard 312	0.90	-9	266	108	12.0	100	15	30
Mobilgard 412	0.90	-9	272	142	14.5	100	15	40
Mobilgard 300	0.90	-12	266	111	12.0	97	5	30
Mobil Stern Tube Lubricant	0.92	10	246	385	24.0	82	-	-

Other Industrial Oils

Mobil Almo™ 500 Series

Mobil Almo 500 lubricants are premium quality high performance products for pneumatically operated rock drills in underground and surface mining operations. They offer an optimum balance of adhesiveness, yet are emulsifiable enough to pick up moisture carried in the air stream and reduce the negative effects of water on wear and corrosion. They do not form gummy deposits that could cause sluggish valve action. Even in the presence of water, the Mobil Almo 500 oils have good preferential metal-wetting properties that maintain continuous oil films.

Advantages and Potential Benefits:

- Long tool life reduces downtime, enhances feed rate and increases productivity
- Excellent protection against wear of components reduces maintenance costs
- Reduced formation of sludge and deposit for trouble-free operation
- Improved valve operation
- Effective lubrication in the presence of water

Applications:

- Pneumatically operated rock drills in underground and surface mining operations
- Pneumatically operated drills and jack hammers in highway construction and building operations
- Rock drills in quarry operations
- Percussion and rotary air-operated tools in industrial applications

Product Name	ISO Grade
Mobil Almo 527	-
Mobil Almo 530	220
Mobil Almo 532	320

Mobilarma™ 798

Mobilarma 798 contains three premium performance rust preventives that cover a range of applications including storage and inter-operational activities. Mobilarma 798 is intended for the lubrication and rust protection of wire rope in industrial, construction, mining and marine applications. Mobilarma 798 exhibits excellent water displacing properties and forms thin tenacious films that protect surfaces even under severe conditions, including high moisture levels and exposure to acid or corrosive fumes.

Advantages and Potential Benefits:

- Excellent coverage and protection with thin film reduce waste and costs
- Easy application

Applications:

- Lubrication and preservation of strands and running ropes
- Impregnation of steel wire ropes during manufacture

Mobilarma™ 524

Mobilarma 524 is a premium performance product primarily intended as run-in or lay-up lubricants, which provide effective rust preventive films on the internal surfaces of machinery. Mobilarma 524 is particularly suitable as run-in lubricant for diesel and gasoline engines. The oil displaces water from metal surfaces and form strong water-resistant films on the metal surfaces to prevent rust and corrosion. Mobilarma 524 absorb the water in systems into a water-in-oil emulsion so that the contact surfaces of the machinery still get satisfactory lubrication. The high level of chemical stability and the anti-wear and detergent properties make Mobilarma 524 suitable as high quality short-term lubricants.

In most applications, the residual rust preventive films need not be flushed away when the assembly is filled with lubricating oil or hydraulic fluid and put back in service. However, flushing with a charge of lubricating oil to remove the Mobilarma 524 product or its residual film, is recommended if:

1. The Mobilarma 524 does not provide the required lubricant characteristics to operate the equipment at rated loads and temperatures
2. Draining of the equipment is difficult and considerable pockets of the Mobilarma 524 cannot be easily removed
3. Contamination of the system oil by the Mobilarma 524 could reduce the lubrication performance characteristics (examples; Mobilarma could increase Freon cloud points in compressors or water-in-oil emulsions reduce anti-wear characteristics in high pressure hydraulic systems)
4. Presence of the rust preventive agents reduces the ability of the new oil to separate water in turbine and similar equipment

Advantages and Potential Benefits:

Mobilarma 524 provides an excellent lubricant that also acts as a rust preventive. This allows safe lay-up of equipment that will not be used immediately but may be operated intermittently at low to moderate loads for short periods of time. Mobilarma 524 provides excellent rust preventive performance reducing any potential damage that could otherwise occur in non-operating equipment. This saves clean-up and potential rigorous flushing procedures prior to placing the equipment back in service.

- Excellent Rust and Corrosion Protection providing high level protection against rust during seasonal lay-ups, reducing clean-up time required to place equipment back into production, while displacing water from metal surfaces and forming tenacious protective films
- Effective Anti-Wear Properties which protects equipment against wear
- Dual Purpose Lubricant/Rust-Preventive Nature, reducing costs and time for run-in, testing or adjustment procedures and eliminates unnecessary flushing and draining steps

Applications:

- Run-in oil and lay-up oil for engines and industrial equipment
- Turbines that will be out of service for long periods
- Hydraulic systems where water is present and the formation of emulsions will not affect operation
- Test calibration oil

Mobiltherm™ 605

Mobiltherm 605 heat transfer oil is a high performance product for open and 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 allows it to be pumped readily at both start-up and operating temperatures. Mobiltherm 605 is very thermally stable and is capable of an extremely long service life without deposit formation or viscosity increase. It demonstrates specific heat and thermal conductivities that provide more rapid heat dissipation. Mobiltherm 605 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.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity
- Reduced formation of sludge and coke deposits for optimum heat transfer capability
- Reliable flow and lubrication during cold starts, even at low temperatures
- High heat transfer rates and optimum operating efficiency lower operating costs

Applications:

- Bulk oil temperature ranges for Mobiltherm 605: closed systems (-12° C to 315° C), open systems (-12° C to 180° C)
- Closed, cold-oil sealed, indirect heating and cooling systems in all kinds of industrial processes operating at bulk oil temperatures up to the maximum temperatures quoted above and at atmospheric pressure
- Open systems provided the bulk temperatures do not exceed the maximum temperatures quoted above

Mobil Velocite™ Oil Numbered Series

The Mobil Velocite Oil Numbered oils are premium performance products designed for 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 high quality, low viscosity base oils and additives that impart good resistance to oxidation, rust and corrosion. They possess very good resistance to foaming and separate readily from water.

Advantages and Potential Benefits:

- Long service life reduces replacement costs, minimises downtime and increases productivity
- Extended equipment service intervals reduce maintenance costs
- Reduced formation of sludge and deposits for trouble-free operation
- Increased precision
- Easy removal of moisture from system reservoirs

Applications:

- High speed spindle bearings in machine tools and equipment where high speeds and fine clearances are involved
- Precision grinders, lathes, jig borers and tracer mechanisms
- Velocite Oil No 3 is recommended for “zero clearance” type spindle bearings which operate with extremely close clearances
- For sleeve type spindle bearings having greater clearances, the choice of viscosity depends on the relation between clearance and spindle speed
- Low pressure hydraulic systems where appropriate viscosity is selected
- Air line oilers (Mobil Velocite Oil 10)
- For certain sensitive instruments such as telescopes and laboratory equipment

Product Name	ISO VG
Mobil Velocite Oil No. 3	2
Mobil Velocite Oil No. 6	10
Mobil Velocite Oil No. 10	22

Mobilect™ 39 & Mobilect™ 44

Mobilec 39 and Mobilect 44 are high quality mineral insulating oils with very good dielectric properties and oxidation stability intended for transformers, switchgears and other electrical equipment.

Mobilect 39 is uninhibited and meets the specifications IEC 60296 (04) and ASTM D1275B / CIGRE corrosion tests requirements.

Mobilect 44 is inhibited to ensure improved oxidation resistance and meets the specifications ASTM D3487 TYPE II and IEC 60296 – 04 Special Applications.

Advantages and Potential Benefits:

- Mobilect 39 and Mobilect 44 has a high resistance to thermal and chemical degradation in the presence of iron and copper, which reduces tendencies to produce sludge and oil-soluble oxidation products. When lower quality oils are used these may form deposits in the transformer and impede heat transfer by interfering with convection currents. In addition deposits may accelerate insulation defects and are often very difficult to remove without complete dismantling
- Mobilect 39 and Mobilect 44 are specifically treated during manufacture to remove moisture. Water will reduce the electrical insulating properties of the oil and promote oxidation. It is important to remember that a dry oil is hygroscopic and absorbs moisture from the air. It must therefore always be stored in dry conditions and well-closed containers. It is strongly recommended to dry the product before use or use it within short notice after purchasing to avoid long term storage
- The dielectric strength of Mobilect 39 and Mobilect 44 is a measure of the resistance of the oil to electric stress and is expressed in kV across a specified gap under test conditions. This is not a measure of the quality of the oil but of the absence of contaminants - especially moisture, fibres and polar chemicals
- Mobilect 39 and Mobilect 44 are free from wax even at low temperatures and thus circulates freely in outdoor applications. Its viscosity ensures readily heat transfer by mobile convection currents. Mobility is also essential to quick quenching of arcs in switchgear units
- The low pour point of Mobilect 39 and Mobilect 44 ensures a free flow in most conditions between the transformer and the conservator and maintains the reliability of tap changers at the lowest temperatures

Applications:

- Mobilect 39 and Mobilect 44 are recommended for use in oil filled transformers and switchgears in which the oil is required as an insulation medium or as a heat transfer medium
- Mobilect 39 is to be used in applications specifying IEC 60296 (04) General Specifications and reinforced copper corrosion protection (pass ASTM D1275B corrosion test)
- Mobilect 44 is to be used in applications specifying ASTM D3487 TYPE II and IEC 60296 -04 Special Applications
- Mobilect 39 and Mobilect 44 are not suitable for use in oil filled cables, for special impregnation processes or for use in capacitors

Other Industrial Oils Typical Properties

Product Name	Specific Gravity	Pour ˚C	Flash ˚C	Viscosity		V.I.	ISO VG
				cSt at 40˚C	cSt at 100˚C		
Mobil Almo 527	0.90	-30	204	113	11.4	91	-
Mobil Almo 530	0.89	-27	230	220	19.0	98	220
Mobil Almo 532	0.90	-21	232	320	24.9	99	320
Mobilarma 524	0.88	-18	218	88	10.5	95	-
Mobilarma 798	7.36	-	238	-	23.1	-	-
Mobiltherm 605	0.86	-12	230	30	5.4	95	-
Mobil Velocite Oil No.3	0.80	-36	84	2	1.0	-	2
Mobil Velocite Oil No.6	0.84	-15	180	10	2.6	-	10
Mobil Velocite Oil No.10	0.86	-30	212	22	4.0	-	22
Mobilect 39	0.88	-54	148	9.5	-	-	-
Mobilect 44	0.88	-63	146	7.6	-	-	-

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Aviation Products

Mobil Jet™ Oil II

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 -40ºC and 204ºC.

Mobil Jet Oil II is engineered for aircraft gas turbine engines used in commercial and military service requiring MIL-PRF-23699F-STD level performance. It also is recommended for aircraft-type gas turbine engines in industrial or marine service applications.

Advantages and Potential Benefits:

- Excellent thermal and oxidation stability, reduces the formation of carbon, sludge deposits and maintains engine efficiency helping to extend engine life
- Excellent wear and corrosion protection, helps extend gear and bearing life thereby reducing engine maintenance
- Retains viscosity and film strength across wide temperature range, provideing effective lubrication at high operating temperatures
- Chemically stable, reducing evaporation losses and lowers overall oil consumption
- Low pour point, eases start-up in low ambient temperature conditions

Applications:

- Mobil Jet Oil II is recommended for aircraft gas turbine engines of the turbo-jet, turbo-fan, turbo-prop, and turbo-shaft (helicopter) types in commercial and military service
- Mobil Jet Oil II is also recommended for aircraft-type gas turbine engines used in industrial or marine applications
- Mobil Jet Oil II is approved against the Standard Performance (STD) classification of U.S. Military Specification MIL-PRF-23699
- Mobil Jet Oil II is also compatible with other synthetic gas turbine lubricants meeting MIL-PRF-23699
  - However, mixing with other products is not recommended because the blend would result in some loss of the performance characteristics of Mobil Jet Oil II
- Mobil Jet Oil II is compatible with all metals used in gas turbine construction, as well as with F Rubber (Viton A), H Rubber (Buna N), and silicone seal materials

Mobil Jet™ Oil 254

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 superior 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 of currently available, earlier-generation gas turbine lubricants. The effective operating range of the lubricant is between -40°C and 232°C.

Advantages and Potential Benefits:

- Excellent thermal and oxidation stability, reduces the formation of carbon, sludge deposits, maintains engine efficiency and extends engine life
- Reduces bulk oil oxidation by 50%
- Excellent wear and corrosion protection helps extends seal, gear and bearing life thereby reducing engine maintenance
- Viscosity and shear stability across wide temperature range helps provides effective lubrication at high operating temperatures
- Chemically stable at high operating temperatures reducing evaporation losses and lowers oil consumption
- Excellent resistance to foaming maintains film strength under rigorous operating conditions
- Good low temperature fluidity permits start-up and ensures effective lubrication of critical components at temperatures as low as -40 °C

Applications:

Mobil Jet Oil 254 is recommended for aircraft gas turbine engines of the turbo-jet, turbo-fan, turbo-prop and turbo-shaft (helicopter) types used in commercial and military service.

- Mobil Jet Oil 254 is also suitable for aircraft-type gas turbine engines used in industrial or marine applications
- Mobil Jet Oil 254 is approved against the High Thermal Stability (HTS) classification of U.S. Military Specification MIL-PRF-23699
- Mobil Jet Oil 254 is also compatible with other synthetic gas turbine lubricants meeting MIL-PRF-23699
  - However, mixing with other products is not recommended because the blend would result in some loss of the performance characteristics of Mobil Jet Oil 254
- Mobil Jet Oil 254 is completely compatible with all metals used in gas turbine construction, as well as with F Rubber (Viton A), H Rubber (Buna N), and other commonly used seal materials

Aviation Oil Elite™ 20W-50

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.

Aviation Oil Elite is compatible with non-dispersant mineral oils as well as other ashless-dispersant oils that meet the requirements of MIL-L-22851D/SAE J1899. It can also be used in high-time engines that have previously used a straight mineral oil. In this case it is advisable to carry out the oil-screen inspection recommended by the engine manufacturer.

Advantages and Potential Benefits:

Extensive laboratory, engine rig and flight evaluation tests have demonstrated the excellent performance of Aviation Oil Elite 20W-50.

- High level of rust and corrosion protection helps extends the life of critical engine parts
- Excellent wear protection provides long engine life
- High oxidation and thermal stability helps minimize deposits and extends engine life
- Powerful dispersancy, helps keep engine parts, turbocharger bearings, propeller hub and dome, etc. clean of harmful sludge and varnish deposits
- High Viscosity Index, provides easy starting and fast lubrication of critical engine parts under low temperature conditions as well as high lubricant film strength and low wear under high temperature operating conditions
- 20W-50 Multi-grade provides year-round lubricant for most climates
- Compatible with all commercial aviation piston engine oils - both non-dispersant and ashless dispersant type ensures flexibility in use
- Contains the Lycoming anti-wear/anti-scuffing additive which makes it compliant with FAA airworthiness directive AD 80-04-03-R2 par.b.1

Applications:

- Aviation Oil Elite 20W-50 is U.S. Military approved under SAE J1899, which replaced MIL-L-22851D and is listed in the U.S. Military Qualified Products List QPL-1899
- It is approved by and included in the Qualified Products Lists of Teledyne Continental, and Textron Lycoming and it is designed to satisfy the requirements of all opposed piston engine manufacturers
- It provides an alternate means of compliance with FAA AD 80-04-03-R2 par.b.1.

Mobil Aero™ HF

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

Mobil Aero HF is a premium quality fluid that is approved against the most current version of U.S. Military specification MIL-PRF-5606. It is intended primarily for military aircraft, but it is also used as a hydraulic fluid for small private and commercial aircraft, and as a strut fluid in landing gear of large commercial aircraft. It is a NATO Code Number H-515 fluid.

Advantages and Potential Benefits:

Mobil Aero HF Series aviation hydraulic fluids are designed to meet the demanding requirements of commercial and military aircraft applications. These high quality formulations have a long history of excellent performance and provide long, trouble-free service over a wide range of operating conditions.

- High Viscosity Index allows equipment operation over a wide range of temperatures
- Excellent low temperature properties, provides high performance operation in low ambient conditions
- Good chemical and oxidation stability helps resist the formation of acidic constituents, varnishes, and deposits
- Meets “super clean” requirements of U.S. Spec. MIL-PRF-5606 (Aero HF). Ensures reliable performance of pumps, servo-valves and other hydraulic system components

Applications:

- Mobil Aero HF is a premium quality fluid that is approved against the most current version of U.S. Military specification MIL-PRF-5606
- Meets “super-clean” requirements required by modern aircraft hydraulic systems
- Intended primarily for military aircraft, but it is also used as a hydraulic fluid for small private and commercial aircraft
- As a strut fluid in landing gear of large commercial aircraft

Mobil™ AGL - Synthetic Aviation Gear Lubricant

Mobil AGL is a supreme 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 it 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.

Mobil AGL has a low traction coefficient, which derives from the molecular structure of the base stock used. This results in low fluid friction in the load zone of non-conforming surfaces such as gears and rolling contact bearings. Low fluid friction produces lower operating temperatures and improved gear efficiency, which translates into reduced power and allows for more economical equipment design.

Advantages and Potential Benefits:

Superb high temperature thermal/oxidation resistance, helps extend equipment high temperature operating capability, leading to long oil life, helps reduce need and costs for oil change outs.

- High Viscosity Index and absence of wax helps maintain viscosity and film thickness at high temperatures also giving exceptional low temperature performance, including start-up
- Low traction coefficient reduces overall friction and can increase efficiency in sliding mechanisms such as gearing, with potential for reduced power consumption and lower steady-state operating temperatures
- High load carrying capability, helps protect equipment and extend life; helps minimize unexpected downtime and extend service periods

Applications:

- Mobil AGL offers measurably better performance in lubrication of a helicopter transmission than Type I (MIL-PRF-7808) and Type II (MIL-PRF-23699) turbine oils at high and low temperatures as well as wear resistance that is especially beneficial to military and other helicopters operating under unusual stresses

Mobil™ Aviation Grease SHC 100

Mobil Aviation Grease SHC 100 is a supreme 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. Mobil Aviation Grease SHC 100 is the product of choice for aircraft wheel bearing applications.

Advantages and Potential Benefits:

A key factor in the development of Mobil Aviation Grease SHC 100 was the close contact between ExxonMobil product engineers and key OEMs to ensure that the lubricant would provide exceptional performance in aircraft wheel bearings. This work has helped to confirm the results from ExxonMobil laboratory tests showing the exceptional performance of Mobil Aviation Grease SHC 100 including long grease life, enhanced bearing protection and bearing life in aircraft wheels, and wide temperature range of application.

- High viscosity index (VI) base stock with no wax content allows for a wide application temperature ranges, with excellent protection at high temperatures and low torque, easy start-up at low temperatures
- Outstanding high temperature and low temperature performance allows for a thicker fluid film protecting against wear of equipment parts operating at high temperature
- Excellent protection against wear, rust, and corrosion reducing downtime and maintenance costs because of reduced replacement of equipment parts
- Excellent structural stability and oxidation resistance allows for long intervals between re-lubrication and improved bearing life

Applications:

- Recommended for aviation applications which need a lubricant that can perform normal functions, yet go far beyond in terms of high and low temperatures and long-life performance
- An NLGI Grade 2/ISO VG 100 grease having the cold-temperature pumping resistance of most mineral-oil NLGI Grade 0 greases
- Provides outstanding protection at operating temperatures from –54ºC to 177ºC
- Recommended for high speed, heavy load applications such as wheel bearings, as well as for slower speed, high load applications such as landing gear bearings, slides, and joints

Mobil Aviation Grease SHC 100 is approved as a wheel bearing grease by all major aircraft wheel manufacturers

Product Name	NLGI Grade
Mobil Aviation Grease SHC 100	2

Mobilgrease™ 33

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.

Advantages and Potential Benefits:

The lithium complex thickener system provides excellent structural stability and resistance to water wash-out. Polyalphaolefin base oil is used in Mobilgrease 33 because of its exceptional thermal/oxidative resistance potential, low volatility, and superb low-temperature capability, without the potential vulnerability of an ester base oil to degradation from reaction with water. The synthetic polyalphaolefin base oil offers excellent low-temperature mobility/pumpability and very low starting and running torque values. In addition, the state-of-the art additive system in Mobilgrease 33 provides superior rust and wear protection and load-carrying capacity compared to aviation greases that meet the minimum requirements of the MIL-PRF-23827 specification.

- High viscosity index polyalphaolefin basestock offers a very wide operating temperature range - outstanding high and low temperature performance and excellent lubricant film protection at high temperatures
- Exceptional resistance to thermal and oxidative degradation leading to long grease and lubricated part service life
- Excellent protection against wear, corrosion, and rusting offering excellent bearing and component protection
- Extreme-pressure characteristics leading to the prevention of excessive wear, even under shock load
- High resistance to water washout allowing for excellent grease performance in adverse weather and other water-exposure conditions

Applications:

- Mobilgrease 33 is a true multipurpose aviation grease intended for use in highly loaded anti-friction bearings, gears, and actuators as well as instruments, high speed bearings (though not recommended for wheel bearings), and general airframe lubrication, over operating temperatures from –73ºC to 121ºC
- It can be used in all applications for which the aircraft manufacturer specifies U.S. Military Specification MIL-PRF-23827, Type I (Grease, Aircraft and Instrument, Gear and Actuator Screw, Grease thickened with metallic soap), Boeing BMS 3-33B (Grease, Aircraft, General Purpose), and Airbus AIMS09-06-002/SAE AMS3052 (Grease, General Purpose, Airframe, Low Temperature Range, Lithium Thickened)
- Mobilgrease 33 is listed in the Qualified Products List of Airbus, Boeing, and the U.S. Military for these specifications. The NATO Code Number for Mobilgrease 33 is G-354

Product Name	NLGI Grade
Mobilgrease 33	1.5

Mobilgrease™ 28

Mobilgrease 28 is a supreme performance, high temperature, antiwear grease designed to combine the unique features of a polyalphaolefin (PAO) synthetic base fluid with an organo-clay (non-soap) thickener. The clay thickener provides excellent stability at high temperatures and Mobilgrease 28 has a high dropping point value of around 300ºC. The wax-free nature of the synthetic base fluid, together with its low coefficient of traction compared with mineral oils, provide excellent low temperature pumpability, very low starting and running torque, and can reduce operating temperatures in the load zone of rolling element bearings.

In addition, it resists water washing, provides superior load-carrying ability, reduces frictional drag, and prevents excessive wear. Tests show that Mobilgrease 28 prevents friction oxidation (fretting) and lubricates rolling element bearings under conditions of high speeds and temperatures. It has also shown superior ability to lubricate heavily loaded sliding mechanisms, such as wing flap screw jacks. Its consistency is between an NLGI No. 1 and No. 2 grease.

Advantages and Potential Benefits:

A particular need of aviation greases is the need to resist high temperature stresses, while providing excellent starting and low torque at low-temperature. To meet this combination of needs our product formulation scientists chose proprietary synthetic base oils for Mobilgrease 28 because of their exeptional thermal/oxidative resistance potential, and superb low-temperature capability.

Mobilgrease 28 meets the requirements of key military and commercial aviation specifications and has built up a superb reputation for performance and reliability among users around the world.

- High viscosity index base stock with no wax content ensures a very wide operating temperature range - outstanding high and low temperature performance and excellent film protection at high temperatures
- Low traction base oil leads to low sliding friction and reduced heat buildup and the potential for energy savings
- Excellent protection against fretting wear and corrosion providing superb bearing protection and extended bearing life and reduced bearing replacement costs
- Extreme-pressure characteristics, avoid excessive wear, even under shock load
- High thermal/oxidative stability, extends relubrication intervals.
- High resistance to water washout, maintains excellent grease performance in adverse weather and other water-exposure conditions

Applications:

- Mobilgrease 28 is approved against military specifications MIL-PRF-81322G for wide temperature range aviation service and meets the quality level DOD-G-24508A for shipboard service.
- Specific military and civil aviation applications include:
  - Landing wheel assemblies
  - Control systems, screw jacks, servo devices, actuators, sealed-bearing motors and oscillating bearings
  - Helicopter rotor bearings on aircraft and on naval shipboard auxiliary machinery
  - Subject to equipment manufacturers approvals where superseded specifications MIL-G-81322 (WP), MIL-G-7711A, MIL-G-3545B, and MIL-G-25760A may be called for

Product Name	NLGI Grade
Mobilgrease 28	1.5

Aviation Oils Typical Properties

Application Product Name	Specific Gravity	Pour °C	Flash °C	Viscosity		V.I.	ISO VG
				cSt at 40°C	cSt at 100°C		
Mobil Jet Oil II	1.00	-59	270	25.4	5.1	-	-
Mobil Jet Oil 254	1.00	-62	254	26.4	5.3	-	-
Aviation Oil Elite 20W50	0.88	-26	260	182	20.6	133	SAE 20W50
Mobil Aero HF	0.87	-62	107	14	5.2	370	-
Aviation Gear Lubricant	0.86	-48	231	66	10.3	144	68

Application Product Name	Thickener Type	Colour Visual	Worked Penetration	Viscosity cSt at 40°C	NLGI Grade
Mobil Aviation Grease SHC 100	Lithium Complex	Red	280	100	2
Mobilgrease 33	Lithium Complex	Blue - Green	292	12.5	1.5
Mobilgrease 28	Clay	Dark Red	293	30	1.5

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Appendix

ISO Viscosity Chart

Industrial oils are graded in accordance with the ISO Viscosity Classification system, approved by the International Standards Organisation (ISO). The ISO system is based on viscosity at 40°C. ISO viscosity ranges are summarised in the table below:

ISO Viscosity Grades	Mid-Point cSt @ 40˚C	Viscosity	
		Minimum	Minimum
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

AGMA Specification for Industrial Enclosed Gear Drives

AGMA Lubricant NO		Viscosity Range cSt @ 40		Equivalent ISO Viscosity*	AGMA Lubricant No
R&O Gear Oils	EP Gear Lubricants	Minimum	Maximum	Grade	Synthetic Gear Oils
0	-	28.5	35.2	32	0S
1	-	41.4	50.6	46	1S
2	2 EP	61.2	74.8	68	2S
3	3 EP	90	110	100	3S
4	4 EP	135	165	150	4S
5	5 EP	198	242	220	5S
6	6 EP	288	352	320	6S
7,7 Comp	7 EP	414	506	460	7S
8,8 Comp	8 EP	612	748	680	8S
8A Comp	8A EP	900	1100	1000	-
9	9 EP	1350	1650	1500	9S
10	10 EP	2880	3520	-	10S
11	11 EP	4140	5060	-	11S
12	12 EP	6120	7480	-	12S
13	13 EP	2880	35200	-	13S
cSt @ 100°C					
14R	-	-	428-857	-	-
15R	-	-	857-35200	-	-

Viscosity ranges for AGMA lubricant numbers are those of ASTM System D 2422.
*For reference only – not included in AGMA specifcations. Viscosity system for Industrial Fluid Lubricants ASTM D2422. Also British Standards Institute B.S. 4231.

NLGI Grease Consistency Classification System

NLGI Grade Number	ASTM Worked Penetration @ 25˚C
000	445-475
00	400-430
0	355-385
1	310-340
2	265-295
3	220-250
4	175-205
5	130-160
6	85-115

Grease Compatibility Chart

C = Compatible M = Moderate Compatible I = Incompatible	Aluminum Complex	Calcium Complex	Calcium Sulphonate	Lithium 12-Hydroxy	Lithium Complex	Polyurea (shear stable)	Clay
Aluminum Complex	C	I	M	I	I	M	I
Calcium Complex	I	C	I	I	C	C	I
Calcium Sulphonate	M	I	C	M	C	I	I
Lithium 12-Hydroxy	I	I	M	C	C	C	I
Lithium Complex	I	C	C	C	C	C	I
Polyurea (shear stable)	M	C	I	C	C	C	M
Clay	I	I	I	I	I	M	C

Note: This matrix is based on information commonly used in industry. It provides a general assessment of grease compatibility based upon the structural stability of mixtures of different grease thickeners. It does not address potential additive related incompatibilities or other performance features. Classification may differ for specific greases depending on composition and manufacturing process. It is always recommended to thoroughly remove and clean out any old grease remaining in application prior to converting to a different grease.

Information in this table does not engage the responsibility of ExxonMobil or its affiliated companies.

Additives for Premium Lubricating Oils

Many chemical additive agents are used in the formulation of high-quality oils. They are either single purpose materials or multi-purpose materials. Listed below are descriptions of some commonly used additive types:

Adhesive Agent is made of tacky, stringy materials to form and retain uniform films on metal surfaces.

Anti-wear Agent is made of materials that are absorbed or concentrated on metal surfaces to form films which minimise direct metal-to-metal contact. The name applies to materials, which enhance the anti-wear characteristics of petroleum oils, allowing double or even triple loads handled by conventional petroleum.

Defoamant promotes rapid breakup of foam bubbles by weakening the surface tension of the bubbles, when added to fluids.

Demulsifier separates oil rapidly from water to prevent rust.

Detergent is any neutral-to-over-based (high alkalinity), metallic agent that carries extra neutralisation and cleanliness power. When added to oils, detergents can reduce the level of acidic materials generated when burning high sulphur fuel to keep engines clean.

Dispersant suspends organic deterioration in the lubricant to minimise formation of harmful deposits.

Extreme Pressure Agent is made of materials that are more active than anti-wear agents. They react with metal surfaces to form relatively oil insoluble surface fills to reduce friction, control wear and prevent surface damage. Such materials are used, for example, in the Mobilgear 600 XP Series oils. Automotive hypoid gears require lubricants, which contain very active extreme pressure agents.

Friction Modifier is a general category of materials that are used to alter the frictional characteristics of a lubricant. They may be used to increase friction that may be important to improving fuel economy or energy conservation. They may also be used to reduce stick-slip or chatter in wet clutch applications.

Oxidation Inhibitor is made of peroxide decomposers to convert peroxides into harmless compounds.

Chain Stoppers interrupt the chain reaction between oxygen and hydrocarbon radicals to prevent or slow the formation of acidic materials, propagated materials, and sludge.

Metal Deactivators retard the oxidation-promoting catalytic effect of metals in a lubricating system. The metal surfaces or particles are covered by the agent which acts as a barrier to prevent the catalytic effect. The most catalytically active metal is copper; the second is lead, and the third is iron.

Some additive agents function as chain stoppers, peroxide decomposers, and/or metal deactivators.

Pour Point Depressant improves the low-temperature fluidity of mineral oils and reduces wax formation at low temperatures.

Rust Inhibitor enhances the lubricant's ability to minimise rusting. The primary guide to rust inhibitor is the ASTM D 665 Rust Test, a pass or fail test.

Viscosity Index Improver is made of high-molecular-weight polymers to improve the viscosity index of oils by coiling and uncoiling in response to temperature. They do not affect the pour point at low temperatures and provide sufficient viscosity at high temperatures.

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°C and typically reported in Centistokes (cSt).

WEAR METALS

The presence of these metals can indicate wear on a microscopic level before it can be detected by conventional means. The existence of wear 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	Source
Iron	Cylinders, Gears, Rings, Crankshafts, Liners, Bearings, Rust
Chromium	Rings, Bearing and Liner Plating
Lead	Bearing Overlays
Copper	Hydraulic Pumps, Bearing Cages, Bushings, Bronze Components
Tin	Bearing Plating, Compressors
Aluminium	Pistons, Bearing and Pump, Blower and Compressor Impellers
Nickel	Valves
Silver	Bearing and Bushing Plating
Manganese	Trace Element in Gas Turbine Components

CONTAMINANTS

These elements can indicate contamination. The combination of contaminant and metals can create harmful operating conditions in your machine.

Contaminant	Source
Silicon	Abrasive Dirt, Sealant, Defoamant
Boron	Anti-freeze, Oil Additive
Sodium	Anti-freeze, Oil Additive
Potassium	Anti-freeze, Oil Additive
Acid	Oil Degradation (TAN)
Oxidation	Thermal Degradation of Oil
Water	Anti-freeze, Process Water, Condensation
Glycol	Anti-freeze
Fuel	Fuel System
Soot	Incomplete Combustion, Blow-by
Chlorine	Land Fill Gas, Sea Water
Silver	Bearing and Bushing Plating
Manganese	Trace Element in Gas Turbine Components

ADDITIVES

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

Additive	Functions
Magnesium	Dispersant/Detergent (TBN)
Calcium	Dispersant/Detergent (TBN)
Barium	Dispersant/Detergent
Phosphorus	Anti-wear