

Bid Number: ITB-DOT-11/12-1086-LR

TECHNICAL SPECIFICATIONS

1. DRUM PICK-UP:

The successful vendor shall pick-up all empty drums as they become available. This includes any drums left over from the previous contract vendor(s). Agencies are to inform the vendors(s) of the quantity of empty drums that shall be picked up.

2. DRUM DEPOSIT:

There is no drum deposit levied on returnable drums.

3. DEFINITIONS:

API Certification – The American Petroleum Institute Engine Oil Licensing and Certification System (APIEOLCS) requires that all oils pass the same cold-start, pump ability, rust-corrosion, engine wear and high temperature viscosity tests, so that consistent performance standards for all engine oils are met.

ASTM Standards – The American Society for Testing and Materials specifies the exact way in which a product is to be tested, including the rule, techniques and conditions which **must** be adhered to in engineering design so that all manufacturers are working with the same procedures and values.

SAE – The Society of Automotive Engineers works with API and ASTM in developing and maintaining testing and licensing requirements for various oils and lubricants.

Virgin products are those made with 100% new/raw materials and contain no recycled content.

TECHNICAL SPECIFICATION

The specifications cover the grades of virgin petroleum oil and lubricants, which will be suitable for use in internal combustion engines, transmissions and grease applications. These products shall not be adulterated with waste lubricants or similar products.

The oils and lubricant products shall be manufactured in accordance with recognized industry and vehicle/engine manufacturers' specifications. The Supplier shall inspect each shipment to ensure that each delivered lot meets the specifications and is not contaminated at the time of delivery. Deliveries of product under this specification shall be subject to quality testing by the Department to ensure compliance with the specifications. The Supplier may be asked to provide lab analyses of products at its expense, including at a minimum the following information: viscosity, viscosity index, contents of additive package, and fingerprint chemical analysis. During the term of the contract, Supplier shall notify the purchaser of any changes in product formulation within thirty (30) days of the product reformulation.

All metal drums must be contaminant free, new or reconditioned drums. Reconditioned drums shall meet the most current Class 1 requirements of Federal Specification PPP-D-732C. All

containers and drums shall be filled and sealed at suppliers' refinery. The following information shall be stenciled on each drum unless the vendor as a re-packing agreement. If containers are being filled under a repackaging agreement, a copy of the agreement shall accompany your proposal.

1. API Number and S.A.E. Number
2. The proper specification number, military or otherwise, where applicable.
3. Trade name of material
4. Supplier's name

All items submitted shall be the producer's highest quality. Normal industry-wide manufacturing tolerances will be acceptable. Acceptable manufacturers should have any required licenses with the American Petroleum Institute (API) for current service requirement classifications.

A. PASSENGER VEHICLE MOTOR OIL (Single and Multi-Viscosity)

CHEVRON SUPREME MOTOR OILS

SAE 5W-20, 5W-30, 30

PRODUCT DESCRIPTION

Premium automotive motor oil that protects against deposit and sludge formation and provides excellent wear protection to critical engine parts.

CUSTOMER BENEFITS

Chevron Supreme Motor Oils deliver value through:

- **Excellent antiwear protection**
- **Protection against thermal breakdown**
- **Clean engines** and positive crankcase ventilation systems resulting in minimal deposits under heavy load and stop-and-go driving conditions.
- **Meets or exceeds warranty requirements** of car and light truck manufacturers relying on an API SN, SM, SL or SJ service category motor oil.
- **Energy Savings** — API Resource Conserving designation for SAE 5W-20, 5W-30 and 10W-30 grades

FEATURES

Chevron Supreme Motor Oils are premium quality automotive engine oils.

All grades are formulated with high quality base stocks, and robust additive packages including shear-stable viscosity index improvers, detergents, dispersants, anti-wear agents, corrosion inhibitors, antioxidants and foam inhibitors.

Their anti-wear additives provide excellent wear protection of critical engine parts.

A high level of dispersancy in Chevron Supreme Motor Oils protects against deposit and sludge formation in stop-and-go driving, sustained high temperature operation, and protects against corrosion.

Their excellent high temperature oxidation stability helps prevent viscosity increase and oil gelling in the crankcase. They help keep PCV systems clean to maintain smooth engine performance.

APPLICATIONS

Chevron Supreme Motor Oils are suitable for use in four-stroke gasoline engines used in passenger cars, light trucks, powerboats, motorcycles, and other mobile and stationary equipment. They are excellent for high-revving engines in small cars and light trucks.

All grades are suitable for use in turbocharged engines.

SAE 5W-20 provides optimum fuel economy and durable performance. It is suitable for use in Ford and Honda vehicles specifying this viscosity grade.

SAE 5W-30 is recommended by the majority of auto manufacturers for their late model North American vehicles, under a wider variety of weather conditions. It provides excellent cold weather performance and carries the API Resource Conserving designation.

Chevron Supreme Motor Oils **SAE 30** and **SAE 40** can be used in engine applications where an SAE 30 or SAE 40 passenger car motor oil of API SN or any previous

Chevron Supreme Motor Oils – Continued

“S” category is recommended. They perform exceptionally well in small four-stroke engines found in lawn mowers, garden tractors, snow blowers, and in refrigeration or air-conditioning engines on trucks and buses.

Note: Always consult your owner’s manual regarding viscosity grade for your application.

Chevron Supreme Motor Oils meet:

- **API Service Categories**

- SN
- SM, SL, SJ and all previous API “S” categories
- Resource Conserving for API SN (SAE 5W-20, 5W-30, 10W-30)
- ILSAC GF-5 (SAE 5W-20, 5W-30, 10W-30)

- **Manufacturers’ performance requirements**

- **Daimler Chrysler**
MS-6395 (SAE 5W-20, 5W-30, 10W-30)
- **Ford**
WSS-M2C945-A (SAE 5W-20) WSS-M2C946-A (SAE 5W-30)
- **General Motors**
GM 6094 (SAE 5W-20, 5W-30, 10W-30)

- **Department of Defense Commercial Item Description (CID)**

- SAE J2362 (formerly CID A-A-52039¹) (SAE 5W-30, 10W-30)

TYPICAL TEST DATA

SAE Grade	5W-20	5W-30	30
<i>Product Number</i>	220135	220013	220002
<i>MSDS Number</i>	17483	17483	6717
API Gravity	32.9	32.6	29.5
Viscosity, Kinematic cSt at 40°C cSt at 100°C	47.5 8.0	59.4 9.7	80.8 10.3
Viscosity, Cold Crank, °C/Poise	-30/47	-30/54	—
Viscosity Index	146	151	107
Flash Point, °C(°F)	>200(392)	>200(392)	>205(401)
Pour Point, °C(°F)	-37(-35)	-36(-33)	-33(-27)
Sulfated Ash, wt %	0.8	0.8	0.9
Base Number, ASTM D2896	7.7	7.7	7.8
Phosphorus, wt %	0.078	0.078	0.099
Zinc, wt %	0.086	0.086	0.110

TECHNICAL SPECIFICATIONS

B. HEAVY TRUCK MULTI-VISCOSITY GRADE

DELO® 400 LE

SAE 15W-40

PRODUCT DESCRIPTION

"The Delo® Performance Advantage™"

Delo® 400 LE SAE 15W-40 is a mixed fleet motor oil recommended for naturally aspirated and turbocharged four-stroke diesel engines and four-stroke gasoline engines in which the API CJ-4 service category and SAE 15W-40 viscosity grade are recommended.

CUSTOMER BENEFITS

Delo 400 LE SAE 15W-40 is an API CJ-4 heavy duty engine oil specifically formulated for 2007 Exhaust Gas Recirculation (EGR) with Diesel Particulate Filter (DPF) and 2010 EGR with DPF and EGR/Selective Catalytic Reduction (SCR) with DPF low emission engines. It is fully compatible with previous engine models and previous API Oil Service Categories. It delivers value through:

- **Minimized operating costs** — Exceptional soot dispersancy and wear control. Cylinders, pistons, rings, and injectors are well protected against wear and corrosion, providing optimum service life and minimal maintenance. Contributes to maximum vehicle utilization and minimal downtime.
- **Excellent emission control system life** — Provides optimum Diesel Particulate Filter (DPF) life for minimal downtime and cleaning, thus managing your maintenance costs.
- **Managed inventory costs** — Backward compatible with previous API Oil Service Categories and engine models. Suitable for use in four-stroke gasoline and naturally aspirated, turbocharged and modern electronically controlled/low emission diesel engines calling for an SAE 15W-40 heavy duty motor oil. Allows users with a wide mix of engine brands to enjoy simplified inventory and dispensing systems that may contribute to saving money, space and handling time.

- **Warranty Plus protection** — Bumper-to-bumper warranty protection from the engine to the drive train. Payment for Chevron lubricant-related damage to your equipment, including parts and labor.¹ Problem resolution and technical advice from Chevron's lubrication experts.
- **Access to Chevron's lubrication and industry knowledge** — Help maximize your bottom line business results.

FEATURES

Delo 400 LE SAE 15W-40 is an industry leading, super premium quality engine oil which exceeds industry and engine manufacturers' performance requirements. It is the most recommended OEM viscosity grade for over-the-road and off-highway diesel engines.

RIVALS SYNTHETIC PERFORMANCE
ISOSYN
TECHNOLOGY™

It is formulated using the most advanced additive technology available to provide outstanding engine protection for 2007 and 2010 EPA exhaust particulate emissions standards for on highway diesel trucks, using Ultra Low Sulfur Diesel (ULSD).

Delo 400 LE SAE 15W-40 is formulated with ISOSYN® Technology, which rival synthetics in critical performance tests, and contains an optimal blend of the latest technology in dispersant, detergent, oxidation inhibition, antiwear, corrosion inhibition, viscosity improver, and defoaming additives.

Today, Delo 400 LE SAE 15W-40 meets the most stringent EGR soot control and particulate requirements.

Delo® 400 LE SAE 15W-40 has been specifically designed to meet the demands of EGR and SCR engines while at the same time providing exceptional performance in conventional engines and other engine technologies like Caterpillar ACERT.

FUNCTIONS

Delo 400 LE SAE 15W-40 helps keep rings clean and free for maximum combustion pressure and minimal wear. Delo 400 LE SAE 15W-40 minimizes valve and piston crown land deposits, leading to minimal oil consumption. Its high level of ashless dispersants keeps fuel soot in suspension and helps avoid filter plugging, heavy cylinder head sludge, abrasive polishing wear, high viscosity increase, and oil gelling. These problems can result in excessive engine wear and bearing failure on startup, without prior indication to the operator.

Specially selected oxidation inhibitors control oxidation, sludge, and undue thickening during oil drain periods. Delo 400 LE SAE 15W-40's unique blend of extreme pressure antiwear additive protects against valve train wear and scuffing of highly loaded parts operating under boundary lubrication. A specially selected viscosity index improver ensures easy flow at low temperatures and excellent film protection in hot engine areas. A defoaming additive prevents air entrapment.

The combination of premium dispersant additives and ISOSYN® Technology allows Delo 400 LE SAE 15W-40 to effectively disperse soot and keep it in suspension. This minimizes the risk of valve train wear, lever polishing, and filter plugging.

APPLICATIONS

Delo 400 LE SAE 15W-40 is a mixed fleet motor oil recommended for naturally aspirated and turbocharged four-stroke diesel engines and four-stroke gasoline engines in which the API CJ-4 service category and SAE 15W-40 viscosity grade are recommended. It is formulated for engines operating under severe service and a wide range of climatic conditions.

Delo 400 LE SAE 15W-40 is excellent for use in new advanced engines developed in response to 2007 emissions standards and in engines equipped with features like four-valve heads, supercharging, turbocharging, direct injection, shorter piston crowns, higher power density, intercooling, full electronic

management of fuel and emissions systems, exhaust gas recirculation, and exhaust particulate traps.

It is formulated for exceptional performance with Ultra Low Sulfur Diesel but also with both normal and low sulfur diesel fuels.

This product is recommended for use in older engines, as well as in today's most modern low emission designs.

This product is recommended for use in Caterpillar engines in off-highway or construction applications which require an API CJ-4 Service Category.

Delo 400 LE SAE 15W-40 is approved for:

- **API Service Categories** CJ-4, CI-4 PLUS, CI-4, CH-4, CF, SM, SL
- **Cummins** CES 20081
- **Daimler** MB 228.31
- **DDC** Power Guard 93K218
- **Mack** EO-O Premium Plus 07
- **MAN** 3575
- **MTU** Category 2.1
- **Volvo** VDS-4

Delo 400 LE SAE 15W-40 meets the requirements of:

- **Caterpillar** ECF-3, ECF-2
- **JASO** DH-2
- **ACEA European Service Categories** E9-08, E7-08
- **major diesel engine manufacturers':**
 - Caterpillar
 - Cummins
 - Detroit Diesel
 - JASO
 - MACK
 - Man
 - Mercedes
 - Volvo

TYPICAL TEST DATA

SAE Grade	15W-40
<i>Product Number</i>	222220
<i>MSDS Number</i>	17108
API Gravity	29.1
Viscosity, Kinematic cSt at 40°C cSt at 100°C	125 15.7
Viscosity, Cold Crank, C/Poise	-20/64
Viscosity Index	131
Flash Point, °C(°F)	> 204(399)
Pour Point, °C(°F)	-33(-27)
Sulfated Ash, wt %	1.0
Base Number, ASTM D2896	9.6
Phosphorus, wt %	0.12
Sulfur, wt %	0.32
Zinc, wt %	0.13

TECHNICAL SPECIFICATION

C. AIR COOLED TWO CYCLE MOTOR OIL

CHEVRON 2-CYCLE OIL TC-W3®

PRODUCT DESCRIPTION

Chevron 2-Cycle Oil TC-W3® is a general purpose oil for air and water cooled 2-cycle engines.¹

CUSTOMER BENEFITS

Chevron 2-Cycle Oil TC-W3 delivers value through:

- **Exceptionally clean engines** with minimum combustion chamber deposits, negligible port clogging, clean ring grooves, and free rings.
- **Excellent rust protection**
- **Long spark plug life**
- **Easy mixing and stable mixtures with gasolines** even at low ambient temperatures.

FEATURES

Chevron 2-Cycle Oil TC-W3 is a high quality two stroke engine lubricant that delivers excellent performance in water-cooled and air-cooled applications. It is formulated to provide excellent lubrication and deposit control in a wide range of applications.

Chevron 2-Cycle Oil TC-W3 contains a special ashless detergent designed to help keep piston rings from sticking promoting smooth and efficient engine operation. Chevron 2-Cycle Oil TC-W3 will help keep the engine clean of deposits and will also protect the pistons from scuffing and preignition problems.

To enhance storage and transportation safety, Chevron 2-Cycle Oil TC-W3 contains a high flash solvent. This solvent also allows good mixing with gasoline at very low temperatures.

It is dyed teal blue for easy identification of fuel-oil mixtures in pre-mixed applications.

APPLICATIONS

Chevron 2-Cycle Oil TC-W3 is recommended for use in two-stroke engines where TC-W3 or earlier general purpose lubricants are recommended. These applications include outboard engines, snowmobiles, motorcycles, lawn mowers, scooters, golf carts, chain saws, and other two-stroke powered equipment.

Chevron 2-Cycle Oil TC-W3 is well suited for engines using oil injection systems with fuel/oil mixture ratios of up to 150:1.

Chevron 2-Cycle Oil TC-W3 has excellent low temperature mixing characteristics that make it suitable for use in cold climate conditions.

Chevron 2-Cycle Oil TC-W3:

- is licensed under the NMMA TC-W3 performance standard
- is formulated to meet ISO-L EGB (JASO FB) passing criteria
- is formulated to meet API TC requirements for use in air-cooled two-stroke applications

The mixing chart below is a guide for correct fuel-blend ratios as recommended by engine manufacturers.

Ounces of oil to add

Gallons of Gasoline	1	2	3	4	5	6
16:1 Ratio	8	16	24	32	40	48
24:1 Ratio	5	11	16	21	27	32
32:1 Ratio	4	8	12	16	20	24
50:1 Ratio	3	5	8	11	13	16
100:1 Ratio	2	3	4	6	7	8

TYPICAL TEST DATA

<i>Product Number</i>	226477
<i>MSDS Number</i>	5484
<i>API Gravity</i>	32.0
<i>Viscosity, Kinematic cSt at 40°C</i>	49.0
<i>Viscosity, Brookfield, cP at -25°C</i>	5500
<i>Flash Point PM, °C(°F)</i>	109(228)
<i>Pour Point, °C(°F)</i>	-33(-27)
<i>Sulfated Ash, wt %</i>	0
<i>Base Number, ASTM D2896</i>	5.1

TECHNICAL SPECIFICATION

D. UNIVERSAL GEAR OIL

DELO[®] GEAR LUBRICANTS ESI[®]

SAE 80W-90

PRODUCT DESCRIPTION

Delo[®] Gear Lubricants ESI[®] are premium grade automotive gear lubricants designed for gears operating under severe temperature and load conditions.

CUSTOMER BENEFITS

Delo Gear Lubricants ESI deliver value through:

- **Minimal wear** — Delo Gear Lubricants ESI are formulated to promote long life for gears, bearings, and seals.
- **Seal compatibility** — Seal materials are not adversely affected by Delo Gear Lubricants ESI at temperatures as high as 163°C (325°F).
- **Low operating temperatures** — Unique additive chemistry minimizes friction resulting in cool operating temperatures.
- **Long lubricant life** — The outstanding thermal and oxidation stability characteristics of Delo Gear Lubricants ESI allow for optimal drain intervals which can result in lubricant savings.
- **Fuel savings** — The remarkable low friction properties of this product contribute to minimal energy consumption.
- **Compatibility** — Compatible with conventional sulfur-phosphorus and synthesized hydrocarbon based lubricants.

FEATURES

Delo Gear Lubricants ESI are premium grade automotive gear lubricants.

They are formulated with ISOSYN[®] Technology and compounded with a unique extreme pressure additive utilizing an inorganic borate compound. They also

RENALS SYNTHETIC PERFORMANCE
ISOSYN
TECHNOLOGY

contain a patented, synergistic combination of additives that protect against wear, seizure, oxidation, corrosion, rust, and foam.

Delo Gear Lubricants ESI are ideally suited for gear sets exposed to extremely high temperatures and loads.

Tests have proven that Delo Gear Lubricants ESI provide a wear protection film 3 to 5 times thicker than the conventional sulfur-phosphorus antiwear film. The inorganic borate film is composed of compounds that do not react with metal. The film forms promptly to provide exceptional gear protection and maximum thermal stability. By minimizing friction, cool operating temperatures have been observed.

APPLICATIONS

These lubricants are excellent automotive gear lubricants, particularly those operating under severe temperature and load conditions. They provide excellent wear control even in the presence of small amounts of water. Their exceptional thermal and oxidation stability, and antiwear performance promote long gear life and optimal drain intervals.

Delo Gear Lubricant ESI **SAE 80W-90** was field tested in more than 100 on-highway, Class 8 trucks with drain intervals of 500,000 to 750,000 miles. The product showed excellent field results in axles manufactured by **Dana**, **ArvinMeritor**, and **Mack**. It is approved for the extended drain specifications of both **ArvinMeritor** and **Mack**.

Delo Gear Lubricants ESI:

- meet the performance requirements of **API Service Categories** GL 4, GL-5, and MT-1
- are qualified for **SAE J 2360** (formerly known as MIL-PRF-2105E)
- are approved for **ArvinMeritor** TP-9539 up to 500,000 mile initial and service fill (refer to

Delo® Gear Lubricants ESI® — Continued

manufacturer's recommendations for extended drain lubricants)

- are approved for **Mack GO-J PLUS** up to 500,000 mile initial and service fill (SAE 80W-90; refer to manufacturer's recommendations for extended drain lubricants)

TYPICAL TEST DATA

SAE Grade	80W-90
<i>Product Number</i>	224503
<i>MSDS Number</i>	6698
API Gravity	27.7
Viscosity, Kinematic cSt at 40°C cSt at 100°C	140 14.2
Viscosity, Brookfield cP at -12°C cP at -26°C	— 115,000
Viscosity Index	99
Flash Point, °C(°F)	210(410)
Pour Point, °C(°F)	-33(-27)
Timken OK Load, lb	75

TECHNICAL SPECIFICATION

E. SYNTHETIC GEAR LUBRICANT

DELO® SYNTHETIC GEAR LUBRICANT

SAE 75W-90, 80W-140

PRODUCT DESCRIPTION

Delo® Synthetic Gear Lubricant is a premium heavy duty, extreme pressure, multigrade automotive gear lubricant.

CUSTOMER

BENEFITS

"The Delo®Performance Advantage™"

Delo Synthetic Gear Lubricant delivers exceptional value through:

- **Extended drain capabilities** — Meets the requirements of major axle manufacturers for extended drains.
- **Excellent thermal and oxidation stability** — The synthetic hydrocarbon base oil used in this product provides outstanding stability.
- **High viscosity index and low pour point** — The synthetic hydrocarbon base stock provides extremely broad operating temperature ranges when compared with conventional mineral oil based lubricants.
- **Excellent seal compatibility** — This product is compatible with many widely used seal elastomers.
- **Refill and top off compatibility** — Delo Synthetic Gear Lubricant is compatible with conventional mineral oil based and other synthetic automotive gear lubricants.
- **Warranty Plus Protection** — Bumper-to-bumper warranty protection from the engine to the drivetrain that covers lubricant-related damage to your equipment, including parts and labor.* Problem resolution and technical advice from Chevron's lubrication experts.
- **Access to Chevron's lubrication and industry knowledge** — Maximizes the bottom line business results of trucking industry professionals.

FEATURES

Delo Synthetic Gear Lubricant is a premium heavy duty, extreme pressure, multigrade automotive gear lubricant. It is manufactured from synthesized hydrocarbon base fluids which have excellent thermal and oxidation stability, a high viscosity index, and a low pour point.

The low pour point of Delo Synthetic Gear Lubricant imparts excellent lubrication during startup at subzero temperatures, while the outstanding viscosity temperature characteristics provide excellent lubrication at high temperatures. Lower frictional losses in the lubricant film and reduced churning losses due to lower bulk oil viscosity lead to reduced operating temperatures when compared to conventional gear lubricants.

APPLICATIONS

Delo Synthetic Gear Lubricant is recommended as a rear axle and differential lubricant in over-the-road and off-road vehicles when operating under severe conditions and in extremely cold or hot environments. Delo Synthetic Gear Lubricant meets and exceeds the requirements of API Service Categories GL-4, GL-5 and MT-1. In addition, it is approved for:

- **Dana Corporation, Spicer Axle Division**
 - SHAES 256 REV C (SAE 75W-90 only)
- **Mack GO-J Plus** (SAE 75W-90 only)
- **Meritor O-76 Extended Drain**
- **SAE J2360** (formerly MIL-PRF-2105E)
- **STEMCO PPS+ and PPS wheel end systems** (SAE 75W-90 only)

The claims apply to both viscosity grades unless indicated otherwise.

These approvals allow the use of Delo® Synthetic Gear Lubricant in **Dana, Eaton, and Meritor** axles with

Delo® Synthetic Gear Lubricant — Continued

500,000-mile drain intervals and 750,000-mile extended equipment warranty.

TYPICAL TEST DATA

SAE Grade	75W-90
<i>Product Number</i>	236100
<i>MSDS Number</i>	20229
API Gravity	31.9
Viscosity, Kinematic cSt at 40°C cSt at 100°C	106 14.9
Viscosity, Brookfield cP at -26°C cP at -40°C	— 105,000
Viscosity Index	146
Flash Point, °C(°F)	180(356)
Pour Point, °C(°F)	-54(-65)

TECHNICAL SPECIFICATION

F. MULTI-PURPOSE GREASE

DELO[®] GREASES EP NLGI 2

PRODUCT DESCRIPTION

Delo[®] Greases EP are technically advanced, extreme pressure greases for a wide variety of on-road applications.

CUSTOMER BENEFITS

Delo Greases EP deliver value through:

- **Extreme pressure high load carrying capacity**
- **Excellent corrosion and wear protection**
- **Excellent water resistance**
- **Excellent high temperature stability**
- **Outstanding low temperature pump ability**

FEATURES

Delo Greases EP are technically advanced, extreme pressure greases for a wide variety of on-highway and light duty off-road applications.

FORMULATED WITH
ISOSYN
TECHNOLOGY

They are formulated with highly refined base stocks, a lithium complex thickener, rust and oxidation inhibitors, and extreme pressure and tackiness additives. They are blue in color with a tacky texture.

They are engineered to minimize friction and wear with a thick, velvety coating for excellent load carrying protection.

Delo Greases EP are specially formulated for extreme pressure wheel bearing and chassis applications including the steering drag links, king pins, transmission cross shaft spring pins, shackle pins, brake cam shafts, and fifth wheel faceplates and pivots operating under high and low temperature conditions.

The high viscosity index base oil makes these products perfect for the centralized lubrication systems found on today's mobile equipment.

These products are formulated to perform in unusually demanding conditions of high and low temperatures. The lithium complex thickener in Delo Greases EP elevates the dropping point to approximately 266°C (510°F). This high dropping point equates to excellent high temperature stability up to 177°C (350°F).

Delo Greases EP have the proper base oil viscosity to meet NLGI GC-LB requirements for low temperature operation. **NLGI 1** and **2** are recommended for applications operating in the temperature range of -18°C to 177°C (0°F to 350°F). **NLGI 00** and **0** can be used at temperatures as low as -34°C (-30°F).

Delo Greases EP exceed the requirements of NLGI GC-LB for EP protection and rust protection, making them well suited for the most severe applications.

APPLICATIONS

Delo Greases EP are designed for extreme duty in a wide variety of on-highway and light duty off-road vehicle and equipment applications.

On-highway heavy duty trucks — These lubricants are perfect for a wide variety of Class 8 trucks in most chassis and wheel bearing applications ranging from automatic centralized greasing systems to wheel bearings operating near the high temperatures of disc brakes. This product is for most applications, from owner/operators to fleets (especially those considering extended service intervals).

Light Duty Off-Road vehicles — Whether the application is in logging, agriculture or utilities, these greases will perform. Use them in tractors, cherry pickers or any of a number of light duty off-road vehicles. For heavy-duty construction and mining applications, please refer to the Chevron Delo HD Grease product data sheet.

Delo® Greases EP – Continued

Medium- and light-duty trucks and buses

—As with their heavy duty counterparts, the Class 7 and Class 6 vehicles and buses require an extreme duty grease. Delo® Greases EP will provide that performance.

Automobiles — Delo Greases EP are exceptional lubricants for high temperature wheel bearings and other high performance automotive applications.

NLGI 1 and 2 are approved for the NLGI Certification Mark GC-LB.

Delo Greases EP NLGI 2 meets the requirements of the Mack MG-C grease specification.



Delo® Greases EP - Continued

TYPICAL TEST DATA

NLGI Grade	2
<i>Product Number</i>	<i>235208</i>
<i>MSDS Number</i>	<i>6818</i>
Operating Temperature, °C(°F) Minimum ¹	-40(-40) 177(350)
Penetration (Worked 60 Strokes), at	280
Dropping Point, °C(°F)	265(509)
Four Ball Weld Point, kg	400
Four Ball Wear Scar, mm	0.45
Timken OK Load, lb	70
Water Washout, wt%	5
Water Spray-off, wt%	20
Lincoln Ventmeter, psig at 30 s, at 75°F 30°F 0°F -22°F	— 250 700 1400
Copper Corrosion	1b
Bearing Rust, 5% Synthetic Sea Water	Pass
Thickener, % Type	11.0 Lithium Complex
ISO Viscosity Grade Base Oil Equivalent	220
Viscosity, Kinematic* cSt at 40°C cSt at 100°C	189 17.5
Viscosity, Saybolt* SUS at 100°F SUS at	992 90
Viscosity Index	.100
Flash Point, °C(°F)*	274(525)
Oil Separation, wt%	2
Texture	Tacky
Color	Blue

TECHNICAL SPECIFICATION

G. HEAVY-DUTY EP 2

DELO[®] HEAVY DUTY EP 2

PRODUCT DESCRIPTION

Delo[®] Heavy Duty EP is a comprehensive line of greases that are available with or without molybdenum disulfide. These greases are designed for plain and anti-friction bearing applications operating under high stress/high load conditions, coupled with high ambient temperatures typically found in heavy duty off-road applications.

CUSTOMER BENEFITS

Delo Heavy Duty EP, Delo Heavy Duty Moly 3% EP and Delo Heavy Duty Moly 5% EP greases deliver value for the off-road construction and mining industries by offering:

- **Excellent corrosion and wear protection**
- **Excellent water resistance** in both submerged and direct pressure spray situations
- **Excellent shock load protection**

FEATURES

Formulated with Chevron highly refined base stocks, Delo Heavy Duty EP greases are multipurpose, high performance products specially formulated for plain and anti-friction bearing applications operating under high stress/high load conditions, coupled with high ambient temperatures typically found in heavy duty off-road applications. Developed as a true contractors product, this line of grease was specifically designed to lubricate and protect equipment that is subjected to demanding conditions.

FORMULATED WITH
ISOSYN
TECHNOLOGY

Delo Heavy Duty EP greases are manufactured using select, highly refined, high viscosity base oils using a lithium complex thickener system that includes excellent rust and oxidation inhibitors coupled with extreme pressure and tackiness additives. The non-moly version is red in color and stringy in texture. Additionally, this comprehensive line includes 3% and 5% moly versions to meet the demands of OEM manufacturers who require molybdenum disulfide in the grease to meet required warranty specifications. These products are grey/black in color and stringy in texture.

The lithium complex thickener in Delo Heavy Duty EP greases elevates the dropping point to approximately 265°C (510°F) making them excellent for use in applications where sustained high operating temperatures are common. Additionally, since they are all comprised of the same base formulation, they are compatible with one another.

APPLICATIONS

These greases are recommended for applications operating in the temperature range of -26°C to 177°C (-15°F to 350°F). Please refer to the notes on the next page regarding cold weather performance.

Delo Heavy Duty EP greases are not intended for use in high-speed bearing applications such as those found in electric motors due to the greases' high viscosity base stocks formulation. When in doubt, please consult your Chevron representative or OEM maintenance manual for application parameters when considering a switch to these greases.

Delo® Heavy Duty EP 2— Continued

Delo® Heavy Duty EP greases are ideal for a wide variety of Off-Road Construction applications across several industries:

- **Off-Road Construction** — These greases display outstanding water washout and spray-off resistance properties in wet, off-road environments and offer excellent shock load extreme pressure (EP) protection. Unique additive technology of these products makes them tenacious at adhering to metal surfaces found in this industry while protecting these vital components from rust and corrosion. Applications for the product include most types of heavy-duty earth moving machinery, including tractors (dozers), excavators, backhoes, shovels, high lifts, articulated loaders, haul trucks, tri-axle dumps and more. They are excellent for heavily loaded machine implement pins and bushings, and other applications operating in severe, high shock- load environments where metal to metal contact wear often occurs. Since Delo Heavy Duty EP greases are offered in 3% and 5% moly containing versions, they are also able to meet wide off-road OEM application ranges using one common product line, thus reducing field inventory. Because they are lithium complex thickened, the non-moly version is also excellent for mixed fleet applications where disc brake lubrication is required, such as pick-up trucks.
- **Surface and Underground Mining and Quarry**
 - Applications appropriate for these greases include those found above plus pins and bushings on buckets, loaders, shovels and continuous miners, shaker screens, crushers, and conveyors.
- **Agriculture** — Will serve as an excellent multi-purpose heavy duty lubricant for both general and industrial farm and agricultural use, from medium to heavy duty front steer and articulated tractors and loaders to larger new rubber tracked units. These products will work well in many applications including three point hitches, high lift pins and bushings and other heavy duty farm related industrial machinery.
- **Heavy Duty On/Off Highway Road Construction and Maintenance Vehicles** — These products are well suited for greasing on/off road heavy duty tri-axle dump trucks and cement mixers that also find their way off road as much as on. Delo Heavy Duty EP greases are an excellent choice for kingpins, bushing and bucket pins, 5th wheels and other severe duty applications found on these types of vehicles. They are also ideally suited for on highway heavy duty applications as well as airport fixed ground operation snow and ice removal

equipment, such as plows, blowers and salt spreaders when the preferred method of lubrication is by manual application. These products were formulated using a new rust inhibitor package tested with 0.5% mixtures of magnesium chloride and calcium chloride road de-icers and were proven to reduce rust and corrosion when these corrosive materials were present. In colder climates, the NLGI 1 grade versions would be preferred product of choice. (See note below for severe cold weather operations.)

Delo Heavy Duty EP greases meet the requirements of the Mack MG-C grease specification. They also meet Caterpillar recommendations for greases containing 3% and 5% molybdenum disulfide.

Note 1: Delo Heavy Duty EP greases are designed using high viscosity base oils. These oils offer excellent protection in severe duty, high shock load conditions where typical ambient temperatures are above freezing. In cold weather climate conditions, these products are not recommended for applications involving centralized automatic grease dispensing systems. Because each application varies, this does not mean these products will not work in centralized systems, only that you need to consult your equipment OEM or Chevron Lubrication Specialist before switching over to these products in cold weather operation.

Note 2: In cases where centralized automatic dispensing systems or long manual grease runs are the preferred method of lubrication and normal operating temperatures are consistently well below 20°F, Delo Greases EP, available in NLGI grades 2, 1, 0 and 00, would offer better pumpability. They would also be the preferred choice for onboard vehicle lubrication systems operating in severe cold weather service. Delo Greases EP are blue in color and are fully compatible with Delo Heavy Duty EP greases. Please consult your local Chevron Lubrication Specialist should you have any concerns in this regard.

TYPICAL TEST DATA

	EP 2
<i>Product Number</i>	222206
<i>MSDS Number</i>	23598
Molybdenum Disulfide content%	—
Operating Temperature, °C(°F) Minimum ¹ Maximum ²	-26(-15) 177(350)
Penetration, at 25°C (77°F) Worked, 60 strokes	280
Dropping Point, °C(°F)	265(509)
Four Ball Weld Point, kg Wear, Scar Diameter,	500 0.43
Timken OK Load, lb	80
Load Wear Index, kg	75
Bearing Water Washout, wt % Loss at 175°F	4
Water Spray-off, % at 100°F	15
EMCOR Dynamic Bearing Rust, 10% Synthetic Sea Water, ASTM D6138	0,0
Lincoln Ventmeter, psig at 30 s, at 75°F 30°F 0°F -22°F	625 1600 1800 †
DIN 51805, psi 68°F (20°C) 32°F (0°C) -4°F (-20°C) -22°F	2 5 22 max pres- sure
Copper Corrosion	1b
Thickener, % Type	13.0 Lithium Complex
ISO Viscosity Grade Base Oil Equivalent	320

Delo® Heavy Duty EP 2— Continued

	EP 2
Viscosity, Kinematic* cSt at 40°C cSt at 100°C	383 25
Viscosity, Saybolt* SUS at 100°F SUS at 210°F	2058 124
Viscosity Index	85
Oil Separation, wt%	2
Flash Point, °C(°F)*	274(525)
Texture	Stringy
Color	Red

CHEVRON HYDRAULIC OILS AW

ISO 68

PRODUCT DESCRIPTION

Chevron Hydraulic Oils AW are designed to give excellent hydraulic pump protection.

CUSTOMER BENEFITS

Chevron Hydraulic Oils AW deliver value through:

- **Good oxidation stability** — Provide good service life in high pressure service.
- **Rust and corrosion protection** — Give excellent protection against corrosion of both copper and steel, and passes the ASTM D665A distilled water rust test and ASTM D665B synthetic sea water rust test.
- **Minimum viscosity change** over a wide temperature range.
- **Good foam inhibition** — Contain special foam suppressant, minimizing both foaming and aeration problems.
- **Excellent antiwear properties**
- **Meets major pump manufacturer's requirements** — ISO 32, 46, and 68 meet the requirements of leading hydraulic pump manufacturers for antiwear-type hydraulic fluids in both vane- and piston-type pumps.
- **Good stability in the presence of water** by ASTM D2619 Hydrolytic Stability test and the Denison hybrid T6H20C Wet Pump test.
- **Good thermal stability** in the presence of copper and steel by the MAG Cincinnati Machine Thermal Stability, Procedure A, test.
- **Fast water separation** — Minimize rust problems by fast release of water.

FEATURES

Chevron Hydraulic Oils AW are formulated with refined paraffinic base oils. They provide excellent antiwear protection, oxidation and corrosion inhibition, as well as foam and aeration suppression. All grades have excellent demulsibility characteristics.

Hydraulic systems, due to the nature of their operation, experience accelerated wear unless they are protected by clean, high quality antiwear hydraulic oils. Surging pressures in pumps and valves can increase metal-to-metal contact unless antiwear protection is present. The antiwear additives in Chevron Hydraulic Oils AW create a protective film on the metal surfaces. This protective film minimizes metal-to-metal contact, which is most severe in vane- and gear-type pumps. As hydraulic pressures increase over 1000 psi, the need for antiwear protection increases proportionally.

APPLICATIONS

Chevron Hydraulic Oils AW are versatile lubricants available in ISO viscosity grades 32, 46 and 68.

ISO 32, 46, and 68 grades are most commonly used for hydraulics with vane-, piston-, or gear-type pumps, especially where pressures exceed 1000 psi. They can also be used to lubricate lightly loaded reciprocating compressors.

Chevron Hydraulic Oils AW – Continued

Chevron Hydraulic Oils AW **ISO 32, 46, and 68:**

- meet major pump manufacturer requirements including **Eaton-Vickers 35VQ25A** for M-2950-S (Mobile) and I-286-S (Stationary), **Parker Hannifin (Denison) HF0/HF2/T6H20C**, and **Bosch Rexroth Racine Model S**
- meet **MAG Cincinnati, Cincinnati Machine** specifications P-68 (ISO 32), P-70 (ISO 46), and P-69 (ISO 68)
- meet **DIN 51524-2**

- are registered by **NSF** and are acceptable as lubricants where there is no possibility of food contact (H2) in and around food processing areas. The NSF Nonfood Compounds Registration Program is a continuation of the USDA product approval and listing program, which is based on meeting regulatory requirements of appropriate use, ingredient review and labeling verification.

Please consult with your equipment manufacturer if equipment is operating outside normal operating conditions. Do not use in high pressure systems in the vicinity of flames, sparks and hot surfaces. Use only in well ventilated areas. Keep container closed.

TYPICAL TEST DATA

ISO Grade	68
<i>Product Number</i>	<i>255673</i>
<i>MSDS Number</i>	<i>7457</i>
API Gravity	31.6
Viscosity, Kinematic cSt at 40°C	64.6 8.4
Viscosity, Saybolt SUS at 100°F SUS	334 55
Viscosity Index	99
Flash Point, °C(°F)	235(455)
Pour Point, °C(°F)	-22(-8)
Oxidation Stability Hours to 2.0 mg KOH/g acid number, ASTM	>2000

TECHNICAL SPECIFICATIONS

I. AUTOMATIC TRANSMISSION FLUID

CHEVRON ATF MERCON® V

PRODUCT DESCRIPTION

Chevron ATF MERCON® V is for use in automatic transmissions requiring a MERCON V approved fluid.¹

CUSTOMER BENEFITS

Chevron ATF MERCON V delivers value through:

- **Protection** against the formation of lacquers, sludge, or other harmful deposits.
- **Exceptional stability** provided by excellent base oil and extra oxidation inhibitors.
- **Fast circulation during cold weather** and excellent lubricating body when hot.
- **Optimized friction characteristics** for smooth shifting and efficient power transfer.

FEATURES

Chevron ATF MERCON V is designed specifically for use in Ford Motor Company transmissions that require a MERCON V fluid. It also provides premium performance in Ford MERCON and General Motors DEXRON®-III H applications.²

It is manufactured from premium, severely hydroprocessed base stocks and select additives that provide oxidation and thermal stability, friction control, load-carrying ability, corrosion and wear protection. It helps prevent the accumulation of deposits and the formation of sludge, varnish and foam.

Compared to MERCON fluids, Chevron ATF MERCON V has exceptionally low temperature flow properties and enhanced protection against viscosity breakdown.

Under severe operating conditions, Chevron ATF MERCON V:

- Maintains friction control for smooth shift action.
- Retains low temperature fluidity and high temperature stability for long operating periods.
- Protects automatic transmission fluid coolers from corrosion.
- Helps minimize the chances of a transmission overhaul due to sludge, corrosion, wear of clutches and bands, gears and bearings, leakage past seals, and loss of frictional properties.

APPLICATIONS

Chevron ATF MERCON V is fully approved for MERCON V applications. In addition, it is recommended for applications that call for the former MERCON or DEXRON-III H fluids.

Chevron ATF MERCON V has the following qualifications:

Ford MERCON V	M5050901
Voith	G607
ZF	TE-ML 14B

Do not use in high pressure systems in the vicinity of flames, sparks and hot surfaces. Use only in well ventilated areas. Keep container closed.

Does not use in breathing air apparatus or medical equipment.

Always check your owner's manual to determine the proper automatic transmission fluid for your transmission.

Chevron ATF MERCON® V — Continued

Chevron ATF MERCON® V is not suitable for the following applications:

- Ford transmissions manufactured before 1977 and some pre-1982 transmissions require a Type F fluid such as Chevron ATF Type F.
- Vehicles with continuously variable transmissions (CVTs) require special fluids.

TYPICAL TEST DATA

<i>Product Number</i>	226719
<i>MSDS Number</i>	8061
<i>API Gravity</i>	32.5
<i>Viscosity, Kinematic cSt at 40°C cSt at 100°C</i>	37.6 8.4
<i>Viscosity, Saybolt SUS at 100°F SUS at 210°F</i>	189 54
<i>Viscosity, Brookfield cP at -40°C</i>	12,100
<i>Viscosity Index</i>	210
<i>Flash Point, °C(°F)</i>	180(356)
<i>Pour Point, °C(°F)</i>	-45(-49)
<i>Color</i>	Red

TECHNICAL SPECIFICATIONS

J. MULTI-VEHICLE AUTOMATIC TRANSMISSION FLUID

CHEVRON MULTI-VEHICLE ATF

PRODUCT DESCRIPTION

Formulated to meet the fluid needs of a broad range of automatic transmissions.

CUSTOMER BENEFITS

Chevron Multi-Vehicle ATF delivers value through:

- **Controlled inventory cost** — One ATF can be used for the vast majority of automatic transmissions on the road today and helps eliminate the need for supplemental additives or top treats which may harm the transmission.
- **Maximum equipment life** — Advanced formula protects against wear, corrosion, and the formation of lacquers, sludge, or other harmful deposits.
- **Long oil life** — Premium base oil and extra oxidation inhibitors result in maximum oil service life.
- **Smooth operation** — Carefully chosen friction modifiers allow for smooth shifting, efficient power transfer, and anti-shudder protection.

FEATURES

Chevron Multi-Vehicle ATF is an advanced technology, high performance, multipurpose power transmission fluid. In addition, it is suitable for service fill of many transmissions manufactured by North American, Asian, and European OEMs.

It is formulated with premium, severely hydro processed base stocks and carefully crafted additives that help provide oxidation and thermal stability, friction control, load-carrying ability, corrosion and wear protection. It helps protect against the formation of sludge, varnish, other harmful deposits, and foam.

Chevron Multi-Vehicle ATF has exceptional low temperature flow properties and enhanced protection against viscosity breakdown at high temperatures. It also has exceptional oxidation and thermal stability, resulting in maximum service life.

Under severe operating conditions, this fluid:

- Maintains friction control for smooth shift action and protection against shudder.
- Retains high temperature viscosity resulting in maximum oil film thickness and excellent wear protection.
- Helps minimize the chances of a transmission overhaul due to sludge, corrosion, or wear of gears, bearings, and clutches.

APPLICATIONS

Chevron Multi-Vehicle ATF is recommended for applications that call for the former DEXRON®-III, MERCON® and Allison C-4 fluids,¹ as well as for ZF and Voith requirements. This product is not licensed for MERCON V applications. If you require MERCON V licensing, please use Chevron ATF MERCON V.²

Chevron Multi-Vehicle ATF is recommended for most pre-2006 transmissions manufactured by European, Asian and North American OEMs. It is also recommended for the following applications:

- Esso Type LT 71141 ATF
- DEXRON-II and DEXRON-III
- MERCON
- Allison C-4
- Apolloil ATF Red-1K
- BMW Part #83 22 0 403 249
- Honda/Acura ATF-Z1

1 DEXRON is a registered trademark of General Motors Corporation.
MERCON is a registered trademark of Ford Motor Company.

2 Chevron Multi-Vehicle ATF does not meet the MERCON V Brookfield viscosity specification at -40°C (-40°F). Nevertheless, Chevron warrants this product for applications specifying MERCON V in accordance with the terms of Chevron's standard Limited Product Warranty. For vehicles with transmissions still under warranty, customers should be cautioned that use of non-licensed MERCON V may impact such warranty.

Chevron Multi-Vehicle ATF — Continued

- **Idemitsu K17**
- **Isuzu Genuine**
- **KIA/Mitsubishi** Diamond SP-II, SP-III
- MB 236.10
- **Nissan** Matic J, Matic K
- **Texaco** 7045-E, ETL-8072 B and N402
- **VW** Part #G 052 025
- **Volvo** Part #1161540-8
- **Toyota/Lexus** Type T, JWS 3309/Type T-IV

Chevron Multi-Vehicle ATF has the following qualifications:

Voith	H55.6335.xx
ZF	TE-ML 03D, 04D, 14B, 16L, 17C

Chevron Multi-Vehicle ATF has passed the JASO 1A standard tests for performance in Japanese vehicles. The product will deliver the shifting performance and exceptional anti-shudder durability which is desired by Japanese and Korean automakers.

Always check your owner's manual to determine the proper automatic transmission fluid for your vehicle.

Chevron Multi-Vehicle ATF is not suitable for a limited number of special applications, such as:

- Ford transmissions manufactured before 1977 and some pre-1982 transmissions require a Type F fluid such as Chevron ATF Type F (no friction modifier).
- Vehicles with continuously variable transmissions (CVTs) require special fluids.

CONSUMER ADVISORY CONCERNING ATF SUPPLEMENTS

Multi-Vehicle ATF supports OEM service drain intervals with premium automatic transmission protection. Some automotive service providers use a combination of a regular DEXRON®-III-type ATF, such as Chevron ATF MD-3, plus a supplement or top-treat mixed in. This practice can compromise the protection of an automatic transmission, for example:

- Car manufacturers warn against the use of supplements.
- ATF supplements can lead to accelerated gear wear.
- ATF supplements or top-treats can promote corrosion of transmission bearings.

- ATF supplements or top-treats can adversely affect cold temperature start-up performance.
- Smooth shifting becomes rough much sooner with top-treats in standard testing versus Multi-Vehicle ATF.

Supplements or top-treat technologies provide a temporary benefit and then can often fall short in product performance prior to the next change interval. Top-treat technologies may not provide sustainable ATF performance and protection, specifically in anti-shudder durability performance, corrosion protection, cold temperature start-up protection and gear wear protection compared to Multi-Vehicle ATF. To find an ATF that meets your vehicle requirements, consult your owner's manual and avoid top-treats and supplements.

TYPICAL TEST DATA

<i>Product Number</i>	226531
<i>MSDS Number</i>	13641
<i>API Gravity</i>	32.6
<i>Viscosity, Kinematic cSt at 40°C</i>	36.6 7.3
<i>Viscosity, Brookfield cP at -40°C, (-40°F)</i>	18,400
<i>Viscosity Index</i>	169
<i>Flash Point, °C(°F)</i>	198(388)
<i>Pour Point, °C(°F)</i>	-53(-63)
<i>Color</i>	Red

Minor variations in product typical test data are to be expected in normal manufacturing.

TECHNICAL SPECIFICATIONS

K. SYNTHETIC AUTOMATIC TRANSMISSION FLUID HEAVY DUTY

CHEVRON SYNTHETIC AUTOMATIC TRANSMISSION FLUID HEAVY DUTY

PRODUCT DESCRIPTION

Chevron Synthetic Automatic Transmission Fluid Heavy Duty is specially engineered for heavy duty automatic truck and bus transmissions operating in extended service. It is officially approved by Voith and ZF for extended drain intervals and Allison TES-389 transmission warranty service.

CUSTOMER BENEFITS

Chevron Synthetic Automatic Transmission Fluid Heavy Duty delivers value through:

- **Extended drains** of up to six times that of a conventional automatic transmission fluid.
- **Protection** against the formation of lacquers, sludge, or other harmful deposits.
- **Exceptional stability** provided by excellent base oil and extra oxidation inhibitors.
- **Fast circulation during cold weather** and excellent lubricating qualities when hot.
- **Optimized friction characteristics** for smooth shifting and efficient power transfer.

FEATURES

Chevron Synthetic Automatic Transmission Fluid Heavy Duty is designed for severe duty and extended drain intervals. It is recommended for any application that calls for the Allison TES-295 performance level. It has been field tested in several urban transit fleets with excellent results for drain intervals ranging from 50,000 to 100,000 miles.

It is manufactured from synthetic base oils and additives that help provide oxidation and thermal stability, friction control, load-carrying ability, corrosion and wear protection. It helps prevent the accumulation of deposits and the formation of sludge, varnish, and foam.

Chevron Synthetic Automatic Transmission Fluid Heavy Duty has excellent low temperature flow properties and enhanced protection against viscosity breakdown.

Under the most severe operating conditions, this fluid:

- maintains friction control for smooth shift action
- retains low temperature fluidity and high temperature stability for long operating periods.
- provides excellent antiwear protection.
- greatly extends the time to transmission overhauls due to sludge, corrosion, wear of clutches and bands, gears and bearings, leakage past seals, and loss of frictional properties compared to a conventional automatic transmission fluid.

APPLICATIONS

Chevron Synthetic Automatic Transmission Fluid Heavy Duty is specially engineered for heavy duty automatic truck and bus transmissions operating in extended service. It is officially approved by Voith and ZF for extended drain intervals.

It is approved for Allison TES-389 transmission warranty service.

It is not approved by Allison for TES-295 transmission extended warranty service.

It is also an excellent choice for passenger cars and light trucks requiring Ford MERCON®, MERCON V, or General Motors DEXRON®-III,¹ especially for those vehicles in moderate to severe service. Examples of severe service applications include police cars, taxicabs, pickup & delivery trucks, recreational vehicles, and tow trucks.

Chevron Synthetic Automatic Transmission Fluid Heavy Duty — Continued

Chevron Synthetic Automatic Transmission Fluid Heavy Duty

has the following qualifications:

Allison C-4	C4-31662005
Allison TES-389	AA-31992007
MAN 339	V-2, Z-2
Voith	H55.6336.3X
ZF	TE-ML 14B

Chevron Synthetic Automatic Transmission Fluid Heavy Duty has previously received the following qualifications:

Ford MERCON V	M5061001
General Motors DEXRON-III	H-36048

Do not use in high pressure systems in the vicinity of flames, sparks and hot surfaces. Use only in well ventilated areas. Keep container closed.

Do not use in breathing air apparatus or medical equipment.

TYPICAL TEST DATA

<i>Product Number</i>	226718
<i>MSDS Number</i>	8026
API Gravity	35.2
Viscosity, Kinematic cSt at 40°C	35.3 7.4
Viscosity, Saybolt SUS at 100°F SUS	179 51
Viscosity, Brookfield cP at	11,400
Viscosity Index	183
Flash Point, °C(°F)	216(421)
Pour Point, °C(°F)	-49(-56)
Color	Red
FZG Gear Wear Test, Failure Load	12

TECHNICAL SPECIFICATION

L. CHAIN BAR OIL ISO 150

CHEVRON RED CHAIN BAR OILS

ISO 68, 100, 150, 220

PRODUCT DESCRIPTION

Chevron Red Chain Bar Oils are designed for use in chain saws.

CUSTOMER BENEFITS

Chevron Red Chain Bar Oils deliver value through:

- **Minimal wear** — Helps minimize wear for the chain, bar, and sprocket.
- **Tackiness** — The increased tackiness additive helps keep the oil on the chain and helps prevent sling-off when the chain is traveling at high speeds resulting in minimal waste and consumption
- **Field experience** — Used extensively in the field with proven experience.

FEATURES

Chevron Red Chain Bar Oils are very tacky, tough, lubricants made from special high viscosity base oils having the desired flow and pump ability properties to help assure adequate lubrication over a wide range of ambient temperatures.

Chevron Red Chain Bar Oils are manufactured to meet the needs of the forest products industry under adverse operating conditions.

To a logger, chainsaw lubrication is one of the most demanding requirements for efficient chainsaw performance and operation. Chevron Red Chain Bar Oils were designed to meet this demand with economy in mind.

There are four grades of Chevron Red Chain Bar Oils to meet any ambient temperature requirements.

ISO 68 is recommended for winter conditions when temperatures are consistently below 0°C (32°F).

ISO 100 is the ideal grade for cool weather conditions of 0-15°C (32-60°F) to help assure a proper flow from either hand operated or automatic chain oilers.

ISO 150 is a good choice for all-season use in mild climates and provides excellent wear protection under hot weather operating conditions.

ISO 220 is often preferred by forest industry professionals during the summer season due to its outstanding lubricating and film retention properties. The higher viscosity of the ISO 220 grade, in combination with wear protection additives, helps provide the extra level of protection needed in high performance professional saws.

APPLICATIONS

Chevron Red Chain Bar Oils are recommended for use in chain saws using either hand-operated or automatic chain oilers to lubricate the chain, bar, and sprocket.

Chevron Red Chain Bar Oils — Continued

TYPICAL TEST DATA

ISO Grade	150
<i>Product Number</i>	<i>225109</i>
<i>MSDS Number</i>	<i>6804</i>
API Gravity	25.5
Viscosity, Kinematic cSt	143
Viscosity, Saybolt SUS at 100°F	750
Flash Point, °C(°F)	218(424)
Pour Point, °C(°F)	-24(-11)

TECHNICAL SPECIFICATION

M: TRACTOR HYDRAULIC FLUID

CHEVRON 1000 THF

PRODUCT DESCRIPTION

Chevron 1000 THF is a high quality, multifunctional tractor hydraulic fluid, specially formulated for use in transmissions, final drives, wet brakes, and hydraulic systems of tractors and other equipment employing a common fluid reservoir.

CUSTOMER BENEFITS

Chevron 1000 THF delivers value through:

- **Low operating costs** — By meeting or exceeding the performance of fluids supplied by equipment manufacturers, helps in avoiding the cost of generally more expensive fluids and thereby minimizes overall operating costs.
- **Long equipment life** — Special additives protect metal surfaces against scuffing and wear even under severe operating conditions leading to maximum equipment life.
- **Low inventory cost** — One fluid does the job of a full range of mobile hydraulic systems. Can replace multiple products and free up shelf space too!
- **Minimizing weather and storage concerns** — Protects against rust and corrosion of highly finished precision parts when operating in humid conditions and during seasonal shutdown periods.
- **Minimal downtime** — Good compatibility with seals, O-rings, and packing materials maintains their good condition and keeps leakage at a minimum.
- **Smooth operation** — Formulated to suppress brake "chatter" and transmission "slip" for quiet and efficient action of brakes and transmission.
- **Reliable operation** — Formulation helps keep metal parts clean and free of varnish and sludge deposits that could result in premature breakdown.
- **Fast service time** — Orange color helps identify origin point of incidental leaks for easy detection and quick remedy.

FEATURES

Chevron 1000 THF is a high quality, multifunctional tractor hydraulic fluid, specially formulated for use in transmissions, final drives, wet brakes, and hydraulic systems of tractors and other equipment employing a common fluid reservoir.

It is formulated with highly refined base stocks, a viscosity index improver, oxidation and corrosion inhibitors, antiwear and film strength additives, an antifoaming agent, and a pour point depressant.

Its distinctive orange color allows for easy product identification and leak detection.

Chevron 1000 THF meets the needs of modern tractors for a multi-functional lubricant. It is designed for many uses, such as lubrication of the transmission and final drive, and serves as a hydraulic fluid to operate power steering units, brakes, implements, and attachments.

Chevron 1000 THF is formulated to suppress brake "chatter" and excessive brake facing wear. It offers smooth operation of clutch packs and wet brakes, provides excellent shifting action, provides exceptional rust and corrosion protection for vital parts, and minimizes leakage because of good compatibility with seals, O-rings, and packing materials.

It helps prevent sludge and varnish formation, protects metal surfaces against scuffing and wear, and provides outstanding lubrication for spur, helical, and spiral bevel final drive gears.

Chevron 1000 THF is compatible with equipment manufacturer's proprietary fluids and other fluids of this type.

APPLICATIONS

Chevron 1000 THF is recommended for use:

- as a multifunctional fluid in many types of farm tractors and equipment.
- in applications which call for the following OEM lubricant specifications:
 - **AGCO** — improved power fluid 821XL
 - **John Deere** — J20C
 - **Ford New Holland** — ESN-M2C134-D, FNHA 2 C 201
 - **Massey Ferguson** — M1135, M1141, M1143
 - **White Farm Equipment** — Q-1826
 - **Case Corporation** — JIC-143, JIC-145, MS 1206, MS 1207, MS 1209, MS 1210(TCH)
 - **Oliver** — Q-1705
 - **Minneapolis-Moline** — Q-1766, Q1722, Q-1766B
 - **Caterpillar** TO-2
 - **Renk Doromat** — 874A and 874B
 - **Kubota** UDT
 - **International Harvester** B6
 - **Volvo** WB 101

Chevron 1000 THF is also an excellent hydraulic fluid for many types of hydraulic systems requiring an anti-wear hydraulic fluid in this viscosity range. It passes the High Pressure Vane Pump Test, ASTM D2882, with less than 15 mg steel weight loss.

TYPICAL TEST DATA

<i>Product Number</i>	226606
<i>MSDS Number</i>	7648
<i>API Gravity</i>	29.9
<i>Viscosity, Kinematic cSt at 40°C</i>	58.4 9.5
<i>Viscosity, Saybolt SUS at 100°F SUS</i>	298 58.3
<i>Viscosity, Brookfield cP at</i>	40,000
<i>Viscosity Index</i>	145
<i>Flash Point, °C(°F)</i>	235(455)
<i>Pour Point, °C(°F)</i>	-42(-44)
<i>Color</i>	Orange

Minor variations in product typical test data are to be expected in normal manufacturing.

Do not use in high pressure systems in the vicinity of flames, sparks and hot surfaces. Use only in well ventilated areas. Keep container closed.

TECHNICAL SPECIFICATION

N: DIESEL EXHAUST FLUID (DEF)

Required for diesel vehicles equipped with a selective catalytic reduction (SCR) emissions after treatment system.

Reduces NOx emissions in diesel vehicles with an SCR catalyst.

AUS32 fluid meeting all the requirements and purity standards of ISO 22241 and DIN70070.

Filler Nozzle provided with 2.5 gallon container. Nozzle specifically designed to fit the DEF filler opening of 2011MY Ford diesel vehicles (as well as many competitive vehicles) and prevent over filling the DEF tank.

(Ultra Pure 32.5% Urea Solution) *

Meets the specifications of ISO 22241-1:2006 and DIN 70070 used for NOx reduction in diesel engine exhaust systems.

TYPICAL PROPERTIES

Urea (wt %)	31.8 – 33.2	% by weight
Alkalinity as NH ₃	max 0.2	% by weight
Biuret	max 0.3	%
Insoluble	max 20	ppm
Aldehydes	max 5	ppm
Phosphate (PO ₄)	max 0.5	ppm
Aluminum	max 0.5	ppm
Calcium	max 0.5	ppm
Copper	max 0.2	ppm
Iron	max 0.5	ppm
Zinc	max 0.2	ppm
Chromium	max 0.2	ppm
Nickel	max 0.2	ppm
Magnesium	max 0.5	ppm
Sodium	max 0.5	ppm
Potassium	max 0.5	ppm
Density at 68° F (20°C)	9.07 – 9.12	lbs/gal
Refractive Index at 68° F (20°C)	1.3814 – 1.3843	
Salt-Out Temperature	12 (-11)	F (°C)
Recommended Storage Temp.	40 -80 (4.5 – 26.6)	F (°C)

TECHNICAL SPECIFICATION

O. SPILLAGE:

All spillages must be corrected on an immediate basis to the satisfaction of the ordering agency. All associated cost including materials and labor shall be borne by the vendor. Damage resulting from a spillage shall be the responsibility of the vendor. The vendor shall immediately notify the below listed office of all spillages:

Florida Department of Transportation
Mickey Harrison, District One Fleet Manager
Office Phone No.: (863) 519-2321