A GUIDE TO PRODUCTS AND SERVICES

FIELD TESTED. FLEET TRUSTED.™

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1. Engine Oils

Synthetic Engine Oils

Castrol® Elixion™
SAE 5W-30
Castrol Elixion is a full synthetic diesel engine oil engineered to reduce operating costs while providing outstanding engine protection and up to 4% fuel economy.* Castrol Elixion offers certified API CJ-4 performance, and its highly advanced chemistry provides extra protection against cold starts, wear, soot, oxidation and deposits. Industry Specifications and OEM Approvals: API CJ-4, CI-4 Plus, CI-4, CH-4; Detroit Fluid Specification 93K218; CAT ECF-3; Cummins CES 20081; Volvo VDS-4; MACK EO-O Premium Plus; and MB Sheet 228.31.
*compared to conventional 15W-40

Semi-Synthetic Engine Oils

Castrol® Hypuron™ Advanced Formula
SAE 10W-30
Castrol Hypuron Advanced Formula offers “extreme” extended drain intervals up to 70,000 miles or 900 hours* while offering equivalent or better engine wear protection versus 15W-40 oils. Castrol Hypuron Advanced Formula maintains a strong TBN level and up to 1% fuel economy compared to 15W-40, and semi-synthetic base oils offer substantial advantages over traditional mineral base oils, including improved deposit control, wear protection and volatility, better soot management, low temperature performance and oxidation control. Industry Specifications and OEM Approvals: API CJ-4; API SN; Cummins CES 20081; Volvo VDS-4; Mack EO-O Premium Plus; Detroit Fluid Specification 93K218; CAT ECF-3; and JASO DH-2.
*in combination with a proper oil analysis program

Castrol® Hypuron™
SAE 15W-40
Castrol Hypuron is a semi synthetic heavy duty diesel engine oil. It has saved fleets thousands of dollars in maintenance and repair costs while maximizing uptime by safely extending drains up to 2 times or 50,000 miles without compromising engine protection. Designed to provide excellent wear protection, soot management, oxidation control and high shear stability, Castrol Hypuron can also be used in older vehicles. Industry Specifications and OEM Approvals: API CJ-4, CI-4 Plus, CI-4, CH-4, SM; Cummins CES 20081; Caterpillar ECF-3, ECF-2, ECF-1-a; Mack EO-O Premium Plus; Volvo VDS-4; Detroit Fluids Specifications 93K218; and Hino.

Conventional Engine Oils

Castrol® Tection® Extra
SAE 15W-40
Castrol Tection Extra is a heavy duty diesel engine oil designed to provide superior performance and protection. Tection Extra’s formulation exceeds API CJ-4 specifications, translating to better soot management, improved wear protection and better oxidation control. Castrol Tection Extra provides viscosity-controlling technology to protect against wear even under severe operating conditions, and is capable of extending drain intervals.* Industry Specifications and OEM Approvals: API CJ-4, CI-4 PLUS, CI-4, CH-4, CG-4, CF, SM; Caterpillar ECF-3, ECF-2, CF-1-a; Cummins CES 20081; Mack EO-O Premium Plus; Volvo VDS-4; and Detroit Fluid Specification 93K218.
*in combination with a proper oil analysis program
**Castrol® Tection HD**

SAE 10W-30

Castrol Tection HD is a diesel engine oil designed to provide excellent performance and protection for pre-2004 US trucks, buses and equipment, including both EGR and non-EGR engines. Formulated with low ash chemistry, Castrol Tection HD offers advanced soot handling and dispersancy, outstanding TBN retention, and good shear stability to protect against wear throughout the oil drain interval. *Industry Specifications and OEM Approvals*: API CI-4, CH-4, CG-4, SJ; Cummins CES 20076; and Mack EO-M Plus.

**Castrol® Assuron™ (Straight Grades)**

SAE 10W 30 40 50

Castrol Assuron Straight Grades are high performance, heavy duty engine oils that couple selected base stocks with a carefully balanced additive package. Castrol Assuron's proven performance in various on- and off-highway heavy-duty diesel engines features enhanced engine performance, protection of engine parts for extended life, and reduced maintenance costs. *Industry Specifications and OEM Approvals*: SAE 10W (CF); 30 (CF-2, CF); 40 (CF-2, CF); 50 (CF-2, CF).

**Castrol® Railroad Engine Oil**

SAE 40

Castrol Railroad Engine Oil is a premium quality, high ash zinc free additive railroad diesel engine oil. It is formulated with highly refined HVI base stocks to meet the severe service demands of today's locomotive engines, where modified piston rings and cylinder liners have significantly reduced oil consumption and placed extra demands on the oil. Castrol Railroad Engine Oil has excellent alkalinity retention. *Industry Specifications and OEM Approvals*: LMOA Generation V; General Electric Generation IV, Long Life; Internal Listing of the Electro-Motive Diesel (EMD) of General Motors.

**On Road Natural Gas Engine Oils**

**Castrol® Duratec™ ES**

SAE 15W-40

Castrol Duratec ES is a low ash synthetic lubricant for use in natural gas fueled engines where minimal thermal degradation and good deposit control is expected, and enables “extreme” extended drain intervals up to 1200 hours.* Castrol Duratec ES delivers exceptional nitration and oxidation control along with antiwear and extreme pressure protection, and reduces deposits and maintains engine cleanliness while offering a wide range of operating temperatures. It is designed for use in a wide range of natural gas equipment, including Cummins, CES 20074, Mack, Volvo, and other on road engines requiring a low ash natural gas engine oil.

**Castrol® Duratec™ NG**

SAE 15W-40

Castrol Duratec NG is a low ash natural gas engine oil that has been proven to safely extend drain intervals up to 600 hours.* It is formulated to provide outstanding resistance to nitration and oxidation, thus meeting the performance requirements of many of today's mobile natural gas fueled engines. Castrol Duratec NG prevents the sludge, varnish, plugged filters, and deposits that occur in natural gas engines as a result of oxidation and nitration, and is designed for use in a wide range of natural gas equipment, including Cummins, CES 20074, Mack, Volvo, and other on road engines requiring a low ash natural gas engine oil.

*in combination with a proper oil analysis program*
Stationary Natural Gas Engine Oils

**Castrol® Duratec LFG**

SAE 40

Castrol Duratec LFG low ash formula was designed to eliminate landfill gas engine operators’ traditional trade-off between high ash oils for longer drain intervals and low ash oils with lower deposits. By increasing drain intervals up to two times versus standard landfill gas engine oils while extending head life up to 70%,* Castrol Duratec LFG combines an exclusive low ash additive package with hydrocracked base stocks that safely extend drain intervals and offer protection against acid formation, oxidation, and nitration. This proprietary low ash technology provides extended oil drains and decreased oil consumption while protecting valves from harmful silicon deposits in stationary natural gas engines.

*in combination with a proper oil analysis program

**Castrol® Duratec HPL**

SAE 40

Castrol Duratec HPL for stationary engines is a low ash formulation designed for modern high-speed, 4-stroke natural gas engines. When compared to standard group I natural gas engine oils, Castrol Duratec HPL reduces daily oil consumption up to 50%, leading to cleaner engines and less carbon build-up. Its excellent TBN efficiency neutralizes harmful acids while the outstanding antioxidants and “antioxidants” suppress oxidation and nitration to prevent sludging, varnishing, plugged filters, deposits, and prematurely thickened oil. Castrol Duratec HPL is designed for use in a wide range of stationery equipment including Caterpillar, Waukesha, Ulstein, Jenbacher, Deutz, Wartsila, Superior, MAN, and Cooper-Bessemer.

**Castrol® Duratec A**

SAE 40 15W-40

Castrol Duratec A ashless formulation is designed to reduce deposit formation and improve oxidation characteristics while offering excellent corrosion control. Outstanding TBN retention technology neutralizes acids throughout the drain interval cycle, protecting engines from acid formation, and stable formulations deliver low oil consumption that leads to less carbon build up and keeps engines running clean with excellent thermal control. Castrol Duratec is catalyst compatible and delivers excellent demulsability to release entrained air and water. It is designed for use in 2-stroke and select 4-stroke equipment including Cooper-Bessemer, Clark, Worthington (2T) and AJAX.

**Castrol® Duratec M**

SAE 15W-40

Castrol Duratec M medium ash formula delivers an advanced detergent/dispersant system that has been designed to reduce deposit formation and improve oxidation characteristics while offering excellent corrosion control and TBN retention. Its higher ash content also overcomes valve seat recession problems. Duratec M offers exceptional anti-wear and extreme pressure protection, and reduces deposits to maintain engine cleanliness.

**Castrol® Duratec L**

SAE 40 15W-40

Castrol Duratec L has been designed to reduce deposit formation and improve oxidation characteristics while offering excellent corrosion control and TBN retention. Duratec L provides outstanding resistance to acid corrosion and is specially formulated to reduce valve seat recession. With a wide range of operating temperatures, Duratec L offers exceptional anti-wear and extreme pressure protection, reduces deposits and maintains engine cleanliness. Castrol Duratec L is designed for use in a wide range of equipment including modern 4-stroke engines, Caterpillar, Waukesha, Ulstein, Jenbacher, Deutz, Wartsila, Superior, and Cooper-Bessemer.
2. Hydraulic Fluids

Castrol® Dual Range HV
ISO 32 46 68 100
Castrol Dual Range HV Hydraulic Fluids are exceptional multi-viscosity hydraulic fluids designed for the most severe environments and applications in construction and mining machinery under varying ambient conditions. Shear stable polymers keep the fluid's viscosity consistent over a wide range of temperatures. Castrol Dual Range HV Hydraulic Fluids offer energy efficiency along with high viscosity indexes and low pour points to ensure extra pump protection and efficiency in cold weather starts, as well as needed viscosity protection at higher operating temperatures. Castrol Dual Range HV delivers excellent demulsibility and hydrolytic stability, preventing components from damaging rust and corrosion. They are dyed purple to facilitate leak detection. Industry Specifications and OEM Approvals: Denison HF-O, HF-1, HF-2; Vickers 35VQ25A, M-2950-S Mobile Hydraulic Systems and I-286-S Industrial Hydraulic Systems; Cincinnati Machine P-68 (ISO 32), P-70 (ISO 46) and P-69 (ISO 68); Racine S106; Joy Mining Machinery HO-T (AW 46), HO-S (AW 68); DIN 51524.

Castrol® Blue Hydraulic Plus
ISO 32 46 68 100
Castrol Blue Hydraulic Plus meets the most severe industry requirements. It's formulated with up to 50% more performance additive than some competitors, giving a larger margin of safety in key areas of corrosion, oxidation and wear protection. Castrol Blue Hydraulic Plus offers excellent hydrolytic stability in the presence of water, and is formulated to meet or exceed the industry standards for vane, gear and piston pumps. It is well suited for use in mobile hydraulic equipment like excavators, bulldozers and drilling equipment that have various types of pumps and a common sump in the same hydraulic circuit. Industry Specifications and OEM Approvals: Denison HF-O, HF-1, HF-2; Vickers 35VQ25A, M-2950-S Mobile Hydraulic Systems and I-286-S Industrial Hydraulic Systems; Cincinnati Machine P-68 (ISO 32), P-70 (ISO 46) and P-69 (ISO 68); Racine S106; Joy Mining Machinery HO-T (AW 46), HO-S (AW 68); DIN 51524.

Castrol® Paradene AW™
ISO 22 32 46 68 100 150 220 320 460
Castrol Paradene AW is a premium industrial antiwear hydraulic oil line for hydraulically activated equipment that utilizes high-performance pumps. Castrol Paradene AW will remain stable and clean in today's machine tool equipment where increasingly sophisticated control systems are used. Its careful selection of base stock combined with an outstanding additive package including an anti-foam ingredient leads to long fluid life and equipment life savings. Paradene AW provides outstanding long-term performance and protection. Industry Specifications and OEM Approvals: Denison HF-O, HF-1, HF-2; Vickers 35VQ25A, M-2950-S Mobile Hydraulic Systems and I-286-S Industrial Hydraulic Systems; Cincinnati Machine P-68 (ISO 32), P-70 (ISO 46) and P-69 (ISO 68); Racine S106; Joy Mining Machinery HO-T (AW 46), HO-S (AW 68); DIN 51524.

Castrol® Anvol SWX FM™
ISO 46 68
Castrol Anvol SWX FM is an HFDU polyolester-type hydraulic fluid as defined by ISO 6743/4 and ISO 12922. It meets the requirements for Factory Mutual Category 1 Classification and provides a safe working environment and improved system reliability, and is readily biodegradable. Formulated to work in high-pressure hydraulic systems up to 7500 psi, Castrol Anvol SWX FM provides gear, vane and piston pumps with protection against wear equivalent to that of mineral oils. Castrol Anvol SWX FM is used in areas of the manufacturing industry where there is high risk of fire, such as hot strip mills, coil handling facilities, pipe mills and continuous casters.

Castrol® Carelube HTG™ – Biodegradable Hydraulic Oil
ISO 32
Castrol Carelube HTG is formulated from natural vegetable oils to be more environmentally acceptable than traditional hydraulic oils. It is readily biodegradable and is invaluable where leakage could cause soil or water contamination. Castrol Carelube HTG features a naturally high viscosity index base oil (200 VI); this extra-high VI means that Castrol Carelube HTG experiences little change in viscosity during its recommended operating range of 0°F to 175°F. Castrol Carelube HTG has demonstrated low toxicity, naturally high lubricity and anti-wear properties and delivers exceptional stay-in-grade performance over its operating range.
Hydraulic Fluids (cont’d)

**Castrol® Aerial Lift Fluid**
Castrol Aerial Lift Fluid is a specially formulated multi-viscosity hydraulic fluid. It displays noted performance in mobile lift applications where extremes of temperature are encountered and system operation, reliability, dielectric strength and protection are mandatory. Castrol Aerial Lift fluid has outstanding thermal, hydrolytic and oxidation stability.

**Castrol® Paradene R&O™**
ISO 46 68 100 150 220 320 460
Castrol Paradene R&O is a premium quality rust and oxidation inhibited lubricant with excellent water separation ability for longer equipment life and reduced maintenance costs. Castrol Paradene R&O oils are particularly suited to meet today’s stringent industrial requirements through a combination of a high viscosity index base oil, foam, rust and corrosion inhibitors and a special oxidation inhibitor. Castrol Paradene R&O is tailored to meet the needs of non anti-wear hydraulic and circulating systems, as well as non-EP gear oil applications.

**Castrol® SHL™**
Castrol SHL synthetic hydrocarbon lubricants are formulated from select Polyalphaolefins (PAOs), which provide better lubrication at high temperatures and longer equipment life. Castrol SHL contains special anti-wear, anti-oxidant and anti-corrosion additives with a high viscosity index and excellent lubrication properties for power savings and cooler operating temperatures. With exceptional demulsibility and anti-foam properties, SHL lubricants are especially applicable for bearings and gears that operate over a wide range of temperatures, particularly where high temperatures can result in oil life reduction, sludge and frequent clean outs.

3. Transmission Fluids

**Off Road Transmission Fluids**

**Castrol® Trans-C HT**
SAE 10W-30
Castrol Trans-C HT is a full synthetic, all-weather hydraulic and transmission fluid that balances high-temperature wear protection for gears and bearings with low temperature flow properties for positive shifting in transmissions. Its full synthetic formulation can extend drain capability with regular used oil intervals, reduce wear, and guard against foaming. This multi functioning fluid allows for product consolidation. Castrol Trans-C HT is recommended for use as a TO-4, TO-4M or C4 type fluid and offers excellent Vickers 35VQ25 performance.

**Castrol® Trans-C**
SAE 10W 30 50 60*
Castrol Trans-C is formulated to meet the strict frictional requirements of a Caterpillar TO-4 fluid, and is tested for friction control using seven different frictional materials, both metallic and nonmetallic. Castrol Trans-C’s proven friction control results in powershift transmission performance with less clutch slippage and clutch setting adjustments and elimination of brake noise. Anti-foam protection and excellent sludge and deposit control ensures clear lubrication channels resulting in a longer, trouble-free transmission life. *Approvals and Recommendations:* Castrol Trans-C provides Allison C-4 and Vickers 35VQ25 performance and exceeds TO-4 specifications.

*Available in drums only.
Castrol® UTF™ – Universal Tractor Fluid

Castrol UTF is a premium hydraulic/transmission fluid that exceeds the refill and service top-off needs of farm and industrial tractor transmissions, differentials and wet disc brakes. Castrol UTF is compounded with anti-wear, extreme pressure, anti-oxidant and friction control additives and foam and corrosion inhibitors, and couples this superb additive package with highly refined base oils and a shear stable viscosity index improver for a balanced package. Castrol UTF provides just the right balance of smooth engagement and minimum slippage, which is ideal for power transmission performance. Due to its smooth performance characteristics, Castrol UTF reduces heat-associated wear in power transmissions.

**OEM Specifications:** Allis Chalmers Power Fluid 821; Case/New Holland MS-1207/Hy- Tran Plus, MS-1204/TFD Fluid, MS-1205/TFD-II Fluid, MS-1206/PFT Fluid, JIC-145, JIC-185, B-6/Hy-Tran, CNH MAT 3505 (MS-1209 Hy-Tran Ultra Fluid), Ambra Mastertrans Fluid CNH MAT 3525 (M2C-134D), Multi G & Multi G 134, Nexplore Fluid; Caterpillar TO-2; John Deere J20A, J20C, JD303, J14B, J14C; Deutz-Allis AC Power Fluid 821 XL; Ford Tractor M2C53A, M2C53C, M2C21A/B, M2C21B/C, M2C134A/B/C/D, M2C77A; Kubota Universal Transdraulic Fluid, UDT Fluid; Massey Ferguson M-1110, M-1127 A/B, M-1129-A, M-1135, M-1141 (Permatran III); Oliver/White Q-1766B, UHTF Type 55, Q-1722, 102082, Q-1826; Sperry Vickers Pass on Pump Tests ASTM-D2882 and 35VQ25; Volvo WB-101; ZF - D3E, D5F.

Castrol® Transynd RD

Castrol Transynd RD is a premium, synthetic, universal powershift and automatic transmission fluid that is engineered to remain stable under the most severe conditions. With excellent thermal and oxidation stability that resists deposit formation, Transynd RD is a year-round fluid that offers outstanding corrosion and foaming resistance and high viscosity index synthetic base fluids that provide superior high/low temperature performance. Castrol Transynd RD is recommended by Allison Transmission for “Rigorous Duty” applications where extended drain intervals and reduced life cycle costs are desired in Allison 5000, 6000, 8000 and 9,000 Off-Highway Series transmissions. **Industry Specifications and OEM Approvals:** Allison TES 353 (AN-032001), Allison C4 (31554001)

**On Road Transmission Fluids**

**BP Autran Syn 295**

BP Autran Syn 295 is a fully synthetic, shear stable fluid that provides wear protection for the transmission throughout the drain interval. Formulated with high viscosity index, fully synthetic base fluids, BP Autran Syn 295 is able to stay in grade, even during severe operating conditions, thus allowing fleet managers to safely extend drain and filter change intervals without compromising equipment performance. Over time, increased service intervals can save a fleet valuable time and money in the cost of maintenance, labor, oil and parts. **Industry Specifications and OEM Approvals:** Allison TES-295 (AN-031002), Allison C-4 (33014203), DEXRON.e-111 (G-34746), Voith Transmission, ZF Transmissions.

**Castrol® Syntrans Z Long Life**

**SAE 75W-80**

Castrol Syntrans Z Long Life is a full synthetic fluid developed specifically to meet ZF extended drain intervals requirements (500,000 km) and is particularly suitable for severe applications where loads and temperatures are higher. It is approved for use in all ZF commercial manual and automated manual transmissions, and can be recommended in other manual transmissions requiring API GL-4. With excellent wear and EP performance, Syntrans Z Long Life’s outstanding frictional characteristics provide improved shift quality and extend component life, thus reducing maintenance costs. **Industry Specifications and OEM Approvals:** API GL-4 MAN 341 Z5, MB-Approval 235.41, ZF TE-ML 01E, 02E, 16P.

**Castrol® Syngear™ CD 50**

**SAE 50**

Castrol Syngear CD 50 is a specially formulated synthetic transmission fluid designed for extended drain and severe service in heavy-duty manual transmissions that require a non EP gear or transmission fluid. Castrol Syngear CD 50 contains an anti-wear additive as well as rust, oxidation and corrosion inhibitors, and its 100% synthetic base stocks provide greater load carrying ability and excellent thermal stability for greater fuel economy and longer equipment life. Castrol Syngear CD 50’s high viscosity index and low pour point provide outstanding all-weather, year round performance. **Industry Specifications and OEM Approvals:** Eaton Roadranger PS164REV7, Meritor extended drain, Dana synchronized and non-synchronized transmissions.
Transmission Fluids (cont’d)

Castrol® Syntrans
SAE 75W-85
Castrol Syntrans is a full synthetic transmission fluid recommended for most commercial vehicle manual transmissions (truck, bus, light commercial vehicle) where API GL-4 lubricants are required. Excellent thermal and oxidative stability maintains transmission cleanliness and lubricant performance, allowing extended drain capability. Superb cold flow characteristics give smoother gear shifts at low temperatures, and high shear stability maintains lubricant performance throughout the drain interval. Castrol Syntrans’ good wear and EP performance also ensures component protection under high load conditions, reducing downtime and service costs. *Industry Specifications and OEM Approvals: API GL4, MAN 341 E4, MB approval 235.

Castrol® Heavy Duty Multi-Purpose ATF
Castrol Heavy Duty Multi-Purpose Automatic Transmission Fluid (ATF) is suitable for most power transmission and hydraulic systems, including passenger car and truck automatic transmissions, powershift transmissions in off-highway construction equipment, hydrostatic drives and industrial, agricultural, mining and marine hydraulics. Castrol Heavy Duty Multi-Purpose ATF has excellent anti-wear, corrosion resistance, friction retention, and oxidation and thermal stability. *Industry Specifications and OEM Approvals: Allison TES-389 and Allison C-4 (older equipment that recommends a non-synthetic “Dexron type”), hydraulic/compressor applications for Vickers (35VQ25, V-401C) and Denison (T-6C, P-46).

4. Gear Lubricants

Mobile Equipment Gear Oils

Castrol® Syngear™
SAE 75W-90 80W-140
Castrol Syngear is a premium, synthetic, heavy duty, multi-grade gear lubricant that meets API GL-5 service. It provides excellent cold weather performance, outstanding stability under higher than normal operating temperatures, and substantial load carrying ability for cooler operation and longer equipment life. Castrol Syngear is ideal for severe service environments and customers who want to extend service intervals. *Industry Specifications and OEM Approvals: API GS-5, API MT-1 (75W-90); SAE J2360 (Formerly MIL-PRF-2105E); Dana SHAES 429 Rev. A, Dana SHAES 256 Rev. C (75W-90); Mack Truck GO-J Plus (75W-90); and International TMS 6816. Accepted by Eaton Corporation as alternatives to their Eaton Roadranger Lubricants.

Castrol® Axle FD-1
Castrol Axle FD-1 is semi synthetic, multi grade final drive fluid designed to extend drain intervals up to 6000 hours* in off road final drives where FD-1 specified fluids are suitable for use. Castrol Axle FD-1 improves wear protection when compared to mineral TO-4 50 fluids; additionally, Castrol Axle FD-1’s synthetic base stock withstands a wide range of operating temperatures. *in combination with a proper oil analysis program

Castrol® AP Gear Lubricant™
SAE 80W-90 85W-140
Castrol AP (All Purpose) Gear Lubricant is a multi-purpose, thermally stable, extreme pressure gear oil formulated to extend oil service life and reduce critical component wear. Its high-quality base oils and additives provide excellent load-carrying ability, EP properties, wear resistance, oxidation stability and anti-rust, anti-corrosion and anti-foam properties. Castrol AP Gear Lubricant meets the requirements of API (American Petroleum Institute) gear oil classification GL-5 and SAE J2360 (Formerly MIL-PRF-2105E). *Recommendations: Castrol AP Gear Lubricant is recommended for a variety of applications, including but not limited to BMW, Dodge, Eaton, Ford Motor Company, General Motors and Rockwell International. Castrol AP Gear Lubricant is J2360 (Formerly MIL-PRF-2105E) approved.
Stationary Gear Oils

**Castrol® Isolube™**

ISO  150  220  320  460

Castrol Isolube is a synthetic lubricant with technically advanced chemistry that excels in applications requiring optimum oxidation control and thermal stability, consistent anti-wear performance and low carbon-forming tendencies. Castrol Isolube extends drain intervals and provides excellent performance in circulating oil and gear set applications and in compressors. Castrol Isolube can reduce power consumption versus some competitive conventional and synthetic gear oils, delivering a 6.2% improvement vs. a non-EP conventional gear oil.* Its improved molecular structure and a minimal decrease in operating viscosity leads to lower internal friction, which results in a decrease in power consumption.

*Energy consumption was measured in kilowatts used per ton of rock conveyed. Ambient and operating temperatures were evaluated in order to quantify additional benefits derived from all products.

**Castrol® Isolube EP™**


ISO  68  100  150  220  320  460  680

Castrol Isolube EP lubricants are a series of ISO graded chemistries with carefully chosen synthetic components to deliver optimum performance in applications requiring AGMA EP gear oils. Castrol Isolube EP provides maximum protection in industrial gear sets, off-highway construction and mining applications. It has exceptional oxidative and thermal stability.

**Castrol® EP Gear Lubricant**


ISO  68  100  150  220  320  460  680

Castrol EP Gear Lubricants are exceptional quality gear oils designed for severe duty applications. They feature selected base oils with an extremely stable additive package, delivering outstanding performance where an AGMA EP gear oil or U.S. Steel 224 performance is recommended.

**Castrol® Worm Gear Lubricant**

AGMA  7 Comp

ISO  460

Castrol Worm Gear Lubricant represents current technology for the lubrication of industrial worm gear drive, and where high starting loads are experienced. It is compounded to provide extra lubricity and friction modification under heavy loads and temperatures.
5. Greases

Castrol® Pyroplex™ Gold
NLGI  1   2
Castrol Pyroplex Gold is a high performance, semi synthetic, aluminum complex grease that excels in heavily-loaded equipment where extreme operating conditions prevail. It contains a high level of synthetic solids, including 6% molybdenum disulfide, and enhanced Hydro-Activated™ technology coupled with an aluminum complex thickener and carefully selected semi-synthetic base fluids to give equipment a protective lubricant barrier against wear, even during conditions of high load. Castrol Pyroplex Gold combines the mobility of a typical NLGI 1 grade grease with the staying power and extreme pressure performance of an NLGI grade 3 grease.

Castrol® Pyroplex™ Protection ES
NLGI  1   2
Castrol Pyroplex Protection ES is a specially formulated synthetic, lithium complex grease designed for extended service performance in challenging on-highway applications. It provides corrosion resistance, extreme pressure performance, enhanced hydroactivation technology for performance in wet conditions and “stay-in-place” ability with outstanding mobility through all seasons.

Castrol® Pyroplex™ Blue
NLGI  1   2
Castrol Pyroplex Blue's unique multifunctional solid lubricant additive actually builds tack and adhesion when exposed to moisture via Hydro-Activated™ technology that resists softening and washout. Castrol Pyroplex Blue protects plain and anti-friction bearings under severe conditions where water, dust and pressure are present. It is designed to operate in wet environments over a wide temperature range. Ideal for hinge and bucket pins, Castrol Pyroplex Blue's affinity for metal surfaces is enhanced, and lubricating film strength increases where high temperature performance, rust protection and extreme pressure properties are required.

Castrol® Pyroplex™ Red
NLGI  1   2
Castrol Pyroplex Red is a multi-purpose grease designed to operate over a wide temperature range. Its lithium complex base plus extreme pressure additives exhibit good water resistance and mechanical stability in high temperature applications. Castrol Pyroplex Red is a high temperature, EP, lithium complex grease that meets the highest performance standards of automotive, fleet, industrial and off-highway applications. Its ability to withstand extreme high temperatures makes it a particularly good grease for use with disc brake wheel bearings. Castrol Pyroplex Red exceeds NLGI specification GC-LB.

Castrol® Contractor Special
NLGI  1   2
Castrol Contractor Special is a lithium complex extreme pressure lubricant containing 3% molybdenum disulfide. It is formulated to offer high temperature and heavy-duty performance with good pumpability and shear stability. Castrol Contractor Special excels in heavy-duty applications such as bucket pins and articulating joints where a tough, durable lubricating film is mandatory.

Castrol® HD Lithium
NLGI  000  00  0  2
Castrol HD Lithium is a lithium 12-hydroxy stearate, multi-purpose, extreme pressure grease that exhibits excellent low and high temperature performance, good water resistance and high shock load capacity. It excels in ball joint suspensions, universal joints, steering gears, anti-friction bearings, plain bearings, slides, ways and jibs. Castrol HD Lithium is intended for use on a ball and roller anti-friction bearings as well as conventional sleeve bearings; Castrol HD Lithium 00 Grease is intended for service where an NLGI 00 grade lithium grease is required, including some automatic grease systems.
Greases (cont’d)

Castrol® Fifth Wheel Grease
NLGI  2
Castrol Fifth Wheel Grease has been designed specifically for fifth wheel applications (on-highway vehicles) where stay-in-place performance is critical under all weather and application conditions. Castrol Fifth Wheel Grease’s graphite/moly formulation and high percentage of “tackifiers” give it a true affinity for metal surfaces.

Castrol® SHL 00
NLGI  00
Castrol SHL 00 is a synthetic, semi-fluid lubricant that provides excellent wheel end system lubrication, minimal leakage and exceptionally long service. It delivers low- and high-end temperature performance with extreme pressure and anti-wear additives.

Castrol® Open Gear 800
NLGI  1
Castrol Open Gear 800 is a synthetic lubricant that quiets noisy gears, increases gear life, and contains 10% solids to provide outstanding adhesion to metal surfaces under the toughest operating conditions. Castrol Open Gear 800 lowers lubrication costs and extends service intervals. It can be used in industrial open gears, dipper sticks and cables and drill bit couplings.

6. Coolant/Antifreeze

Castrol® Heavy Duty 50/50 Pre-Diluted Extended Life Coolant/Antifreeze™
Castrol Heavy Duty 50/50 Pre-Diluted Extended Life Coolant/Antifreeze is a 50/50 mix of heavy duty extended life coolant and deionized water. Castrol Heavy Duty 50/50 Pre-Diluted Extended Life Coolant/Antifreeze features a patented Organic Acid Technology (OAT) formula that delivers total cooling system protection for 1,000,000 miles of on-road use (8 years or 20,000 hours of off-highway use) without the use of Supplemental Coolant Additives (SCAs).

OEM Specifications:
ASTM D-3306, Behr Radiator, Caterpillar EC-1, Cummins 14603, Detroit Diesel 93K217, MAN 324 type SNF, Mercedes DBL 7700, MTU 5048, ASTM D-6210, John Deere H24A2/C2, Mack Truck SB232-014, Navistar B-1, TMC RP-329, Volvo VCS.

Castrol® Heavy Duty Antifreeze With SCA
Castrol Heavy Duty Antifreeze is designed to provide outstanding engine protection for heavy-duty cooling systems. Castrol Heavy Duty Antifreeze is a fully formulated universal formula antifreeze, having the advantages of low total dissolved solids, low silicate, and the incorporation of nitrite to provide outstanding wet sleeve liner cavitation protection. It is pre-charged with SCA, so it does not require the addition of Supplemental Coolant Additive (SCA) before usage. Castrol Heavy Duty Antifreeze with SCA meets the performance requirements of most major automotive specifications. Industry Specifications and OEM Approvals: TMC RP 329, ASTM D-6210, ASTM D-5345, GM 1899M, Cummins 90T8-4, Cummins 14603, Caterpillar (except CAT EC-1), Detroit Diesel 7SE298, Mack Truck, MTU, Navistar B-1, Freightliner 48-22880, Volvo-GM Heavy Truck, SAE J1941, John Deere H24A2/H24C2.

Castrol® Open Gear 800
NLGI  1
Castrol Open Gear 800 is a synthetic lubricant that quiets noisy gears, increases gear life, and contains 10% solids to provide outstanding adhesion to metal surfaces under the toughest operating conditions. Castrol Open Gear 800 lowers lubrication costs and extends service intervals. It can be used in industrial open gears, dipper sticks and cables and drill bit couplings.

Castrol® Premix Antifreeze With SCA
Castrol Premix Antifreeze with SCA is a premixed (50/50 pre-diluted) version of Castrol Heavy Duty Antifreeze with SCA combined with deionized water. The stability of the antifreeze is assured and guarantees optimum cooling system performance while controlling cavitation corrosion of cylinder liners and other cast iron components. Its phosphate-free formulation has a very focused inhibitor package to reduce the risk of inhibitor drop-out. Industry Specifications and OEM Approvals: TMC RP 329, ASTM D-6210, ASTM D-5345, GM 1899M, Cummins 90T8-4, Cummins 14603, Caterpillar (except CAT EC-1), Detroit Diesel 7SE298, Mack Truck, MTU, Navistar B-1, Freightliner 48-22880, Volvo-GM Heavy Truck, SAE J1941, John Deere H24A2/H24C2.
Castrol® Automotive Antifreeze
Castrol Automotive Antifreeze is a conventional (green), ethylene glycol based antifreeze with silicate additives to provide maximum year-round protection for the aluminum components of today’s car and light duty diesel engines. Castrol Automotive Antifreeze contains inhibitors that provide excellent protection from freezing to -84°F and boil-over to +276°F, and its patented formula protects all metals, including aluminum, against damaging rust and corrosion when used as recommended. It meets the requirements of car and light truck manufacturers. Industry Specifications and OEM Approvals: GM 1825M, Chrysler MS7170 sec. A & B 1-4, Ford ESE-M9844-a Sec. 3.1.1 & 3.12, ASTM D-4656, ASTM D-3306, ASTM D4340, John Deere H24C2, CID A-A-52624, SAE J1034, Volvo-GM Heavy Truck, SAE J1941, John Deere H24A2/H24C2.

7. Other Products

Castrol® Heat Transfer Oils 100 Light and 1590
ISO  22  46
Castrol Heat Transfer Oils have low pour points and offer excellent circulation during cold weather start-ups, eliminating over-heated pump motors and protecting against hot spots (high fluid temperature in the heat exchanger). Application Recommendations: Castrol Heat Transfer Oil 100 Light – in closed circulation systems with temperatures up to 287°C (550°F); Castrol Heat Transfer Oil 1590 – in closed circulation systems with temperatures up to 315°C (600°F).

Castrol® Rock Drill Oil
ISO  100  150  220
Castrol Rock Drill Oil has excellent extreme pressure and rust and corrosion protection. It also provides tackiness for adherence to drill surfaces. Castrol Rock Drill Oil has been tested by Ingersoll-Rand and Gardner-Denver laboratories and exceeded their requirements; and it is recommended for use with heavy-duty pneumatic rock drill applications such as Gardner-Denver, Chicago Pneumatic, Worthington, Ingersoll-Rand, and Joy, or with other air-operated tools that require an extreme pressure lubricant such as jackhammers, pavement breakers, smaller in-plant pneumatic tools, drills and wrenches.

Castrol® Turbine Oil
ISO  32
Castrol Turbine Oil contains carefully selected base stocks that are coupled with a proprietary additive package for exceptional performance in all turbine applications. It meets multiple industry original equipment manufacturers’ requirements.

Castrol® Way Lubricants
ISO  32  68  220
Castrol Way Lubricants are specially formulated for the sliding ways of machine tools. They meet the exacting demands of planners, grinders, horizontal boring machines, shapers, jig borers, milling machines and other equipment/applications involving moving parts. Castrol Way Lubricants meet the P47 and P50 specification for the stick slip test of the Cincinnati Lamb, and Castrol Way Lubricants 32 meets the requirements for Cincinnati Lamb P-53 specifications.

Castrol® ML-70 Form Oil
Castrol ML-70 Form Oil is a mineral-based form oil that is recommended for high quality architectural surface finishes on pre-cast concrete. Castrol ML-70 Form Oil’s specially formulated release agent provides a surface finish that is non-staining and minimizes air entrapment, thus reducing remedial costs and minimizing the chance of damage during stripping and cleaning.
8. Programs and Services

**Castrol® Labcheck Next Generation**
Redesigned with easy-to-use features and helpful shortcuts, Labcheck Next Generation is the most advanced, intuitive used oil analysis program in the industry. Labcheck Next Generation performs a variety of measurements, helping to save real dollars in maintenance, repairs and unscheduled downtime. Sample analysis is completed within 24-48 hours of receipt at the laboratory, and fleet information is available 24 hours a day at www.castrol.com/labcheck (login credentials required).

**HD Focus Newsletter**
*HD Focus* is a quarterly newsletter that offers customers insights on Castrol products, programs, services and HD industry news. To access the most current version of the *HD Focus* newsletter, as well as all archived online issues, visit www.castrolhdfocus.com.

**Castrol® Training Video: Truck Lubrication “Best Practices”**
The “Best Practices” video trains your employees on the proper way to safely and accurately service a Class 8 truck, because your profitability — and customer satisfaction — depend on it. This informative and comprehensive video shows step-by-step industry best practices for fluid changes, oil sampling, chassis lubrication, and more.

**Des-Case Program**
Des-Case specializes in contamination-control products for lubricants, with a complete line of desiccant breathers, fluid handling systems and equipment reliability services for improved fluid cleanliness, reduced equipment downtime, and increased equipment efficiency. Des-Case offers competitive pricing for Castrol customers along with technical, customer, and in-field support.

**Castrol® Oil Dispensing Containers**
Castrol Oil Dispensing Containers by Oil Safe improve handling practices, reduce contamination, and make jobs easier, faster, safer and cleaner. Durable, HDPE-plastic graduated drums measure up to 5 quarts/liters and feature a stretch spout lid and extra-wide necks for non-spill filling.

**Castrol® Equipment Program**
The Castrol Equipment Program offers professionally installed, high-quality lubrication equipment for storing and dispensing Castrol products in a safe and efficient manner. With competitive pricing and trade loan options, the program features equipment from Alemite, Graco and Raasm.
Current API Engine Oil Service Classifications

Gasoline Engines

**SN**
In 2010, the American Petroleum Institute introduced a new engine oil category under the name API SN and a new supplemental category called Resource Conserving. The API SN category is an improvement over the API SM category in the following areas: high temperature deposit protection for pistons, better sludge control, better seal compatibility, and after-treatment compatibility. Resource Conserving performance is commonly found in 0W-20, 0W-30, 5W-20, 5W-30, and 10W-30.

**SM**
Introduced in 2004, SM oils are designed to provide improved oxidation resistance, improved deposit protection, better wear protection and better low-temperature performance over the life of the oil, compared to previous API S categories. Some SM oils may also meet the latest ILSAC specification and/or qualify as Energy Conserving. They may be used where API Service Category SJ and SL earlier categories are recommended.

**SL**
Introduced July 1, 2001. SL oils are designed to provide better high-temperature deposit control and lower oil consumption, compared to previous API S categories. Some of these oils may also meet the latest ILSAC specification and/or qualify as Energy Conserving.

**SJ**
Meets 1997 Engine Warranty Service Requirements. Provides reduced phosphorus content to protect catalytic converters. Replaces all previous API “S” specifications.

Diesel Engines

**CJ-4**
The most up-to-date heavy-duty diesel specification. Introduced in October 2006 for high speed, 4-stroke diesel engines, designed to be compliant with all engine technology including pre-model year 2007. This legislation, known as US EPA 07, requires that all 2007 model year vehicles emit lower levels of nitrogen gases (NOx) and particulate matter (PM). The category was needed to match the availability of ultra low sulfur diesel (ULSD) fuel on the market late 2006 and to meet the needs of new engines equipped with exhaust aftertreatment devices. Optimum protection is provided for control of catalyst poisoning, particulate filter blocking, engine wear, piston deposits, low- and high-temperature stability, soot handling properties, oxidative thickening, foaming and viscosity loss due to shear. API CJ-4 oils exceed the performance criteria of API CI-4 with CI-4 Plus, CI-4, CH-4, CG-4 and CF-4 and can effectively lubricate engines calling for those API Service Categories.

**CI-4 Plus**
Introduced on September 1, 2004, API CI-4 Plus is an extension of the API CI-4 category, which did not meet a few key requirements in Exhaust Gas Recirculation (EGR) engines. After API CI-4 had been in the field, with the final engine designs, concerns were raised by the original equipment manufacturers (OEMs) regarding the way API CI-4 oils manage soot and the higher shear stresses seen in the new engines. To overcome these concerns, the industry developed and introduced the Mack T-11 engine test that measures the ability of the lubricant to control viscosity with the “new” soot that the EGR engines were producing. The industry also increased the severity of the Kurt Orbahn shear stability bench test from 30 to 90 cycles, which was found to more accurately represent the shear stresses that the new engines were placing on the oil.

**CI-4**
Introduced September 5, 2002, API CI-4 oils are for high-speed 4-stroke diesel engines designed to meet 2004 exhaust emission standards implemented in 2002. API CI-4 oils are formulated to sustain engine durability where exhaust gas recirculation (EGR) is used and are intended for use with diesel fuels ranging in sulfur content up to 0.5% weight. Can be used in place of CD, CE, CF-4, CG-4 and CH-4 oils.
**CH-4**  API CH-4 provides engine protection in heavily sooted environments of new engines that must meet today’s more stringent emission requirements.

**CG-4**  (Obsolete) For high-speed diesels in on- and off-road use, API CG-4 oils provide protection against deposits, corrosion, foaming and soot accumulation.

**CF-4**  (Obsolete) For 4-stroke cycle diesel engines, API CF-4 includes the replacement of Caterpillar 1G2 test with Caterpillar 1K and more severe pass/fail limits in the Cummins NTC-400 than for API CE.

**CF-2**  (Obsolete) For severe duty 2-stroke engine service, API CF-2 replaces CD-11. Oils that meet this standard must pass the 6V92TA test and the Caterpillar 1M-PC test.

**CF**  (Obsolete) For indirect-injected engines using a wide range of fuels, especially those with high sulfur content, API CF oils control deposits and inhibit bearing corrosion.

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**Resource Conserving**

This is a category of oils that provide less fuel consumption than the API’s standard reference test oil and are licensed as “Energy Conserving” with the API.

![API SN Resource Conserving](image)

**API ILSAC GF-5**

In order to display the API certified symbol or starburst, a motor oil must comply with all the requirements of API SN plus specific phosphorus requirements and also fuel economy performance as measured by the ASTM Sequence VID test.

![API ILSAC GF-5](image)

For more information about Castrol products and services, please call **1 800 255 4417**.

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www.castrol.com/GPS