ADCO LUBE

ADCO LUBES

In close collaboration with our customers, we develop oils for use in a number of applications that fill important roles in their products and processes. Long-lasting oils that create sustainable value.

ADCO Lubricant Product Guide contains information on the full range of products produced by ADCO Lube. Our comprehensive product range includes automotive, industrial, marine, grease and other products developed to meet the latest industry standards and applications. Designed to provide essential information in an easily accessible format, the Product Guide is divided into eight sections. Each section includes ADCO lube products grouped under generic categories such as Gasoline Engine Oils, Diesel Engine Oils, Gearbox and Transmission Oils, Industrial Oils, Marine Oils, Greases and Specialty Products. The last section provides technical information, tables and charts. Sections are marked by a pictogram and color coded for easy reference.

Products are listed on individual pages in each section and relevant information for each product is provided under the headlines: description, typical characteristics, applications, benefits and performance.

ADCO Lube products are developed to ensure the highest standards of quality commensurate with respective performance levels and applications. In this Product Guide, the word ADCO lube and the name of the product is used in a collective sense to refer to products registered under the trademark ADCO LUBE, which is an internationally registered trademark and can only be used under a license from the owner of the trademark ADCO LUBE FZC.

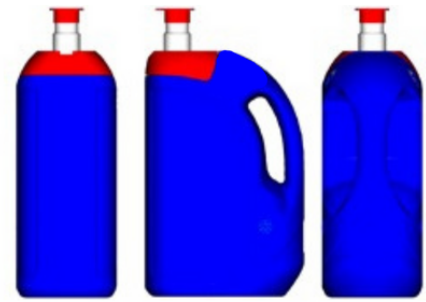
NOTE:
The Physical & Chemical Properties included in this handbook are typical values of current production. Minor variations are the norm in the manufacturing process and does not affect product performance.

SMART PACK - 4L

diesel and petrol

SMART PACK - 4L

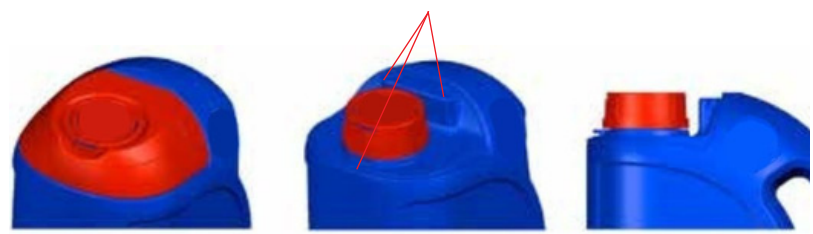
With Pull-up shroud for easy pouring



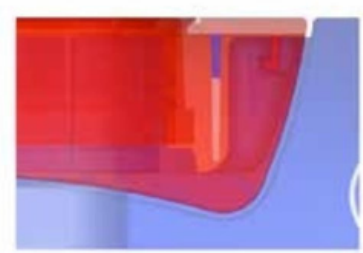
SMART PACK

Clip-on shroud

View of showing shroud attachment points



Detail: Shroud attachment to bottle



Clip-on shroud with re-enforced wall to prevent load distortion

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ADCO LUBRICANTS

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PASSENGER CARS AND LIGHT TRUCKS

ADCO GOLD
5W/30, 5W/40

DESCRIPTION

ADCO GOLD is a top-tier, environment friendly, synthetic engine oil designed to provide maximum engine protection for all passenger cars, racing cars, vans, light trucks and 4WD recreational vehicles with exhaust treatment.
ADCO GOLD is suitable for high performance engines, especially those fitted with turbo chargers and superchargers, operating under the most severe conditions.
ADCO GOLD is formulated with fully synthetic high quality base oil in combination with innovative additive technology to provide outstanding characteristics and properties.

APPLICATIONS

ADCO GOLD is a top-tier motor oil designed to lubricate both gasoline and diesel fueled passenger cars, racing cars, vans, light trucks and 4WD recreational vehicles with exhaust treatment.

BENEFITS

Longer oil life and lower oil consumption with outstanding protection against wear, rust, corrosion, soot handling and exceptional engine cleanliness.
• Exceptional thermal stability and oxidation resistance.
• Outstanding low temperature fluidity, excellent shear stability and stable viscosity during operation.
• Strong oil film stops metal to metal contact.
• Superior protection of exhaust emission control system.
• Multi-viscosity characteristic ensure rapid oil circulation on start-up the engine.

PERFORMANCE LEVEL

API ..... SN/CF
ACEA A5/B5/04,C3/08
MB.....229.51
VW ..... 502 00, 505 00 ,505 01
BMW.....LL 04
PORSCHE ..... A 40

Meets quality requirements of most gasoline engine manufacturers in the USA, Europe, Japan and Korea.

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE		TEST METHOD
Grade		-	5W/30	5W/40	-
Specific Gravity	@ 15°C	-	0.8554	0.8560	ASTM D-1298
Viscosity	@ 40°C	mm2/s	61.00	81.00	ASTM D-445
	@ 100°C	mm2/s	11.00	13.75	ASTM D-445
Viscosity Index		-	175	175	ASTM D-2270
Flash Point	COC	°C	230	230	ASTM D-92
Pour Point		°C	-39	-39	ASTM D-97
Base Number		mg KOH/g	8.5	8.5	ASTM D-2896
Color		-	3	3	ASTM D-1500
CCS Vis	@ -30°C	cP	6000	6000	ASTM D-5293

ADCO SILVER 10W/40

DESCRIPTION

ADCO SILVER is a high quality Semi-Synthetic multi-grade and multipurpose gasoline engine oil. ADCO Silver is blended from high quality Semi-Synthetic base oil with the most advanced additive package which enables it to give exceptional performance under the most severe operating conditions. ADCO SILVER is developed for gasoline and diesel car engines while meeting and complying with the requirements of the latest direct injection engines and conventional engines as well.

APPLICATIONS

ADCO SILVER is recommended for gasoline and diesel engine passenger cars, vans, light trucks, turbo charged or naturally aspirated. ADCO SILVER is suitable and exceeds the performance requirements of most European, Japanese and American car manufacturers.

BENEFITS

- High and constant quality by excellent detergent properties giving greater engine cleanliness for enhanced performance.
- High Viscosity Index and excellent shear stability results in stable viscosity during operation.
- Less oil top-up.
- Superior anti-wear properties protect the engine's most sensitive parts.
- Easy cold start and ideal lubrication at elevated temperatures ensures low oil consumption and cold start protection against wear.

PERFORMANCE LEVEL

API ..... SL/CF
ACEA A3/B4/08
MB..... 229.1
VW 501. 01, 505 00

Meets quality requirements of most gasoline and diesel passenger car manufacturers in the USA, Europe, Japan and Korea.

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE	TEST METHOD
Grade		-	10W/40	-
Specific Gravity	@ 15°C	-	0.8685	ASTM D-1298
Viscosity	@ 40°C	mm2/s	93.30	ASTM D-445
	@ 100°C	mm2/s	13.80	ASTM D-445
Viscosity Index		-	150	ASTM D-2270
Flash Point	COC	°C	230	ASTM D-92
Pour Point		°C	-30	ASTM D-97
Base Number		mg KOH/g	8.0	ASTM D-2896
Color		-	L3.5	ASTM D-1500
CCS Vis	@ -25°C	cP	6500	ASTM D-5293

ADCO BRONZE 20W/50

DESCRIPTION

ADCO BRONZE is blended with the most advanced additive package, which enables it to give exceptional performance under the most severe operating conditions. It provides effective protection against oxidation, wear and corrosion under high temperature operations and remains a stable multi-grade product. ADCO BRONZE provides high resistance to sludge, low volatility characteristics and low oil consumption.

APPLICATIONS

ADCO BRONZE is recommended for gasoline and diesel engine passenger cars, vans, light trucks of every make and type, turbo charged or naturally aspirated. ADCO BRONZE is suitable and exceeds the performance requirements of most European, Japanese and American car manufacturers.

BENEFITS

- Excellent engine protection.
- Eliminates seasonal oil changes.
- Maintains a high order of engine cleanliness.
- Excellent control of deposit formation.
- Excellent oxidation stability at high temperature.
- Excellent shear stability, maintains viscosity grade.
- Protects against rust, wear and sludge formation.
- Less oil top-up.

PERFORMANCE LEVEL

API .....SL/CF
ACEA A3/B3/04
MB 229.1
VW 505 00

Meets the quality requirements of major gasoline engine manufacturers in the USA, Europe and Japan.

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE	TEST METHOD
Grade		-	20W/50	-
Specific Gravity	@ 15°C	-	0.8926	ASTM D-1298
Viscosity	@ 40°C	mm2/s	151.10	ASTM D-445
	@ 100°C	mm2/s	17.75	ASTM D-445
Viscosity Index		-	130	ASTM D-2270
Flash Point	COC	°C	240	ASTM D-92
Pour Point		°C	-27	ASTM D-97
Base Number		mg KOH/g	8	ASTM D-2896
Color		-	Green	VISUAL
CCS Vis.	@ -15°C	cP	8500	ASTM D-5293

ADCO SJ 20W/50, 40

DESCRIPTION

ADCO SJ is a high quality gasoline engine oil for use in passenger cars and light trucks. It is formulated from selected base oils and special chemical additives which provide oxidation stability and high detergent & dispersant characteristics.

APPLICATIONS

ADCO SJ is recommended for supercharged or naturally aspirated gasoline engines, in passenger cars and light trucks requiring the manufacturer's recommended API service category SJ. It can also be used where lower API level oils are recommended.

BENEFITS

- High oxidation stability.
- Protects against wear, rust, corrosion and sludge formation.
- Minimize deposit formation at high temperatures.

PERFORMANCE LEVEL

API .....SJ/CF

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE		TEST METHOD
Grade		-	20W/50	40	-
Specific Gravity	@ 15°C	-	0.8900	0.8850	ASTM D-1298
Viscosity	@ 40°C	mm2/s	162.3	135.0	ASTM D-445
	@ 100°C	mm2/s	17.75	13.75	ASTM D-445
Viscosity Index		-	120	97	ASTM D-2270
Flash Point	COC	°C	240	250	ASTM D-92
Pour Point		°C	-27	-15	ASTM D-97
Base Number		mg KOH/g	6	6	ASTM D-2896
Color		-	Red	L3.0	VISUAL/ASTM D-1500
CCS Vis	@ -15°C	cP	8500	-	ASTM D-5293

ADCO

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HEAVY DUTY DIESEL LUBRICANTS

ADCO ULTRA SYN 10W/40

DESCRIPTION

ADCO ULTRA SYN is fully synthetic ultra high performance diesel engine oil designed to meet the most severe performance requirements of the latest high output. It is recommended for low emission European Euro 4 and Euro 5 specification. ADCO ULTRA SYN is a low Sulphated Ash and Phosphorus (SAP) engine oil formulated to meet reduced SAP levels required to protect and extend the life of the exhaust emission control system. It is designed for use in the most severe diesel engines.

APPLICATIONS

- It is designed for use in the most severe diesel engine applications of high speed, high load conditions, off or on highway applications.
- Naturally aspirated and turbocharged high speed and four-stroke diesel engines.
- It is designed to meet the highest quality levels required by major diesel engine manufacturers like Daimler Chrysler, MAN, Mack, Volvo, Cummins, Caterpillar and others.
- Diesel engines equipped with aftertreatment system.

BENEFITS

- Outstanding deposit control under high temperature conditions encountered in turbocharged engines.
- Effective detergent additive system minimizes piston crown land deposits.
- Reduces wear by forming an interface layer on all metals contact surfaces.
- Extend drain periods due to high temperature stability, minimizing degradation, sludge formation and oil thickening.
- Fuel economy due to superior synthetic base stocks.
- Shear-stable Viscosity Index Improver maintains oil viscosity in the high temperature ring belt area.
- Low volatility of synthetic fluids reduces oil evaporation.
- Superior protection of exhaust emission control system.

PERFORMANCE LEVEL

API CI4/SL
ACEA E6/E7/E9/08
MB 228.51
MAN 3477
VOLVO.....VDS3

MACK.....EO-M Plus
MTU.....TYPE 3.1
Renault.....RGD,RXD
Deutz DQC.....111-05
CAT.....ECF 1-a

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE	TEST METHOD
Grade		-	10W/40	-
Specific Gravity	@ 15°C	-	0.8700	ASTM D-1298
Viscosity	@ 40°C	mm2/s	93.20	ASTM D-445
	@ 100°C	mm2/s	13.75	ASTM D-445
Viscosity Index		-	150	ASTM D-2270
Flash Point	COC	°C	230	ASTM D-92
Pour Point		°C	-30	ASTM D-97
Base Number		mg KOH/g	10	ASTM D-2896
Color		-	3	ASTM D-1500
CCS Vis	@ -25°C	cP	6500	ASTM D-5293

ADCO ULTRA 15W/40

DESCRIPTION

ADCO ULTRA is an ultra high performance diesel engine oil designed to meet the most severe performance requirements of the latest high output. Low emission lubricants are required for Environment Protection Agency (EPA) regulation compliant diesel engine equipped with aftertreatment devices such as diesel oxidation catalysts and particulate filters.

APPLICATIONS

VOYAGE ULTRA exceeds all the performance criteria for the new CJ4 service category for heavy duty diesel engine oil recommended for.

- Naturally aspirated and turbocharged high speed, four stroke diesel engine.
- Stop and go vehicles in high soot loading services.
- New diesel engines with exhaust emission control systems.
- Older on-highway diesel engines requiring improved protection.
- Ideal for mixed fleet including gasoline applications.
- Off or on-highway vehicles.

BENEFITS

- Exceptional oxidation stability at high temperature and soot control minimizes degradation sludge formation and oil thickening consequently resulting in longer drain intervals.
- Multipurpose oil for both old and new engines including engines equipped with aftertreatment devices such as diesel oxidation catalysts and particulate filters.
- Shear-stable Viscosity Index Improver prevents oil flow through the piston rings by maintaining oil viscosity in the high temperature ring belt area, while special low volatility reduces oil evaporation.
- Good dispersion to avoid oil thickening and abrasive polishing wear.

PERFORMANCE LEVEL

API CJ-4/CI-4 PLUS/CI-4/SM
ACEA E9/08
MB 228.31
MAN 3275
VOLVO.....VDS4

MACK..... EO-O Premium Plus
MTU..... TYPE 2
CUMMINS..... 20081
CAT..... ECF-1-a
Detroit Diesel..... DDC 93K218

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE	TEST METHOD
Grade		-	5W/30	-
Specific Gravity	@ 15°C	-	0.8554	ASTM D-1298
Viscosity	@ 40°C	mm2/s	61.00	ASTM D-445
	@ 100°C	mm2/s	11.00	ASTM D-445
Viscosity Index		-	175	ASTM D-2270
Flash Point	COC	°C	230	ASTM D-92
Pour Point		°C	-39	ASTM D-97
Base Number		mg KOH/g	8.5	ASTM D-2896
Color		-	3	ASTM D-1500
CCS Vis	@ -20°C	cP	6000	ASTM D-5293

ADCO PLUS
15W/40, 20W/50, 40, 50

DESCRIPTION

ADCO PLUS is a premium high quality engine oil. It is an ideal mixed fleet engine oil. It is also suitable for many brands of diesel engines, either made in America, Europe, Japan or other Asian countries because it has global performance level DH D-1. The additive used in blending ADCO PLUS has proven its high performance in the field.

APPLICATIONS

ADCO PLUS is designed for use in the most severe diesel engines. It is used in high speed, high load conditions, off highway and on-highway vehicles. It is recommended for most types of diesel engines, whether naturally aspirated super charged or turbo-charged.
ADCO PLUS is a universal engine oil that can be used in mixed fleet applications since it meets the high performance specification for gasoline engines and also for light duty diesel cars, vans and buses.

BENEFITS

- Very good oxidation stability and soot handling capability so it has longer drain interval.
- Very good capability in preventing wear at valve train, piston ring and liner caused by high soot content and corrosion.
- Very good detergency and dispersancy ability to prevent the formation for deposit and sludge in the engine.
- Optimal viscosity either at high or low oil operation temperatures.
- Mixed fleet engine oil for American, European and Japanese vehicles.
- Universal engine oil for both old and new diesel engine.
- Excellent shear stability.

PERFORMANCE LEVEL

API CI4/SL
GLOBAL.....DHD-1
ACEA E7/A3/B4/04
MB 228.3
MAN 3275
VOLVO.....VDS3
MACK.....EO-M Plus
MTU.....TYPE 2
CUMMINS.....20072/1/6/7/8
RVI.....RLD/RLD2
CAT.....ECF 1

N OT E:
Due to some licensing and approval rules and regulations set by API & OEM's above performance levels may not apply to all SAE viscosity grades although they have the same additive treat rates. For more details please contact ADCO Lube Technical Services.

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE				TEST METHOD
Grade		-	15W/40	20W/50	40	50	-
Specific Gravity	@ 15°C	-	0.8800	0.8890	0.8850	0.9010	ASTM D-1298
Viscosity	@ 40°C	mm2/s	99.00	150.5	134.5	198.0	ASTM D-445
	@ 100°C	mm2/s	13.75	17.75	13.75	17.75	ASTM D-445
Viscosity Index		-	140	130	98	98	ASTM D-2270
Flash Point	COC	°C	230	240	250	260	ASTM D-92
Pour Point		°C	-27	-27	-15	-9	ASTM D-97
Base Number		mg KOH/g	10	10	10	10	ASTM D-2896
Color		-	3.0	3.0	3.0	3.5	ASTM D-1500
CCS Vis		cP	6500	8500	-	-	ASTM D-5293
		°C	@ -20	@-15	-	-	

ADCO HPSD PLUS 15W/40, 20W/50

DESCRIPTION

ADCO HPSD PLUS is a premium quality, heavy duty diesel engine oil designed for the high performance requirement of modern, highly rated turbocharged diesel engines in road transport and off-highway operations.

APPLICATIONS

ADCO HPSD PLUS is suitable for use in a variety of highly rated turbocharged and naturally aspirated high speed diesel engines. It can also be used for some types of gasoline engines, making it ideal for mixed fleet operations. It can be used as C4 transmission fluid in Allison transmissions and in Caterpillar transmissions.

BENEFITS

- Extended oil drain period.
- Large reduction in bore polishing.
- Maintains excellent engine cleanliness.
- Increases engine protection and hence longer engine life.
- Maximum control of piston deposits and ring sticking.
- Excellent shear stability.

PERFORMANCE LEVEL

API CH-4/SJ
ACEA A2/B3/E2/04
MB 228.3
MAN 271
VOLVO.....VDS
MACK.....EO-L Plus
MTU.....TYPE 1
VW.....50100 505 00

NOTE:
Due to some licensing and approval rules and regulations set by API & OEM's above performance levels may not apply to All SAE viscosity grades although they have the same additive treat rates. For more details please contact ADCO Lube Technical Services.

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE		TEST METHOD
Grade		-	15W/40	20W/50	-
Specific Gravity	@ 15°C	-	0.8810	0.8925	ASTM D-1298
Viscosity	@ 40°C	mm2/s	99.10	150.5	ASTM D-445
	@ 100°C	mm2/s	13.75	17.75	ASTM D-445
Viscosity Index		-	140	130	ASTM D-2270
Flash Point	COC	°C	230	240	ASTM D-92
Pour Point		°C	-27	-27	ASTM D-97
Base Number		mg KOH/g	10	10	ASTM D-2896
Color		-	3.0	3.0	ASTM D-1500
CCS Vis		cP	6500	8500	ASTM D-5293
		°C	@-20	@-15	

ADCO HPSD
15W/40, 20W/50, 10W, 30, 40, 50

DESCRIPTION

ADCO HPSD is a premium quality, heavy duty diesel engine oil designed for the high performance requirement of modern, highly rated turbocharged diesel engines in road transport and off-highway operations.

APPLICATIONS

ADCO HPSD is suitable for use in a variety of highly rated turbocharged and naturally aspirated high speed diesel engines. It can also be used for some types of gasoline engines, making it ideal for mixed fleet operations. It can be used as C4 transmission fluid in Allison transmissions and in Caterpillar transmissions.

BENEFITS

- Extended oil drain period.
- Large reduction in bore polishing.
- Maintains excellent engine cleanliness.
- Increases engine protection and hence longer engine life.
- Maximum control of piston deposits and ring sticking.
- Excellent shear stability.

PERFORMANCE LEVEL

API CG-4/SJ
ACEA A2/B3/E2/04
MB 228.3
MAN 271
VOLVO.....VDS
MACK.....EO-L Plus
MTU.....TYPE 1
VW.....50100 505 00

NOTE:
Due to some licensing and approval rules and regulations set by API & OEM's above performance levels may not apply to All SAE viscosity grades although they have the same additive treat rates. For more details please contact ADCO Lube Technical Services.

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE					TEST METHOD
Grade		-	15W/40	20W/50	30	40	50	-
Specific Gravity	@ 15°C	-	0.8810	0.8925	0.8800	0.8850	0.8995	ASTM D-1298
Viscosity	@ 40°C	mm2/s	99.10	150.5	98.00	134.4	196.5	ASTM D-445
	@ 100°C	mm2/s	13.75	17.75	11.00	13.75	17.75	ASTM D-445
Viscosity Index		-	140	130	98	98	98	ASTM D-2270
Flash Point	COC	°C	230	240	235	250	260	ASTM D-92
Pour Point		°C	-27	-27	-18	-15	-9	ASTM D-97
Base Number		mg KOH/g	10	10	10	10	10	ASTM D-2896
Color		-	3.0	3.0	3.0	3.0	L3.5	ASTM D-1500
CCS Vis		cP	6500	8500	-	-	-	ASTM D-5293
		°C	@-20	@-15	-	-	-	

ADCO UNIVERSAL S3+ 10W, 30, 40, 50

DESCRIPTION

ADCO UNIVERSAL S3+ is premium quality engine oil suitable for wide variety of engines including super charged diesel engines. It is also suitable for Detroit two-stroke GM engines with an ash content less than 1%wt. ADCO UNIVERSAL is formulated from high quality base stocks and specially selected additive package.

APPLICATIONS

ADCO UNIVERSAL S3+ is recommended for a wide variety of diesel engines including super charged, Detroit two-stroke GM, heavy duty machineries, stationary engines, transport and agriculture equipment.

BENEFITS

- Reduces bore polishing.
- Excellent protection against wear.
- Improved resistance to ring sticking, ring and cylinder wear.
- Liner wear, valve and combustion deposits.

PERFORMANCE LEVEL

API CF/CF-2

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS				TEST METHOD
Grade		-	30	40	50	-
Specific Gravity	@ 15°C	-	0.8957	0.8990	0.9020	ASTM D-1298
Viscosity	@ 40°C	mm2/s	97.00	134.2	198.0	ASTM D-445
	@ 100°C	mm2/s	11.00	13.75	17.75	ASTM D-445
Viscosity Index		-	98	98	97	ASTM D-2270
Flash Point	COC	°C	235	250	260	ASTM D-92
Pour Point		°C	-18	-15	-9	ASTM D-97
Base Number		mg KOH/g	8	8	8	ASTM D-2896
Color		-	2.5	L3.0	3.0	ASTM D-1500
CCS Vis	@ -25°C	cP	-	-	-	ASTM D-5293
		°C	@-15	@-25	-	

ADCO UNIVERSAL S3 415

DESCRIPTION

ADCO UNIVERSAL S3 415 is 15 TBN oil. It is a high performance diesel engine oil of CF quality for use in engines operating on relatively high sulphur fuels. It is formulated from high quality base oils and additives. It is high alkaline-reserve oil suitable for medium and high-speed diesel engines using high sulphur distillate fuels.

APPLICATIONS

ADCO UNIVERSAL S3 415 is recommended for use in high-output diesel engines where service factors require this quality of oil. It is suitable for Caterpillar pre-combustion type engines and other diesel engines using high sulphur fuel.

BENEFITS

- Excellent protection against corrosive wear in severe diesel
- service.
- Minimize rust and corrosion.
  Good detergent and dispersant
- properties.
  Contain high alkalinity reserve.

PERFORMANCE LEVEL

API .....CF

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE	TEST METHOD
Grade		-	S3 415	-
Specific Gravity	@ 15°C	-	0.8986	ASTM D-1298
Viscosity	@ 40°C	mm2/s	135.0	ASTM D-445
	@ 100°C	mm2/s	13.75	ASTM D-445
Viscosity Index		-	97	ASTM D-2270
Flash Point	COC	°C	250	ASTM D-92
Pour Point		°C	-15	ASTM D-97
Base Number		mg KOH/g	15.5	ASTM D-2896
Color		-	3.0	ASTM D-1500

ADCO UNIVERSAL S3 420, 520

DESCRIPTION

ADCO UNIVERSAL S3 420, 520 are 20 TBN oils. They are high performance diesel engine oils of CF quality for use in engines operating on relatively high sulphur fuels. They are formulated from high quality base oils and additives. They are high alkaline-reserve oils suitable for medium and high-speed diesel engines using high sulphur distillate fuels.

APPLICATIONS

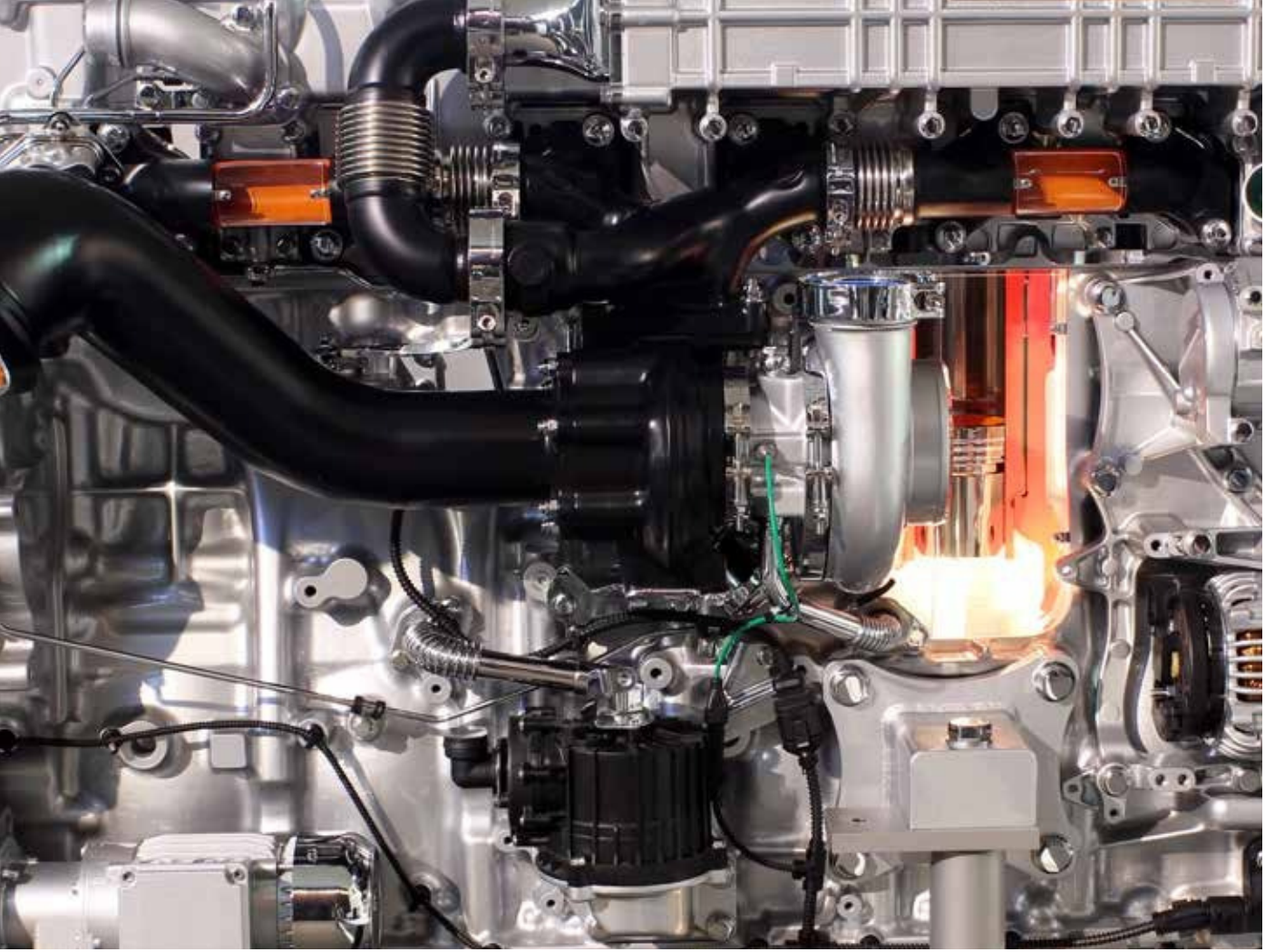
ADCO UNIVERSAL S3 420, 520 are recommended for use in high-output diesel engines where service factors require this quality of oil. They are suitable for Caterpillar pre-combustion type engines and other diesel engines using high sulphur fuel.

BENEFITS

- Excellent protection against corrosive wear in severe diesel
- service.
- Minimize rust and corrosion.
  Good detergent and dispersant
- properties.
  Contain high alkalinity reserve.

PERFORMANCE LEVEL

API .....CF



PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE		TEST METHOD
Grade		-	S3 420	S3 520	-
Specific Gravity	@ 15°C	-	0.9000	0.9030	ASTM D-1298
Viscosity	@ 40°C	mm2/s	134.5	198.0	ASTM D-445
	@ 100°C	mm2/s	13.75	17.75	ASTM D-445
Viscosity Index		-	98	97	ASTM D-2270
Flash Point	COC	°C	250	260	ASTM D-92
Pour Point		°C	-15	-9	ASTM D-97
Base Number		mg KOH/g	20.5	20.5	ASTM D-2896
Color		-	3.0	3.5	ASTM D-1500

ADCO NGEO 40

DESCRIPTION

ADCO NGEO is a low-ash detergent mineral oil designed for the lubrication of modern natural gas fueled spark-ignited engines where OEM requires oil ash content up to 0.5% max and incorporating mineral base oils with exceptional thermal stability and oxidation resistance.

BENEFITS

- Long oil life and lower oil consumption with outstanding protection against wear and corrosion while ensuring exceptional engine cleanliness.
- Low ash content reduces the risk of combustion chamber deposits and is compatible with requirements of the most stringent exhaust gas treatment systems.

PERFORMANCE LEVEL

Meets quality requirements of most major OEMs including:
• GE –JENBACHER Series 2/3/4/6; JGS320
• CATERPILLAR 3516 Tale, 3300 -3500
• MTU Series 400
• WARTSILA 220SG, 20V34SG
• WAUKESHA VHP, APG
• CUMMINS CES20074

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE		TEST METHOD
Grade		-	S3 420	S3 520	-
Specific Gravity	@ 15°C	-	0.8900	ASTM D-1298	ASTM D-1298
Viscosity	@ 40°C	mm2/s	Report	ASTM D-445	ASTM D-445
	@ 100°C	mm2/s	14.50	ASTM D-445	ASTM D-445
Viscosity Index		-	100	ASTM D-2270	ASTM D-2270
Flash Point	COC	°C	230	ASTM D-92	ASTM D-92
Pour Point		°C	-15	ASTM D-97	ASTM D-97
Base Number		mg KOH/g	5.6	ASTM D-2896	ASTM D-2896
Sulphated ash		%wt	0.46	ASTM D-1500	ASTM D-1500

ADCO HD 15W/40, 10W, 20W/20, 30, 40, 50

DESCRIPTION

ADCO HD is a heavy duty diesel engine oil. It is developed primarily for high output naturally aspirated or supercharged diesel engines, operating under severe conditions. ADCO HD is formulated from high quality base oils and chemical additives. It can be used in diesel-powered equipment both off-highway and on-highway types.

APPLICATIONS

ADCO HD is recommended for use in high-output diesel engines fitted in automotive, agricultural and construction equipments, operating in fleet and construction business where relatively high sulphur fuel is used and other severe service factors are considered.

BENEFITS

- Excellent protection against the effects of high sulphur fuels.
- Good control on high temperature deposits.
- Improved resistance to ring sticking, ring and cylinder wear, valve and combustion deposits.

PERFORMANCE LEVEL

API ..... CF for all grades
API ..... CF-4 (for 15W/40)
Allison.....C3

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS							TEST METHOD
Grade		-	15W/40	10W	20W/20	30	40	50	-
Specific Gravity	@ 15°C	-	0.8820	0.8855	0.8870	0.8960	0.9010	0.9040	ASTM D-1298
Viscosity	@ 40°C	mm2/s	99.00	46.50	72.50	93.5	134.3	197.2	ASTM D-445
	@ 100°C	mm2/s	13.75	6.75	9.0	10.75	13.75	17.75	ASTM D-445
Viscosity Index		-	140	98	97	98	98	97	ASTM D-2270
Flash Point	COC	°C	230	225	230	230	250	260	ASTM D-92
Pour Point		°C	-27	-33	-27	-18	-15	-9	ASTM D-97
Base Number		mg KOH/g	10	10	10	10	10	10	ASTM D-2896
Color		-	2.5	L2.5	L2.5	L2.5	L3.0	3.0	ASTM D-1500
CCS Vis	°C	cP	6500	6500	6000	-	-	-	ASTM D-5293
		°C	@-20	@-25	@-15				

ADCO STUO 15W/40

DESCRIPTION

ADCO STUO is designed to serve nearly the entire farm lubricating oil needs all year round in all types of tractor engines, transmissions, final drives, hydraulic system and brakes.

APPLICATIONS

ADCO STUO is recommended for use in gasoline engines and other utility vehicles around the farm. It can be used as transmission oil, hydraulic oil, wet-brakes and power take-off clutches.

BENEFITS

- Multi application additive package enables use in engines, transmission, final drives and hydraulic system.
- Protection against acid, varnish, carbon deposits, formation of gums, and reduces oil thickening.
- Multi-viscosity characteristics ensure rapid oil circulation on start-up, preventing wear.
- Special friction modifier component that allows smooth action of the wet brakes and power take-off clutches.

PERFORMANCE LEVEL

API .....CE/SF
CCMC.....D3/G3
MIL.....L-2104D
MB 227.1
API GL-4
CAT.....TO-2
Allison.....C4
John Deere.....J-20A
Ford.....M2C 159B
Massey Ferguson.....M 1139
ZF TE-ML....06 page 3 & 4 Part B & 07
Mack.....EOK-2

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE	TEST METHOD
Grade		-	15W/40	-
Specific Gravity	@ 15°C	-	0.876	ASTM D-1298
Viscosity	@ 40°C	mm2/s	0	ASTM D-445
	@ 100°C	mm2/s	113.0	ASTM D-445
Viscosity Index		-	13.75	ASTM D-2270
Flash Point	COC	°C	120	ASTM D-92
Pour Point		°C	230	ASTM D-97
Base Number		mg KOH/g	-27	ASTM D-2896
Color		-	11	ASTM D-1500
CCS Vis	@ -20°C	cP	L3.0	ASTM D-5293
			6500	

ADCO RR SUPER-P

DESCRIPTION

ADCO RR SUPER-P is designed to meet the demands of severe service imposed by the newer engines particularly when operating on high sulphur fuels. It is formulated from high-quality base stocks together with zinc free additives to give superior engine protection. It provides superior thermal stability, oxidation resistance, high alkalinity, high detergent and dispersant properties.

APPLICATIONS

ADCO RR SUPER-P is designed to lubricate the two-stroke General Motors-Electro Motive Division (EMD) engines used in railway, marine, offshore and power generation service.

BENEFITS

- Excellent oxidation stability.
- Good alkalinity retention.
- Excellent protection of silver-coated and turbocharger bearings of EMD engines.
- Suitable for railroad and marine engines which require zinc-free oils.

PERFORMANCE LEVEL

API .....CF
LMOA.....Generation V

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE	TEST METHOD
Grade		-	-	-
Specific Gravity	@ 15°C	-	0.8800	ASTM D-1298
Viscosity	@ 40°C	mm2/s	134.3	ASTM D-445
	@ 100°C	mm2/s	13.75	ASTM D-445
Viscosity Index		-	98	ASTM D-2270
Flash Point	COC	°C	250	ASTM D-92
Pour Point		°C	-15	ASTM D-97
Base Number		mg KOH/g	17	ASTM D-2896
Color		-	3 Dil	ASTM D-1500

ADCO LUBE

AUTOMOTIVE GEAR OILS

GEAR OIL GX 90, 85W/90, 80W/90, 85W/140, 140

DESCRIPTION

GEAR OIL GX series is an extreme-pressure automotive gear lubricant formulated from solvent refined mineral base oils and contains special sulphur phosphorus additives to produce a superior gear lubricant with extreme pressure characteristics and thermal stability for automotive applications over a wide range of temperatures and heavy duty conditions.

APPLICATIONS

GEAR OIL GX is recommended for the type of service characteristics of gears, particularly hypoid, in passenger cars and other automotive equipments operated under high-speed/shock load, high-speed/low torque and low-speed/high-torque conditions.

BENEFITS

- Excellent protection against wearing and scoring produced by high speed and heavy loads.
- Suitable for a wide variety of applications and service conditions.
- Superior protection against rusting, pitting and corrosion.
- Excellent load carrying capacity and good antifoam properties.
- Compatible with seals and gaskets.

PERFORMANCE LEVEL

API.....GL-5

NOTE:
ADCO Lube GEAR OIL GX LS 90 (GL-5) is a limited slip gear oil available on request.

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE					TEST METHOD
Grade		-	90	85W/90	80W/90	85W/140	140	-
Specific Gravity	@ 15°C	-	0.9030	0.9030	0.8965	0.9085	0.9060	ASTM D-1298
Viscosity	@ 40°C	mm2/s	200.0	200.0	140.0	405.0	405.0	ASTM D-445
	@ 100°C	mm2/s	17.50	17.50	14.00	28.25	28.25	ASTM D-445
Viscosity Index		-	96	96	96	96	96	ASTM D-2270
Flash Point	COC	°C	220	220	210	220	220	ASTM D-92
Pour Point		°C	-9	-12	-30	-12	-9	ASTM D-97
Color		-	2.5	2.5	2.5	3.5	3.5	ASTM D-1500
Color		-	3 Dil					ASTM D-1500

GEAR OIL GP
90, 85W/90, 85W/140, 140

DESCRIPTION

GEAR OIL GP is a high quality gear lubricant blended from solvent-refined mineral base oils and selected sulphur and phosphorous chemical additives. Due to its high shear stability they provide excellent protection for gears and can be used over a wide range of temperature.

APPLICATIONS

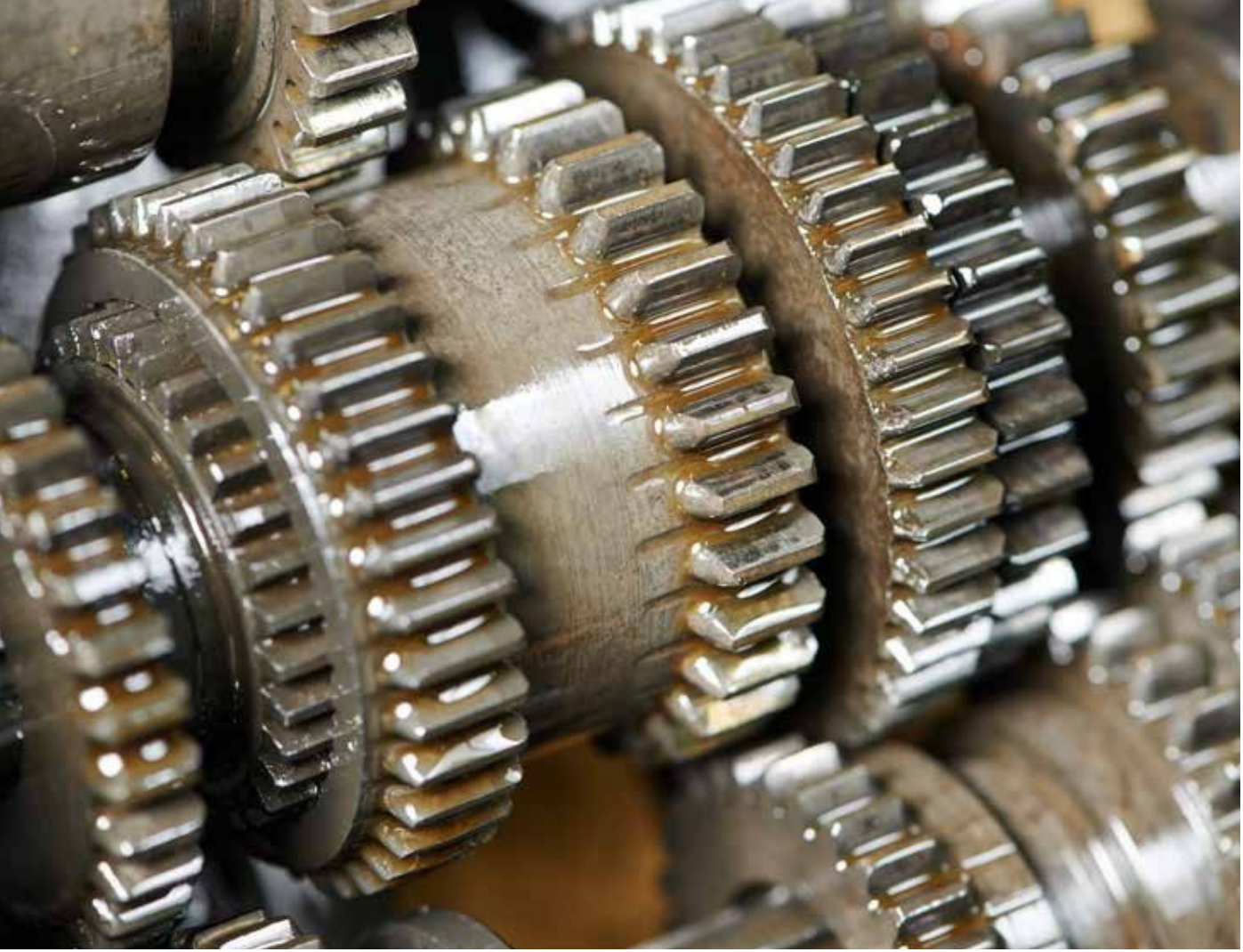
GEAR OIL GP is recommended for the type of service characteristics of gears, particularly hypoid, in passenger cars and other automotive type equipment, operated under high speed, low torque and low-speed/high torque conditions.

BENEFITS

- Formulated for automotive high speed gears.
- Excellent lubrication without channeling at low-temperatures.
- Superior protection against rusting, pitting and corrosion.
- Suitable for heavy duty service in truck and bus gears operating at high temperatures.
- Provides good protection against wear.

PERFORMANCE LEVEL

API.....GL-4



PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE				TEST METHOD
Grade		-	90	85W/90	85W/140	140	-
Specific Gravity	@ 15°C	-	0.9010	0.9005	0.9070	0.9070	ASTM D-1298
Viscosity	@ 40°C	mm2/s	200.0	200.0	460.0	460.0	ASTM D-445
	@ 100°C	mm2/s	17.50	17.50	30.50	30.50	ASTM D-445
Viscosity Index		-	96	96	96	96	ASTM D-2270
Flash Point	COC	°C	220	220	220	220	ASTM D-92
Pour Point		°C	-9	-15	-12	-9	ASTM D-97
Color		-	3.0	3.0	3.5	3.5	ASTM D-1500
Color		-	3 Dil				ASTM D-1500

GEAR OIL GX LS 90
LIMITED SLIP DIFFERENTIAL GEAR OIL

DESCRIPTION

ADCO GEAR OIL GX LS 90 is an extreme pressure, API GL-5 automotive gear oil specially designed to meet the requirements of many limited-slip differentials of self –locking axles fitted in passenger car, utility vehicles, earth moving and agricultaral equipments. It is friction-modified to help eliminate the stick-slip chatter associated with low-speed, high-torque operation of limited- slip diffentials.

BENEFITS

- Good anti-rust & anti-corrosion
- properties Extreme pressure
- characteristics
  Eliminates vibration and chatter in
- stressed self-locking axles.
- Stable at high temperatures.
  Controlled and continuous frictional
- properties
  Provides excellent protection against worm or stripped gear teeth under all
- operating conditions.
  Compatible with all conventional seal material used by axle manufacturers.

PERFORMANCE LEVEL

It meets or exceeds
- ZF against ZF TE-ML 05C, 12C
- STEYR & FORD M2C 104A

TYPICAL INSPECTIONS

The values shown here are representative of current production and may vary within modest range.

TYPICAL INSPECTION		ADCO GEAR OIL GX LS 90
Specific Gravity	@ 15°C	0.899
Kin. Viscosity	@ 40°C, cSt	166
Kin. Viscosity	@ 100°C, cSt	17
Viscosity Index		109
Flash Point	COC °C	212
Pour Point	°C	-33

ADCO
LUBE

TR
ANSMISSION
FLUIDS

TRANSMISSION OIL T4 50

DESCRIPTION

TRANSMISSION OIL T4 is specially developed to meet the new stringent specifications of both Caterpillar TO-4 and Allison C-4 transmission requirement. It is formulated from high quality, solvent refined base oils and balanced additive system providing excellent characteristics.

APPLICATONS

TRANSMISSION OIL T4 is recommended specifically for Caterpillar power shift transmissions, drive trains, wet brakes and final drives requiring the TO-4 specification. It is recommended for on-highway and off-highway automatic transmissions using the Allison C-4 specification. It can also be used where former TO-2 and C3 specifications are applicable.

BENEFITS

- Excellent protection against wearing and scoring produced by high speed and heavy loads.
- Provides smother operation and extends clutch disc life.
- Higher anti-wear protection.
- Longer drain intervals.
- Effective rust and corrosion protection.
- Excellent multifunctional characteristics make it also suitable for some hydraulic and light-duty gear applications.

PERFORMANCE LEVEL

CAT TO-4.
Allison C4.

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE	TEST METHOD
Grade		-	T4- 50	-
Specific Gravity	@ 15°C	-	0.9080	ASTM D-1298
Viscosity	@ 40°C	mm2/s	203.0	ASTM D-445
	@ 100°C	mm2/s	17.75	ASTM D-445
Viscosity Index		-	95	ASTM D-2270
Flash Point	COC	°C	250	ASTM D-92
Pour Point		°C	-9	ASTM D-97
Color		-	3.5	ASTM D-1500
Base Number		mg KOH/gm	11.6	ASTM D-2896

AUTOMATIC TRANSMISSION FLUID DII

DESCRIPTION

AUTOMATIC TRANSMISSION FLUID DII is formulated from special high quality solvent refined mineral base oil combined with special additives. It serves as a power transmission fluid in the torque converter, hydraulic fluid in the control and servo systems, as a lubricant for bearing and gears and as a friction-controlling medium for bands and clutches.

APPLICATIONS

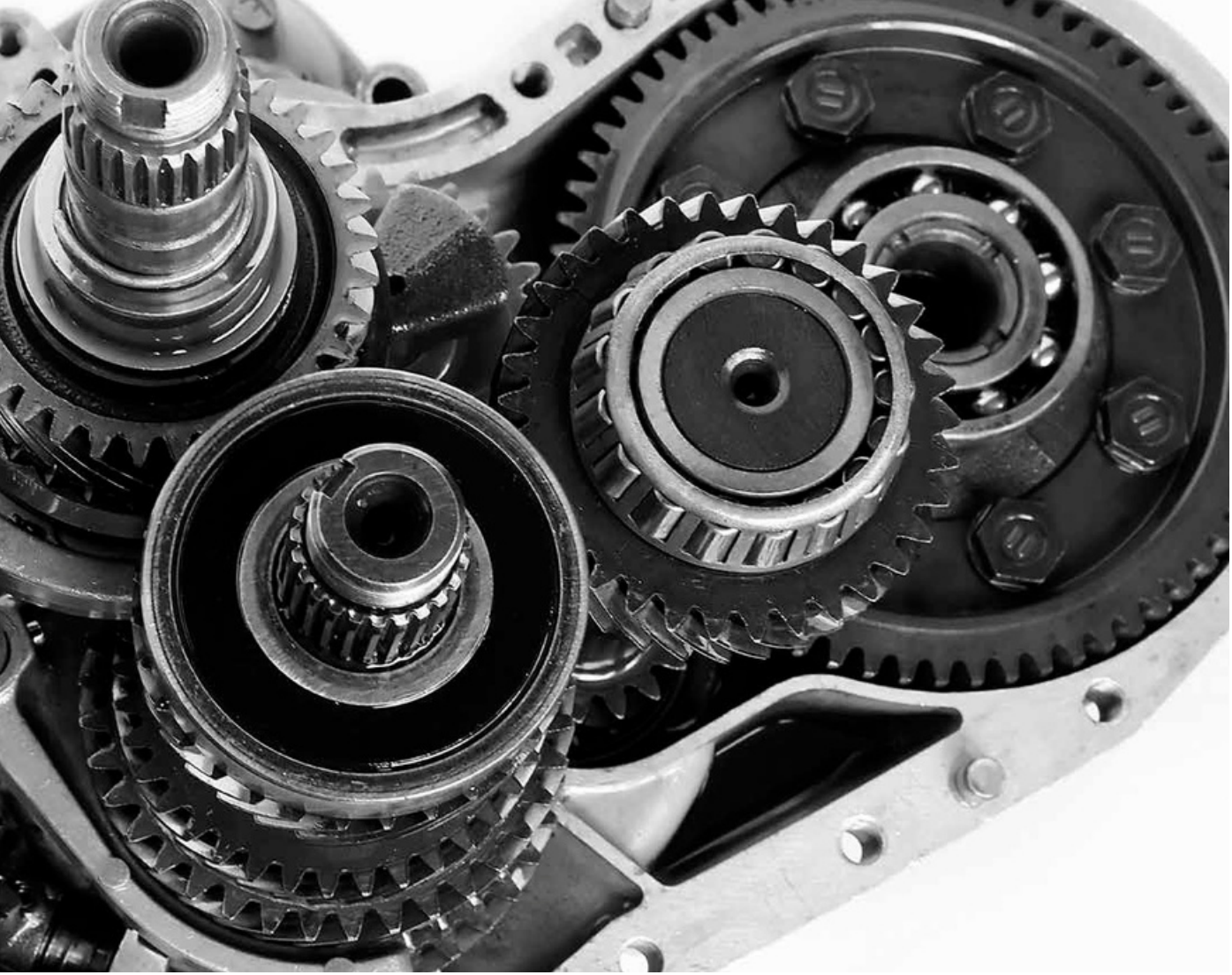
AUTOMATIC TRANSMISSION FLUID DII is formulated to meet the requirements of passenger car and light truck automatic transmissions, power steering and other hydraulic systems.

BENEFITS

- Effective frictional characteristics for smooth
- shifting. Excellent fluidity at low temperature
- application.
- Good protection against wear.
  Reduced foaming and fluid loss under severe
- service conditions.
  Protection against high-temperature deposits in heavy duty service.

PERFORMANCE LEVEL

Dexron II, Dexron.
Type A suffix A.
Allison C4.



PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE	TEST METHOD
Grade		-	ATF D-II	-
Specific Gravity	@ 15°C	-	0.8525	ASTM D-1298
Viscosity	@ 40°C	mm2/s	33.70	ASTM D-445
	@ 100°C	mm2/s	7.300	ASTM D-445
Viscosity Index		-	190	ASTM D-2270
Flash Point	COC	°C	170	ASTM D-92
Pour Point		°C	-48	ASTM D-97
Color		-	Red	VISUAL

ATF DEXRON III

DESCRIPTION

ATF DEXRON III is a high performance, multifunctional power transmission fluid satisfying both General Motors GM Dexron III, Ford revised friction modified Mercon and Allison C-4 specifications.

APPLICATIONS

ATF DEXRON III is recommended for passenger car and commercial vehicle with automatic transmission, hydraulic systems of mobile and off-high way equipment and industries equipment applications.

BENEFITS

- Friction modifier provides smooth shifting & trouble free operations.
- Excellent oxidation resistance resulting in cleaner transmissions.
- Compatible with all types of rubbers, elastomers and metals and provides protection against wear and leakage.
- Excellent low-temperature fluidity.
- Better shear stability.
- Better component compatibility.

PERFORMANCE LEVEL

Approved GM.....Dexron III H
Revised Ford Mercon
Allison.....C4
Allison.....TES-389

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE	TEST METHOD
Grade		-	ATF D III-H	-
Specific Gravity	@ 15°C	-	0.8540	ASTM D-1298
Viscosity	@ 40°C	mm2/s	34.30	ASTM D-445
	@ 100°C	mm2/s	7.300	ASTM D-445
Viscosity Index		-	185	ASTM D-2270
Flash Point	COC	°C	185.0	ASTM D-92
Pour Point		°C	-42	ASTM D-97
Color		-	Red	VISUAL

ADCO

LUBE

2 & 4 STROKE ENGINE OIL

OUT BOARD ENGINE OIL

DESCRIPTION

OUTBOARD ENGINE OIL is an ashless lubricating oil formulated to meet the critical requirements of high performance, water or air cooled two-stroke gasoline engines.

APPLICATIONS

OUTBOARD ENGINE OIL is recommended for high output two-stroke water or air cooled gasoline engines. It should be added with the fuel in the ratio as recommended by the equipment manufacturer.

BENEFITS

- Controls combustion chamber and spark plug deposits build-up.
- Excellent miscibility with gasoline.
- Keeps pistons, rings, plugs and exhaust ports clean.
- Resistance to low temperature gel
- formation. Protects against rust by fresh or salt water.

PERFORMANCE LEVEL

NMMA ..... TC-W3 R

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE	TEST METHOD
Grade		-	-	-
Specific Gravity	@ 15°C	-	0.8785	ASTM D-1298
Viscosity	@ 40°C	mm2/s	Report	ASTM D-445
	@ 100°C	mm2/s	7.30	ASTM D-445
Flash Point	PMCC	°C	72	ASTM D-93
Pour Point		°C	-30	ASTM D-97
Color		-	Green	VISUAL

SUPREME PLUS 2T ENGINE OIL

DESCRIPTION

SUPREME PLUS 2T ENGINE OIL is an advanced technology top graded 2-stroke motor oil formulated with fully synthetic base oil and low-ash additive package to release maximum power with minimum drag.

APPLICATIONS

SUPREME PLUS 2T ENGINE OIL is recommended for high performance motorcycles, especially for road use. It is also recommended for smaller engines fitted in scooters, lawnmowers and other small equipment. It should be added with gasoline in the ratio recommended by the equipment manufacturer.

BENEFITS

- The superior combustion characteristics of the special blend of unique fully synthetic
  oil and additives significantly reduce
- visible smoke in exhaust emission
  Controls combustion chamber and spark-
- plug deposit build-up.
- Excellent miscibility with gasoline.
  Keeps pistons, rings, plugs and exhaust ports clean.

PERFORMANCE LEVEL

JASO.....FD
API.....TC
ISO.....L-EGD

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE	TEST METHOD
Grade		-	-	-
Specific Gravity	@ 15°C	-	0.8720	ASTM D-1298
Viscosity	@ 40°C	mm2/s	-	ASTM D-445
	@ 100°C	mm2/s	9.00	ASTM D-445
Viscosity Index		-	-	ASTM D-2270
Flash Point	PMCC	°C	70	ASTM D-93
Pour Point		°C	-30	ASTM D-97
Color		-	2.0	ASTM D-1500

SUPREME 2T ENGINE OIL

DESCRIPTION

SUPREME 2T ENGINE OIL is a semi-synthetic two-cycle oil formulated from a special blend of mineral and synthetic oil and low-ash additive package to release maximum power with minimum drag.

APPLICATIONS

SUPREME 2T ENGINE OIL is recommended for high performance, motorcycles, especially for road use. It is also recommended for smaller engine fitted in scooters, lawn mowers and other small equipment. It should be added with gasoline in the ratio recommended by the equipment manufacturer.

BENEFITS

- Superior combustion characteristics of the special blend of Semi-Synthetic and highly refined mineral oils and additives, significantly reduces visible smoke in exhaust emission.
- Controls combustion chamber and spark plug deposit build-up.
- Excellent miscibility with gasoline.
- Keeps pistons, rings, plugs and exhaust ports clean.

PERFORMANCE LEVEL

JASO.....FD
API.....TC
ISO.....L-EGD

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE	TEST METHOD
Grade		-	-	-
Specific Gravity	@ 15°C	-	0.8720	ASTM D-1298
Viscosity	@ 40°C	mm2/s	-	ASTM D-445
	@ 100°C	mm2/s	9.0	ASTM D-445
Viscosity Index		-	-	ASTM D-2270
Flash Point	PMCC	°C	70	ASTM D-93
Pour Point		°C	-30	ASTM D-97
Color		-	2.0	ASTM D-1500

4T-4 STROKE ENGINE OIL

DESCRIPTION

4T-4 STROKE ENGINE OIL is multi-grade (20W/50) superior lubricating oil developed specifically for large motorcycle four-stroke gasoline engines working under severe duty conditions.

APPLICATIONS

4T-4 STROKE ENGINE OIL is highly recommended for 4 Stroke motor engines such as Honda, Suzuki, Kawasaki, Yamaha and other motor cycles.

BENEFITS

- Having stable viscosity both at low and high temperatures.
- Prevent wet clutch slippage
- Excellent oxidations stability under exposure to high operating temperature
- Keeping engine clean and providing excellent protection against piston deposit formation
- Providing optimum protection against rust and keeping engine parts from wear.
- Keeping motor engine operate much better so that transmission friction is made as minimum as possible.
- Protect vital gear & clutch component to extend its service life.

PERFORMANCE LEVEL

API.....SL/CF
ACEA.....A3/B3/04
MB.....229.1
VW.....505 00
JASO.....MA

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE	TEST METHOD
Grade		-	20W/50	-
Specific Gravity	@ 15°C	-	0.8950	ASTM D-1298
Viscosity	@ 40°C	mm2/s	150.5	ASTM D-445
	@ 100°C	mm2/s	17.75	ASTM D-445
Viscosity Index		-	130	ASTM D-2270
Flash Point	COC	°C	240	ASTM D-92
Pour Point		°C	-27	ASTM D-97
Base Number		mg KOH/g	8	ASTM D-2896
Color		-	L3.5	ASTM D-1500
CCS Vis	@-15°C	cP	8500	ASTM D-5293

ADCO

LUBE

COOL ANTS

AUTO COOL
33%, 40%, 50%, 100%

DESCRIPTION

AUTO COOL, formulated from mono-ethylene glycol (MEG), is recommended for use in liquid cooling systems of automotive and industrial gasoline and diesel engines. They are available in various concentrations ready for use. It is harmless to rubber and does not foam or clog radiators.

APPLICATIONS

AUTO COOL protects cooling systems of gasoline and diesel engine against rust in all seasons. It provides ideal cooling, effective protection against corrosion and scale deposit formation in the cooling systems year-round, resulting in longer radiator life.

BENEFITS

- High boiling point gives better cooling performance in high temperature condition.
- Excellent anti-foam properties.
- Protects the radiator against rust & corrosion.
- Compatible with ordinary summer coolant.
- Protection against excessive evaporation.
- Provides year round cooling properties.

PERFORMANCE LEVEL

BS.....6580
ASTM..... D3306

Complies with most engine manufacturer’s requirements for fulfill coolants.

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE				TEST METHOD
Grade		-	33%	40%	50%	100%	-
Specific Gravity	@ 20°C	-	1.050	1.052	1.055	1.130	ASTM D-1298
Color		-	Blue	Blue	Blue	Blue	ASTM D-1500
pH			8.0	7.9	7.9	-	ASTM D-1287

ADCO
LUBE

INDUSTRIAL LUBRICANTS

INDUSTRIAL GEAR OIL EP 68, 100, 150, 220, 320, 460, 680

DESCRIPTION

INDUSTRIAL GEAR OIL EP is lead-free premium quality, heavy duty industrial gear lubricant formulated for enclosed gear sets operating under severe conditions.
INDUSTRIAL GEAR OIL EP is formulated from high quality, high VI base oils selected for its oxidation stability and water separating characteristics. Additives are incorporated which provide extreme pressure and anti-wear properties, rust and corrosion protection, increased oxidation stability, improved resistance to foam and excellent high load performance characteristics.

APPLICATIONS

INDUSTRIAL GEAR OIL EP is recommended for industrial enclosed gear drives representing load and speed conditions of extreme severity and also suitable for the lubrication of worm gear units. Although designed primarily for the lubrication of gears, their high overall performance makes it possible to extend their use to system involving gears, plain bearings, rolling bearings and sliding surfaces.

BENEFITS

- Excellent load-carrying capacity.
- Outstanding anti-wear properties.
- Excellent oxidation stability.
- Rust and corrosion protection.
- Excellent lubricity and good anti-foam
- properties. Minimize friction, resulting in reduced bulk oil temperature.
- Effective demulsibility for rapid water
- separation. Resistance to micro-pitting.

PERFORMANCE LEVEL

DIN 51517 PART3
AGMA 9005-D94
US Steel 224
David Brown S1.53 101

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE							TEST METH-OD
Grade		-	68	100	150	220	320	460	680	-
Specific Gravity	@ 15°C	-	0.8860	0.8940	0.8960	0.8990	0.9025	0.9030	0.9245	ASTM D-1298
Viscosity	@ 40°C	mm2/s	68.00	100.0	150.0	220.0	320.0	460.0	680.0	ASTM D-445
	@ 100°C	mm2/s	8.655	11.25	14.80	18.75	23.90	30.35	35.85	ASTM D-445
Viscosity Index		-	98	98	98	95	95	95	85	ASTM D-2270
Flash Point	COC	°C	234	240	240	238	238	238	240	ASTM D-92
Pour Point		°C	-24	-24	-21	-18	-15	-12	-9	ASTM D-97
Color		-	1.0	L2.5	L2.5	2.5	3.0	3.0	6.5	ASTM D-1500

TRANSFORMER OIL

DESCRIPTION

TRANSFORMER OIL is an un-inhibited refined naphthenic oil specifically manufactured for use in electric transformers and switchgears as an insulating and heat transfer medium.

APPLICATIONS

TRANSFORMER OIL is used as an insulating and cooling medium where oil of high thermal and oxidation stability is required. It is also suitable where good gas absorbing properties are necessary like transformer oil immersed switchgear, circuit breakers etc.

BENEFITS

- High dielectric strength.
- Very low pour point.
- Free from acids and corrosive sulphur.
- Compatible with transformer construction material.

PERFORMANCE LEVEL

BS 148
I.E.C..... 60296(03)

Transformer Oil Inhibited also available on request.

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE	TEST METHOD
Grade		-	32	-
Specific Gravity	@ 15°C	-	0.8780	ASTM D-1298
Viscosity	@ 40°C	mm2/s	9.00	ASTM D-445
	@ 100°C	mm2/s	-	ASTM D-445
Viscosity Index		-	-	ASTM D-2270
Flash Point	PMCC	°C	144	ASTM D-93
Pour Point		°C	-45	ASTM D-97
TAN		mg KOH/g	0.005	ASTM D-974
Color		-	L0.5	ASTM D-1500
Water		ppm	20	ASTM D-1533
Electric Strength		KV	70	ASTM D-1816

GENERAL PURPOSE OIL 32, 68, 100, 150

DESCRIPTION

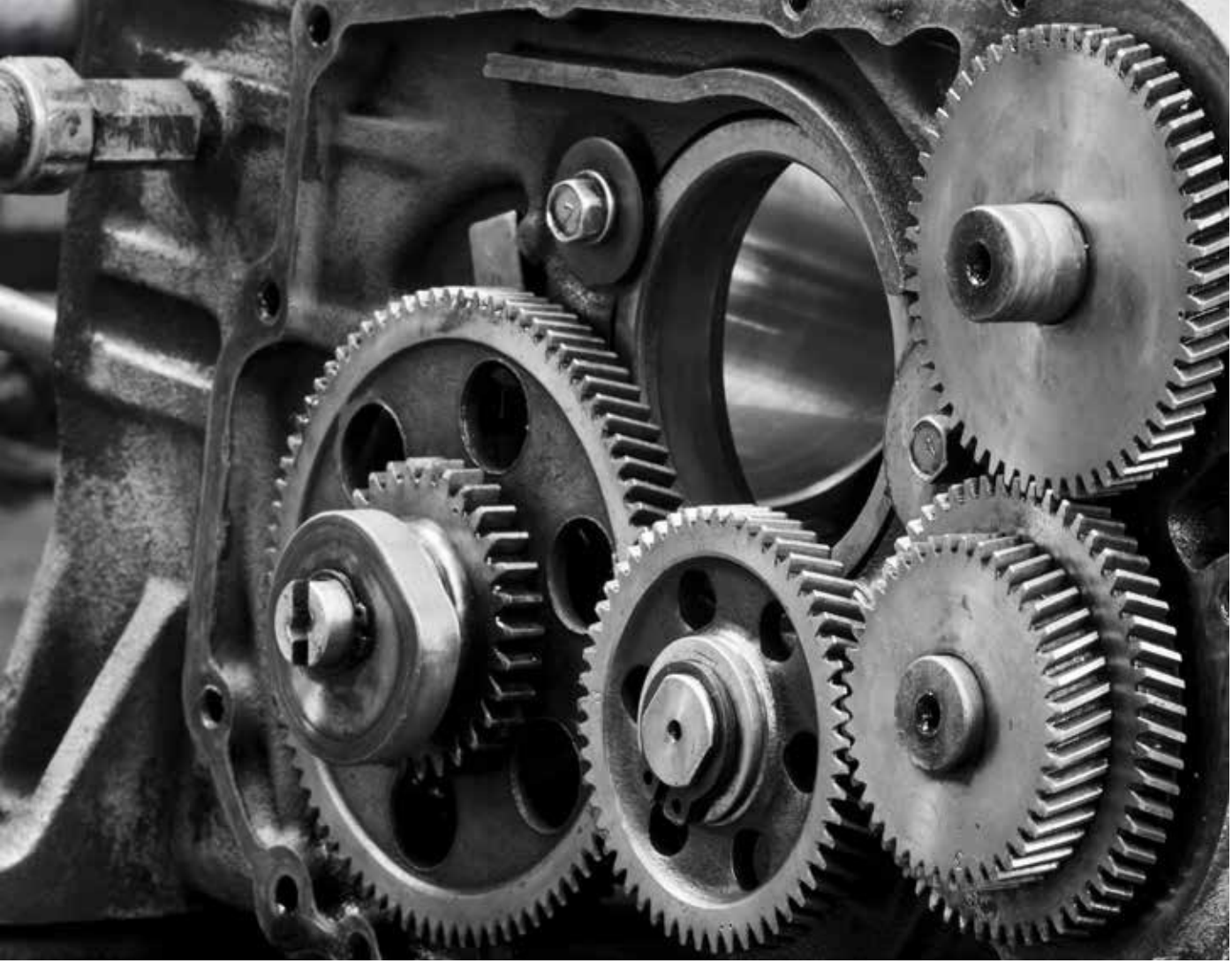
GENERAL PURPOSE OIL is a high quality solvent-refined paraffinic oil containing no additives and possess inherent oxidation stability.

APPLICATIONS

GENERAL PURPOSE OIL is suitable for bearing and gear lubrication systems where the operating conditions are not severe. It is recommended for use in re-circulating and other closed oil systems. Also suitable for many industrial hydraulic applications where non additive oils are required.

BENEFITS

- Inherent Oxidation
- Stability. Low Volatility.



PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE				TEST METHOD
Grade		-	68	100	150	220	-
Specific Gravity	@ 15°C	-	0.8650	0.8730	0.8850	0.8920	ASTM D-1298
Viscosity	@ 40°C	mm2/s	31.00	68.00	95.00	150.0	ASTM D-445
	@ 100°C	mm2/s	5.23	8.60	10.75	14.60	ASTM D-445
Viscosity Index		-	98	96	96	96	ASTM D-2270
Flash Point	COC	°C	214	230	240	250	ASTM D-92
Pour Point		°C	-15	-12	-9	-12	ASTM D-97
Color		-	0.5	1.0	1.5	2.0	ASTM D-1500

COMPRESSOR OIL 32, 46, 68, 100, 150

DESCRIPTION

COMPRESSOR OIL has been developed to meet the latest changes in air compressor designs, resulting in increase capacity and efficiency. It is formulated from a high-grade base stock with a narrow distillation range. It contains specially selected additives, which enhance lubricity, anti-wear properties and protect compressor parts against oxidation and rust. It is designed to lubricate both cylinders and crankcases. It minimizes carbon and sludge deposits, thereby extending time between service intervals for cleaning valves, ports and intercoolers.

APPLICATIONS

COMPRESSOR OIL is specially suited for rotary and reciprocating compressors both for stationary and mobile applications. (air discharge temperature up to 220°C). It also can be used in vacuum pumps because of their low volatility.

BENEFITS

- Longer intervals between cleaning of valves, heat exchangers ports and piping ensures lower maintenance cost.
- Less carbon and deposit formation reduces fire and explosion hazards.
- Single oil lubricates cylinders and
- crankcase. Suitable for both large and small compressors.

PERFORMANCE LEVEL

DIN 51506 VD-L

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE					TEST METHOD
Grade		-	32	46	68	100	150	-
Specific Gravity	@ 15°C	-	0.8650	0.8710	0.8870	0.8810	0.8905	ASTM D-1298
Viscosity	@ 40°C	mm2/s	31.00	46.00	68.00	97.50	147.5	ASTM D-445
	@ 100°C	mm2/s	5.23	6.75	8.70	10.90	14.50	ASTM D-445
Viscosity Index		-	98	98	98	96	96	ASTM D-2270
Flash Point	COC	°C	214	220	230	240	250	ASTM D-92
Pour Point		°C	-33	-30	-30	-27	-24	ASTM D-97
TAN		mg KOH/g	0.10	0.10	0.10	0.10	0.10	ASTM D-974
Color		-	0.5	1.0	L1.5	1.5	L2.0	ASTM D-1500

HEAT TRANSFER FLUID GP II

DESCRIPTION

HEAT TRANSFER FLUID GP II is a high quality heat transfer fluid with Group II base oils. It has relatively low viscosity so it has good viscosity versus temperature characteristic.

APPLICATIONS

HEAT TRANSFER GROUP II is suitable for enclosed heat transfer system that requires mineral oil.

BENEFITS

- Capable of an extremely long service life without deposit formation or viscosity increase.
- High heat transfer rates with improved operating efficiency.
- Protection against corrosion.
- Flexible for combined heating and cooling cycles.

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE	TEST METHOD
Grade		-	-	-
Specific Gravity	@ 15°C	-	0.8560	ASTM D-1298
Viscosity	@ 40°C	mm2/s	30.00	ASTM D-445
	@ 100°C	mm2/s	5.25	ASTM D-445
Viscosity Index		-	105	ASTM D-2270
Flash Point	COC	°C	214	ASTM D-92
Pour Point		°C	-15	ASTM D-97
TAN		mg KOH/g	0.01	ASTM D-974
Color		-	L0.5	ASTM D-1500

SOLUBLE CUTTING OIL

DESCRIPTION

SOLUBLE CUTTING OIL is formulated from high quality base oils and combination of passive and extreme pressure additive package especially developed for cutting oils used in severe operations. This cutting oil is extremely effective by providing rust and corrosion protection of parts, cutting tools, and the machine.

APPLICATIONS

SOLUBLE CUTTING OIL is multipurpose, neat cutting oil for turning, milling, reaming, drilling, shaping, broaching of a wide variety of metals. It has outstanding emulsion stability and readily mixes with water. It is recommended at 10:1 up to 20:1 water oil dilution for milling, boring and turning and 40:1 for grinding. The emulsion is prepared by adding oil to water and not vice versa. It is non-staining and can be used on both ferrous and non-ferrous metals.

BENEFITS

- Gives excellent surface finish on parts.
- Good oxidation stability.
- Corrosion and rust protection of parts and machine.
- Excellent cooling properties that avoid overheating of parts and chips in machining
- operation. Reduce tool wear.
- Helps prevent varnish and sludge formation.
- Non-staining to ferrous and non-ferrous metals.
- Increase tool life and faster machining.

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE	TEST METHOD
Grade		-	68	-
Specific Gravity	@ 15°C	-	0.8950	ASTM D-1298
Viscosity	@ 40°C	mm2/s	67.50	ASTM D-445
Corrosion			0/1-1	IP- 125
Color		-	3.0	ASTM D-1500
Emulsion Stability (400 ppm) - oil		ml	NIL	IP-263
Emulsion Stability (400 ppm) - cream		ml	NIL	IP-263
Rust Prevention Breakpoint		-	20:1	IP-287
Ph of Emulsion (20:1)		-	9.30	ASTM D-1287

CIRCULATING OIL
46, 68, 100, 150, 220

DESCRIPTION

CIRCULATING OILS are formulated from highly refined paraffinic base oils chemically stable with high Viscosity Index and chemical additives including oxidation, wear, rust inhibitors and good demulsification properties.

APPLICATIONS

CIRCULATING OILS are particularly suited for bearing and circulating systems. They may also be used as hydraulic fluid, industrial gear lubricants and general purpose oils.

BENEFITS

- Protection against rust and corrosion.
- Good resistance to thermal degradation.
- Long service life.
- Wide range of applications.

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE					TEST METHOD
Grade		-	46	68	100	150	220	-
Specific Gravity	@ 15°C	-	0.8730	0.8800	0.8861	0.8900	0.8970	ASTM D-1298
Viscosity	@ 40°C	mm2/s	46	68	95.00	150.0	220.0	ASTM D-445
	@ 100°C	mm2/s	6.7	8.6	10.75	14.60	18.90	ASTM D-445
Viscosity Index		-	97.0	97.0	96.0	96.0	96.0	ASTM D-2270
Flash Point	COC	°C	225	230	240	250	260	ASTM D-92
Pour Point		°C	-24	-21	-21	-18	-12	ASTM D-97
TAN		mg KOH/g	0.25	0.25	0.25	0.25	0.25	ASTM D-974
Color		-	2.0	L2.5	L2.5	L2.5	2.5	ASTM D-1500

HYDRAULIC OIL H
22, 32, 46, 68, 100, 150

DESCRIPTION

HYDRAULIC OIL H is blended from high quality, stable solvent refined base oils and incorporated with balanced additive system that includes anti-wear and oxidation inhibitors. Utilization of Hydraulic Oils will provide excellent wear protection in hydraulic and circulation systems and good air release properties.

APPLICATIONS

HYDRAULIC OIL H is recommended for most types of hydraulic systems, moderately loaded gears and bearing lubricated by circulation bath and ring oiling. It is available in a wide range of viscosities to meet a variety of design and operating requirements.

BENEFITS

- Excellent anti-wear performance.
- Provides rust and corrosion
- protection. Superior Filterability.
- Low Friction.
- Excellent water separation, air release and antifoam properties.
- Seal and paint compatibility.
- Excellent oxidation resistant.

PERFORMANCE LEVEL

Meet the following specifications
Denison HFO and HF2.
Vickers 35VQ25.
Cincinnati Machine P-68, P-69, P-70.
DIN 51524 Part 2& 3.
AFNOR NFE-48-603 (HM), (HV)
Denison T6C-20 Vane Pump.
AFNOR NE 48-690, NF E-48-691 Filterability.

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE						TEST METHOD
Grade		-	22	32	4668		100	150	-
Specific Gravity	@ 15°C	-	0.8500	0.8565	0.8695	0.8820	0.8870	0.8890	ASTM D-1298
Viscosity	@ 40°C	mm2/s	22.00	31.00	46.00	68.00	97.00	155.0	ASTM D-445
	@ 100°C	mm2/s	4.3	5.25	6.75	8.70	11.00	15.20	ASTM D-445
Viscosity Index		-	98	98	98	98	98	96	ASTM D-2270
Flash Point	COC	°C	200	214	220	230	240	240	ASTM D-92
Pour Point		°C	-33	-33	-30	-27	-21	-21	ASTM D-97
TAN		mg KOH/g	0.40	0.40	0.40	0.40	0.40	0.40	ASTM D-974
Color		-	0.5	L1.0	1.0	1.5	2.0	2.5	ASTM D-1500

HYDRAULIC OIL HP 32, 46, 68, 100

DESCRIPTION

HYDRAULIC OIL HP are premium quality hydraulic oils of high viscosity index. They are blended from high quality base oils incorporated with special additives that impart superior viscosity/ temperature characteristics, anti-wear and oxidation inhibitors. They also provide excellent wear protection in hydraulic and circulation system, good air release properties and they remain suitable for widely varying ambient temperatures.

APPLICATONS

HYDRAULIC OIL HP are specially suited for hydraulic systems which are subjected to extreme temperature suitable for hydraulic system subjected to wide variation in temperature or where low viscosity change with fluctuating temperature is required in addition to comply with the applications of HYDRAULIC OIL H requirements.

BENEFITS

- Very low viscosity variations with
- temperature. High shear stability.
- Excellent water separation, air release and anti-foam properties.
- Excellent oxidation resistant.
- Excellent filterability.
- Efficient anti-wear performance.
- Rust and corrosion protection.
- Seal and paint compatibility.

PERFORMANCE LEVEL

Meet the following specifications
Denison HFO and HF2.
Vickers 35VQ25.
Cincinnati Machine P-68, P-69, P70.
DIN 51524 Part 2&3.
AFNOR NFE-48-603 (HM), (HV)
Denison T6C-20 Vane Pump.
AFNOR NE 48-690, NF E-48-691
Filterability.

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE				TEST METHOD
Grade		-	32	46	68	100	-
Specific Gravity	@ 15°C	-	0.8580	0.8650	0.8735	0.8750	ASTM D-1298
Viscosity	@ 40°C	mm2/s	32.00	46.00	68.00	100.0	ASTM D-445
	@ 100°C	mm2/s	6.35	8.20	11.10	14.80	ASTM D-445
Viscosity Index		-	155	155	155	155	ASTM D-2270
Flash Point	COC	°C	205	214	218	220	ASTM D-92
Pour Point		°C	-42	-39	-36	-33	ASTM D-97
TAN		mg KOH/ gm	0.40	0.40	0.40	0.40	ASTM D-974
Color		-	0.5	0.5	1.0	1.0	ASTM D-1500

GII TURBINE OIL
32, 46, 68, 77, 100

DESCRIPTION

GII TURBINE OIL is a premium quality, highly refined Group II base oils which is further enhanced by the addition of oxidation inhibitors together with specially selected additives that give effective deposit control and keep the system clean. These inhibitors provide resistance to thermal degradation over long periods of time in the presence of entrained air and catalyzing metals. GII TURBINE OIL exhibits good demulsibility, permitting water and other contaminants to readily separate from oil in the system reservoir.

APPLICATONS

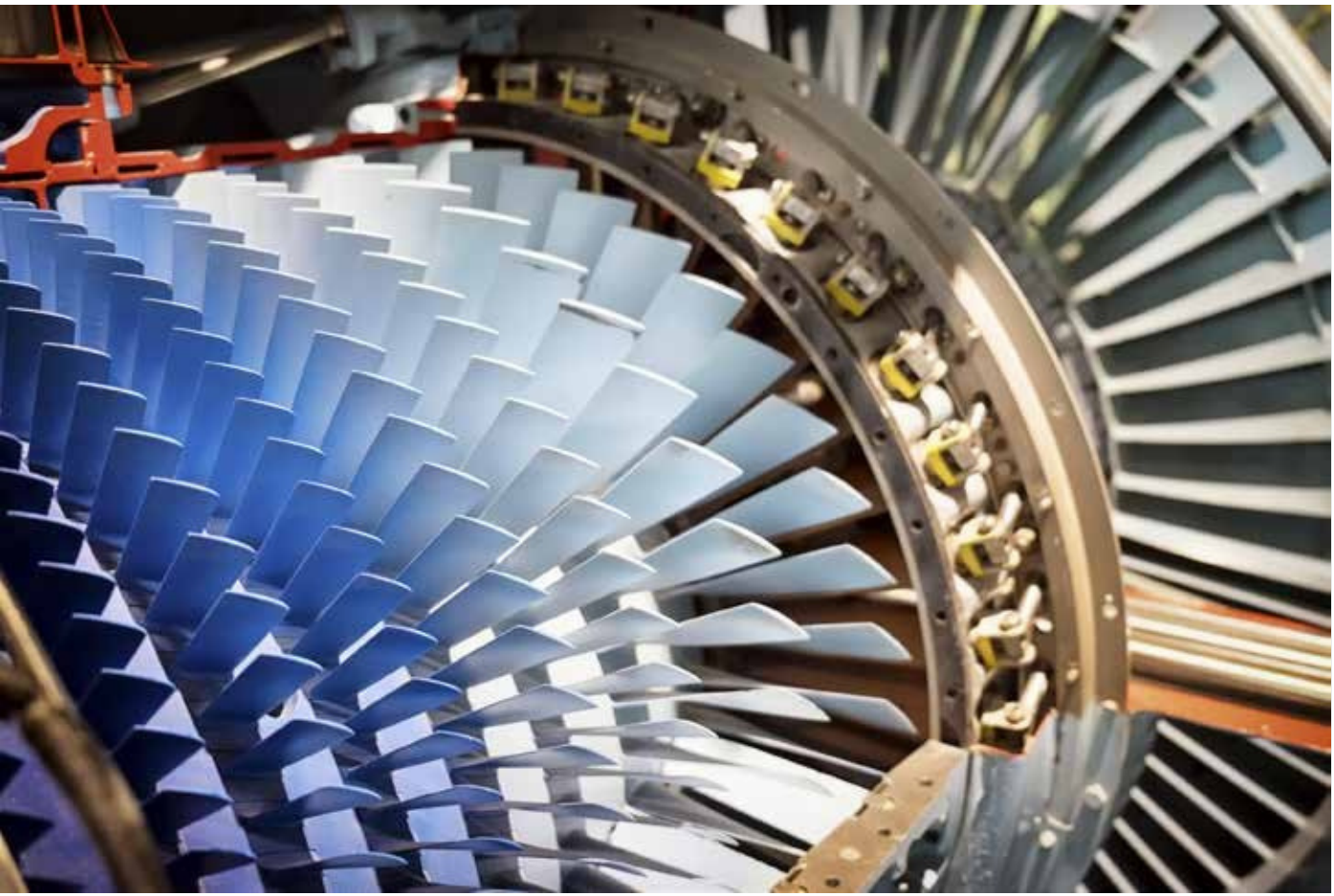
GII TURBINE OIL is designed for use in water, steam and gas turbines, bearing lubrication and system cooling where oil requirements include a long operating life and rust protection, good water separation and air release characteristics. It is also suited for high speed gear units and other applications requiring high quality rust and oxidation inhibited type oil. In addition, this oil find application in circulating systems, anti-friction bearings, enclosed gears, hydraulic units, compressor crankcases and many other applications requiring extended service lubrication.

BENEFITS

- Excellent oxidation stability.
- Effective protection against air entrainment and good air release
- properties.
  Protection against rust/corrosion for long
- period.
  Efficient demulsibility for rapid separation of water.

PERFORMANCE LEVEL

BS 489,
DIN 51515 (Par I & II),
ALSTOM HTGD 90117,
GEK 27070,28143A & 46506D & 32568F
Siemens TLV 901304 & TLV 901305.



PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE					TEST METHOD
Grade		-	32	46	68	77	100	-
Specific Gravity	@ 15°C	-	0.8565	0.8595	0.8560	0.8630	0.8655	ASTM D-1298
Viscosity	@ 40°C	mm2/s	31.00	45.00	68.00	77.00	100.0	ASTM D-445
	@ 100°C	mm2/s	5.35	6.85	8.90	9.75	11.30	ASTM D-445
Viscosity Index		-	105	105	105	105	98	ASTM D-2270
Flash Point	COC	°C	214	220	230	232	240	ASTM D-92
Pour Point		°C	-15	-15	-15	-15	-9	ASTM D-97
TAN		mg KOH/g	0.10	0.10	0.10	0.10	0.10	ASTM D-974
Color		-	L0.5	0.5	L1.0	1.0	1.5	ASTM D-1500

ADCO LUBE

GREASES

GREASE
NO. 0, 1, 2, 3 & MP

DESCRIPTION

GREASE NO. 0, 1, 2, 3 and MP are general purpose Lithium soap greases specifically formulated to provide effective oxidation resistance, rust and corrosion protection. The use of Lithium soap in these greases provides excellent structural stability throughout their recommended temperature range. They possess high chemical stability, resistance to thermal breakdown and deterioration. They also resist water washing.

APPLICATIONS

GREASE NO. 0, 1, 2, 3 and MP are recommended for lubrication of rolling element and needle bearings. The heavier consistency is preferred for vertical shaft and outer race rotating applications. They are suitable for use under either wet or dry conditions.
These products are also recommended for the lubrication of plain bearings, cams, ways and other sliding parts when loads are normal and no stock loads are experienced. They may also be used in moderate automotive wheel bearing and chassis service.

BENEFITS

- Wide range of usable temperature.
- Protection against rust and corrosion.
- Resistance to water-washing and wet conditions.
- Good dispensing characteristics.

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE					TEST METHOD
NLGI Grade		-	0	1	2	3	MP	-
Color		-	Brown					Visual
Texture		-	Smooth					Visual
Thickener Type		-	Lithium Soap					-
Mineral Oil	@ 40°C	mm2/s	220	220	220	220	220	ASTM D-445
	@ 100°C	mm2/s	16	16	16	16	16	ASTM D-445
Dropping Point	(min)	°C	185	190	197	200	197	ASTM D-2265
Worked Penetration	@ 25°C	mm/10	370	325	280	235	280	ASTM D-217
Oil Separation, mass%		%mass	-	3	2	2	2	ASTM D-1742
Operating Temp		°C	-20°C up to +100°C	-20°C up to +110°C	-20°C up to+125°C	-20°C up to +130°C	-20°C up to +125°C	-

GREASE
EP 0, 1, 2, 3

DESCRIPTION

GREASE EP is an extreme pressure Lithium soap grease that contains oxidation, rust and corrosion inhibitors and provides excellent EP properties. The use of a lithium soap base ensures effective resistance to softening under severe working conditions, efficient water resistance and a consistency which remains relatively constant over the recommended range of operating temperatures. GREASE EP is non-corrosive to both steel and copper.
The grease exhibits effective resistance to bleeding and superior resistance to water wash out.

APPLICATIONS

Grease EP is recommended for lubrication of plain and rolling element bearings in normal through heavy-duty industrial applications. It is suitable where loads are high or shock loads are present. It resists water washing and provides rust protection for bearings if water is present. The softer grades are particularly suitable for use in centralized lubrication system and can be used for both automotive and industrial applications.

BENEFITS

- Superior lubrication under heavy and shock loading.
- Excellent load carrying ability.
- Excellent resistance to water washing.
- Effective rust protection and corrosion resistance.

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE				TEST METHOD
NLGI Grade		-	0	1	2	3	-
Color		-	Brown				Visual
Texture		-	Smooth				Visual
Thickener Type		-	Lithium Soap				-
Mineral Oil	@ 40°C	mm2/s	219	219	219	219	ASTM D-445
	@ 100°C	mm2/s	19	19	19	19	ASTM D-445
Dropping Point	(min)	°C	180	190	197	200	ASTM D-2265
Worked Penetration	@ 25°C	mm/10	370	325	280	235	ASTM D-217
Oil Separation, mass%		%mass	-	3	2	2	ASTM D-1742
Operating Temp		°C	-20°C up to +100°C	-20°C up to +110°C	-20°C up to +125°C	-20°C up to +130°C	-
Four Ball Welding Load		Kg	-	>270	>270	>270	ASTM D-2596

GREASE LX EP2

DESCRIPTION

GREASE LX EP2 is a premium Lithium complex industrial and automotive lubricating grease for plain and anti-friction bearings. LX EP is shear and oxidation stable, provides protection against rust and oxidation while resisting softening at higher temperatures.

APPLICATIONS

GREASE LX EP2 is primarily designed for the lubrication of steel roll mill bearings. This grease is ideal for the lubrication of bearings used in industry under high operating temperatures (operating temperatures can vary between -20°C to +180°C).
GREASE LX EP2 can be used in automotive wheel bearings of vehicles subjected to occasional high temperature which may occur in vehicles with disc brakes.

BENEFITS

- Longer life at higher temperatures.
- Shear and oxidation stable.
- Excellent wear protection.
- Resists softening at elevated temperatures.
- Wide application range.
- Protection against rust and corrosion.
- Resistance to water-washing and wet conditions.

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE	TEST METHOD
NLGI Grade		-	2	-
Color		-	Green	Visual
Texture		-	Smooth	Visual
Thickener Type		-	Lithium Soap	-
Mineral Oil	@ 40°C	mm2/s	240	ASTM D-445
	@ 100°C	mm2/s	20	ASTM D-445
Dropping Point	(min)	°C	265	ASTM D-2265
Worked Penetration	@ 25°C	mm/10	280	ASTM D-217
Oil Separation, mass%		%mass	2	ASTM D-1742
Operating Temp		°C	-20°C up to +160°C	-
Four Ball Welding Load			>270	ASTM D-2596

GREASE LX2

DESCRIPTION

GREASE LX2 is Lithium complex industrial and automotive lubricating grease. It provides protection against rust and oxidation while resisting softening at higher temperature.

APPLICATIONS

GREASE LX2 can be used in automotive wheel bearings of vehicles subjected to occasional high temperature which may occur in vehicles with disc brakes. It is ideal for the lubrication of bearings used in industry under high operating temperatures. Operating temperatures can vary between -20°C to +180°C.

BENEFITS

- Longer life at higher temperatures.
- Resists softening at elevated temperatures.
- Wide application range.
- Protection against rust and corrosion.
- Resistance to water-washing and wet conditions.

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE	TEST METHOD
NLGI Grade		-	2	-
Color		-	Green	Visual
Texture		-	Smooth	Visual
Thickener Type		-	Lithium Soap	-
Mineral Oil	@ 40°C	mm2/s	190	ASTM D-445
	@ 100°C	mm2/s	17.0	ASTM D-445
Dropping Point Worked	(min)	°C	265	ASTM D-2265
Penetration	@ 25°C	mm/10	280	ASTM D-217
Oil Separation, mass%		%mass	2	ASTM D-1742
Operating Temp		°C	-20°C up to +160°C	-

MP GREASE MOLY

DESCRIPTION

MP GREASE MOLY is a Lithium based grease containing special chemical additives that enhance oxidation resistance and rust protection.
MP GREASE MOLY is suitable for equipment operating under slow-speed/high-load conditions. It has resistance against softening under severe working conditions, good water resistance and consistency which remains relatively constant over the recommended operating temperature range.

APPLICATIONS

MP GREASE MOLY is recommended for automotive and industrial applications where equipment is highly loaded and operates at slow speed. It is good for automotive chassis and bearing applications in cars, vans, trucks, mining, construction vehicles and tractors, especially those operating in dusty or wet areas.

BENEFITS

- Long service life.
- Resistant to water washing.
- Good dispensing characteristics.
- Protection against rust and corrosion.
- Excellent wear protection.

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE	TEST METHOD
NLGI Grade		-	2	-
Color		-	Metallic Gray	Visual
Texture		-	Smooth	Visual
Thickener Type		-	Lithium Soap	-
Mineral Oil	@ 40°C	mm2/s	220	ASTM D-445
	@ 100°C	mm2/s	16	ASTM D-445
Dropping Point	(min)	°C	197	ASTM D-2265
Worked Penetration	@ 25°C	mm/10	280	ASTM D-217
Oil Separation, mass%		%mass	2	ASTM D-1742
Operating Temp		°C	-20°C up to +125°C	-
Four Ball Welding Load			>270	ASTM D-2596

EP GREASE MOLY

DESCRIPTION

EP GREASE MOLY is a Lithium based grease containing special chemical additives that enhance oxidation resistance and rust protection and provide extreme pressure protection. EP GREASE MOLY forms an adhering film on metallic surfaces to provide additional protection against scoring. This makes the grease especially suitable for equipment operating under slow speed-high load conditions. It ensures effective resistance against softening under severe working conditions, good water resistance and consistency which remains relatively constant over the recommended operating temperature range.

APPLICATIONS

EP GREASE MOLY is recommended for automotive and industrial applications where equipment is highly loaded and operates at slow speed. It is good for automotive chassis and bearing applications in cars, vans, trucks, mining, construction vehicles and tractors, especially those operating in dusty or wet areas.

BENEFITS

- Excellent wear protection.
- Excellent load carrying ability.
- Effective retention under shock load conditions.
- Long service life.
- Resistant to water washing.
- Good dispensing characteristics.
- Protection against rust and corrosion.

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE	TEST METHOD
NLGI Grade		-	2	-
Color		-	Metallic Gray	Visual
Texture		-	Smooth	Visual
Thickener Type		-	Lithium Soap	-
Mineral Oil	@ 40°C	mm2/s	219	ASTM D-445
	@ 100°C	mm2/s	19	ASTM D-445
Dropping Point	(min)	°C	197	ASTM D-2265
Worked Penetration	@ 25°C	mm/10	280	ASTM D-217
Oil Separation, mass%		%mass	2	ASTM D-1742
Operating Temp		°C	-20°C up to +125°C	-
Four Ball Welding Load			>270	ASTM D-2596

MARINE LUBRICANTS

ADCO MARINE 306

DESCRIPTION

ADCO MARINE 306 is a high quality marine system oil, formulated from high quality solvent –refined paraffin base oils and premium quality additive package. It has been developed specifically for use as system oil in modern high-output cross-head type marine diesel engines. It provides adequate lubrication for bearings and other moving parts, including cams and gears, and effective cooling of pistons in cross-head engines even in the presence of saline water.

APPLICATIONS

ADCO MARINE 306 is recommended primarily for use in high-output cross-head diesel engines in marine service particularly those requiring system oil for piston cooling. In these applications it will prevent or reduce deposit formation in piston cooling spaces, maintain piston- cooling efficiency and reduce the incidence of piston crown cracking. It is also recommended as crankcase oil in auxiliary engines.

BENEFITS

- Reduce deposits on piston and crankcase
- surfaces. Enhance piston-cooling efficiency.
- Increase protection against bearing corrosion.
- Provide improved rust protection.
- Provide effective water tolerance and separation.

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE	TEST METHOD
Product		-	306	-
Specific Gravity	@ 15°C	-	0.8940	ASTM D-1298
Viscosity	@ 40°C	mm2/s	111.0	ASTM D-445
	@ 100°C	mm2/s	11.90	ASTM D-445
Viscosity Index		-	95	ASTM D-2270
Flash Point	COC	°C	235	ASTM D-92
Pour Point		°C	-12	ASTM D-97
Base Number		mg KOH/g	5.3	ASTM D-2896
Color		-	3.0	ASTM D-1500

ADCO MARINE 312, 412

DESCRIPTION

ADCO MARINE 312, 412 are high performance trunk piston engine oils for medium speed marine. They are blended using solvent-refined high viscosity index paraffin mineral base oil with chemical additive which provide effective alkalinity, wear resistance, detergent/dispersant and water separating properties.

APPLICATIONS

ADCO MARINE 312, 412 are recommended for crankcase lubrication in medium-speed marine type diesel engines. They can also be used to separate bearing lubrication and piston cooling of large cross-head type engines under severe service conditions at appropriate viscosity grades.

BENEFITS

- Improved anti-wear properties, reduces ring and liner wear.
- Reduces port and under crown deposits.
- Cleaner engine operation.
- Increased protection against cylinder and bearing wear.
- Outstanding thermal and oxidation stability over extended periods.
- Controls black sludge deposits.

PERFORMANCE LEVEL

API ..... CF

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE		TEST METHOD
Product		-	312	412	-
Specific Gravity	@ 15°C	-	0.8960	0.9005	ASTM D-1298
Viscosity	@ 40°C	mm2/s	107.0	142.0	ASTM D-445
	@ 100°C	mm2/s	11.60	14.0	ASTM D-445
Viscosity Index		-	95	95	ASTM D-2270
Flash Point	COC	°C	240	250	ASTM D-92
Pour Point		°C	-18	-15	ASTM D-97
Base Number		mg KOH/g	12.3	12.3	ASTM D-2896
Color		-	3.5	4.0	ASTM D-1500

ADCO MARINE 430

DESCRIPTION

ADCO MARINE 430 is a trunk piston Engine Oil for crankcase lubrication requirements of high-output medium speed engines and other similar marine type application.
It is formulated from high quality solvent-refined paraffin base oils, combined with an effective additive package providing enhanced load-carrying ability, efficient oxidation stability and effective dispersancy/detergency. It provides effective acid neutralization and alkalinity retention in service, even when high sulphur fuel is used.

APPLICATIONS

ADCO MARINE 430 is primarily recommended for use in high-output trunk piston marine diesel engines operating on heavy residual fuels. It is suitable for four-stroke medium speed diesel engines.

BENEFITS

- Excellent TBN retention, with low oil consumption.
- Cleaner piston, ports and cylinders.
- Low piston under crown deposits.
- Control sludge formation.
- Fast separation from water in case of water contamination.

PERFORMANCE LEVEL

API ..... CF

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE	TEST METHOD
Product		-	430	-
Specific Gravity	@ 15°C	-	0.9110	ASTM D-1298
Viscosity	@ 40°C	mm2/s	142.0	ASTM D-445
	@ 100°C	mm2/s	14.0	ASTM D-445
Viscosity Index		-	95	ASTM D-2270
Flash Point	COC	°C	250	ASTM D-92
Pour Point		°C	-15	ASTM D-97
Base Number		mg KOH/g	30	ASTM D-2896
Color		-	6.0	ASTM D-1500

ADCO MARINE 440

DESCRIPTION

ADCO MARINE 440 is a highly alkaline trunk piston engine oil for crankcase and cylinder lubrication requirement of cross-head type marine engine burning high sulphur residual fuels. It is a combination of high quality base oils and additives designed to impart acid neutralization, detergent, dispersant properties and oxidation stability.

APPLICATIONS

ADCO MARINE 440 is recommended for use in high-output trunk piston marine diesel engines operating on heavy residual fuels. It is suitable for four stroke medium speed diesel engines.

BENEFITS

- Excellent TBN retention, with low oil consumption.
- Low cylinder wear rate.
- Cleaner piston, ports and cylinder.
- Fast separation from water in case of water contamination.
- Low under crown deposits.
- Control sludge formation.

PERFORMANCE LEVEL

API ..... CF

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE	TEST METHOD
Product		-	440	-
Specific Gravity	@ 15°C	-	0.9120	ASTM D-1298
Viscosity	@ 40°C	mm2/s	142.0	ASTM D-445
	@ 100°C	mm2/s	14.0	ASTM D-445
Viscosity Index		-	95	ASTM D-2270
Flash Point	COC	°C	250	ASTM D-92
Pour Point		°C	-15	ASTM D-97
Base Number		mg KOH/g	40	ASTM D-2896
Color		-	2 Dil	ASTM D-1500

ADCO MARINE 450

DESCRIPTION

ADCO MARINE 450 is a highly alkaline trunk piston engine oil for crankcase and cylinder lubrication requirement of medium-speed marine engines burning high sulphur residual fuels. It is a combination of high quality base oils and additives designed to impart acid neutralization, detergent, dispersant properties and oxidation stability.

APPLICATIONS

ADCO MARINE 450 is recommended as crankcase engine oil for medium speed engines operating on high sulfur fuels.

BENEFITS

- Excellent TBN retention with low oil consumption.
- Cleaner piston, ports and cylinder.
- Fast separation from water in case of water contamination.
- Extend oil life and drain intervals.
- Low under crown deposits.
- Control sludge formation.

PERFORMANCE LEVEL

API ..... CF

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE	TEST METHOD
Product		-	450	-
Specific Gravity	@ 15°C	-	0.9030	ASTM D-1298
Viscosity	@ 40°C	mm2/s	142.0	ASTM D-445
	@ 100°C	mm2/s	14.0	ASTM D-445
Viscosity Index		-	95	ASTM D-2270
Flash Point	COC	°C	260	ASTM D-92
Pour Point		°C	-9	ASTM D-97
Base Number		mg KOH/g	50	ASTM D-2896
Color		-	3.5Dil	ASTM D-1500

ADCO MARINE 570

DESCRIPTION

ADCO MARINE 570 is a superior high-alkaline product designed for the cylinder lubrication of crosshead engines, developed for lubrication of modern, high output cross-head type engines using high sulphur fuels. It is formulated from high-quality base stocks with selected additives to provide optimum oxidation resistance at high temperatures. It also provides high level of detergency, alkalinity and load-carrying ability.

APPLICATIONS

ADCO MARINE 570 is recommended as a cylinder lubricants for all types of slow speed cross-head two-stroke diesel engines using high sulphur fuels.

BENEFITS

- Reduce engine wear rates.
- Good demulsibility properties.
- Extended oil life and reduced maintenance costs.

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE	TEST METHOD
Product		-	570	-
Specific Gravity	@ 15°C	-	0.9040	ASTM D-1298
Viscosity	@ 40°C	mm2/s	260.0	ASTM D-445
	@ 100°C	mm2/s	20.90	ASTM D-445
Viscosity Index		-	95	ASTM D-2270
Flash Point	COC	°C	250	ASTM D-92
Pour Point		°C	-9	ASTM D-97
Base Number		mg KOH/g	70	ASTM D-2896
Color		-	4.5Dil	ASTM D-1500

STERN TUBE LUBE 150

DESCRIPTION

STERN TUBE LUBE 150 is high quality oil formulated from paraffinic high viscosity index oils and Super quality additives with lubricity agent and non-ionic emulsifier.

APPLICATIONS

STERN TUBE LUBE 150 is used in lubrication of horseshoe thrust bearings and stern tube bearings requiring an emulsion-type oil. It is also a steam engine bearing lubricant that provides excellent lubrication under wet conditions prevailing in open-frame type of reciprocating steam engines and it is particularly suitable for lubrication of bearings, guides and journals.

BENEFITS

- Long lasting emulsion.
- Rust protection.
- Rapid and even spreading, with good adhesion to metal surfaces.
- Uniform wick-feeding at low feed rates.
- Unaffected by prolonged storage or climatic conditions.
- Good oxidation stability.

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE	TEST METHOD
Viscosity	@ 40°C	cSt	158	ASTM D-445
Pour Point		°C	-9	ASTM D-97
Saponification Number		mgKOH/g	1.9	ASTM D-94
Emulsion	@ 54°C for one Hour	ml	PASS*	ASTM D-140

**According to FTMS 791.B/3201.6. PASS indicates that oil shall remain emulsified at the end of 60 minutes, with maximum allowable 2 ml of free water*

ADCO
LUBE

BRAKE FLUIDS

BRAKE FLUID DOT3, DOT4

DESCRIPTION

BRAKE FLUID DOT3, DOT4 are formulated as non-petroleum chemical fluids for use in the hydraulic brake and clutch system of automotive vehicles. They possess high boiling points and low pour points. They do not affect natural or synthetic rubber washers. They offer protection against corrosion and rusting of metal parts.

APPLICATIONS

BRAKE FLUID DOT3 and DOT4 are suitable for all hydraulic brake and clutch, disc and drum systems where such type of fluid is specified.

BENEFITS

- Compatible with other brands meeting similar specifications.
- Good protection against corrosion and rust.

PERFORMANCE LEVEL

FMVSS116 DOT3; DOT4
SAE J 1704

PRODUCT TYPICAL CHARACTERISTICS

PROPERTIES		UNITS	VALUE		TEST METHOD
Grade		-	DOT 3	DOT 4	-
ERBP		°C	245	260	ASTM D-1120
PH		-	10.0	8.25	ASTM D-1287
Viscosity	@ 100°C	mm2/s	2.060	2.105	ASTM D-445
Specific Gravity	@ 20°C		1.0340	1.0397	ASTM D-1298
Color		-	Yellowish	Yellowish	Visual

ADCO
LUBE

APPENDICES

APPENDICES

API CLASSIFICATION SYSTEM

The API Engine Service Classification system currently includes twentythree classes of service; eleven for service station (S series) and twelve for commercial application (C series). It is an 'open ended' system, which allows the addition of new designations without changing or deleting existing ones.

"S" SERVICE CLASSIFICATION FOR GASOLINE

SA formerly for Utility Gasoline and Diesel Engine Service.
Service typical of older engines operated under such mild conditions that the protection afforded by compound oils is not required. This classification has no performance requirements and oils in this category should not be used in any engine unless specifically recommended by the equipment manufacturer.

SB for Minimum Duty Gasoline Engine Service.
Service typical of older engines operated under such mild conditions that only minimum protection afforded by compounding is desired. Oils designed for this service have been used since the 1930's and provided only anti-scuff capability and resistance to oil oxidation and bearing corrosion. They should not be used in any engine unless specifically recommended by the equipment manufacturer.

SC for 1964 Gasoline Engine Warranty Maintenance Service.
Service typical of gasoline engines in 1964 through 1967 models of passenger cars and some trucks operating under engine manufacturers' warranties in effect during those years model oils designed for this service provide control of high and low temperature deposits, wear, rust and corrosion in gasoline engines.

SD for 1968 Gasoline Engine Warranty Maintenance Service.
Service typical of gasoline engines in 1968 through 1970 models of passenger cars and some trucks operating under engine manufacturers' warranties in effect during those years model oils It also may apply to certain 1971 and/or later models as specified (or recommended) in the owner's manuals. Oils designed for this service provide more protection against high

and low-temperature engine deposits, wear, rust and corrosion in gasoline engines, than oils which are satisfactory for API Engine Service Classification SC and may be used when API Engine Service Classification SC is recommended.

SE for 1972 Gasoline Engine Warranty Maintenance Service.

Service typical of gasoline engines in passenger cars and some trucks beginning with 1972 models and certain 1971 models operating under engine manufacturers warranties. Oils designed for this service provide more protection against oil oxidation, high-temperature engine deposits, rust and corrosion in gasoline engines, than oils which are satisfactory for API Engine Service Classification SD or SC and may be used when either of these classification is recommended.

SF for 1980 Gasoline Engine Warranty Maintenance service.

Service typical of gasoline engines in passenger cars and some trucks beginning with 1980 models operating under engine manufacturers' recommended maintenance procedures. Oils developed for this service provide increased oxidation stability and improved anti-wear performance relative to oils which meet the minimum requirements to API Service Category SE. These oils also provide protection against engine deposits, rust and corrosion. Oils meeting API Service Category SF may be used where API Service Categories SE, SD, or SC are recommended.

NOTE:
API Internationally omitted "SI" and "SK" from the sequence of categories.

SG for 1989 Gasoline Engine Warranty Maintenance Service.

The Category SG denotes service typical of gasoline engines in passenger cars, vans and light trucks beginning with 1989 model year operating under engine manufacturers' recommended maintenance procedures. Category SG quality oils include the performance properties of API Service Category CC. (Certain manufactures of gasoline engine require oils also meeting API Service Category CD). Oils developed for this service provide improved control of engine deposits,
oil oxidation, and engine wear relative to oils developed for previous categories. These oils also provide protection against rust and corrosion. Oils meeting API Service Category SG may be used where API Service Categories SF, SE, SF/CC or SE/CC are recommended.

SH for 1994 Gasoline Engine Warranty Maintenance Service.

The Category SH denotes service typical of gasoline engines and earlier passenger cars, vans and light trucks operation under vehicle manufacturer recommended maintenance procedures. Engine oils developed for this category provide performance exceeding the minimum performance requirements for API SG, which it is intended to replace, in the areas of deposit control, oil oxidation, wear, rust
and corrosion. Engine oils meeting the API SH designation have been tested according to the Chemical Manufacturers Association (CMA) Product approval Code of Practice, may utilize the API Base oil interchange and Viscosity Grade Engine Testing Guidelines and may
be used where API Service Category SG and earlier categories have been recommended.

SJ for 1997 Gasoline Engine Warranty Maintenance Service.

API Service Category SJ was adopted for use in describing engine oils available in 1996. These oils are for use in service typical of gasoline engines in current and earlier passenger-car, sport utility vehicle, van, and light truck operations under vehicle manufacturers' recommended maintenance procedures. Engine oils that meet the API Service Category SJ designation may be used where API Service Category SH and earlier Categories have been recommended.

SL for 2001 Gasoline Engine Warranty Service.

API Service Category SL was adopted for all automotive engines presently in use. Introduced on 1st July, 2001, SL oils are designed to provide better high-temperature deposit control and lower oil consumption. Some of these oils may also meet the latest ILSAC specification and/or quality as Energy Conserving. Engine oils that meet the APIService Category SL designation may be used where API Service Category SJ and earlier Categories have been recommended.

SM for 2005 Gasoline Engine Warranty Service.

API Service Category SM was adopted for describing engine oils available in 2004. These oils are for use in service of gasoline engines in current and earlier passenger cars, Sport Utility Vehicles, vans and light duty trucks operating under vehicle manufacturer's recommended procedures. Engine oils that meet the API Service Category SM designation may be used where API Service Category SL and earlier Categories have been recommended.

SN Introduced in October 2010.

Introduced in October 2010 for 2011and older vehicles, designed to provide improved high temperature deposit protection for pistons, more stringent sludge control, and seal compatibility. API SN with Resource Conserving matches ILSAC GF-5 by combining API SN performance with improved fuel economy, turbocharger protection, emission control

system compatibility, and protection of engines operating on ethanol-containing fuels up to E85.

“C“ COMMERCIAL CLASSIFICATION FOR DIESEL

CA for light Duty Diesel Engine Service.

Service typical of diesel engines operated in mild to moderate duty with high-quality fuels and occasionally has included gasoline engines in mild service. They were widely used in the
late 1940’s but should not be used in any engine unless specifically recommended by the equipment manufacturer.

CB for Moderate Duty Diesel Engine Service.

Service typical of diesel engines operated in mild to moderate duty with lower-quality fuels which necessitate more protection from wear and deposits. Oils designed for this service were introduced in 1949.

CC for Moderate Duty Diesel and Gasoline Engine Service.

Service typical of certain naturally aspirated turbocharged or supercharged diesel engines operated in moderate to severe-duty service and certain heavy-duty gasoline engines. Oils designed for this service provide protection from high-temperature deposits and bearing corrosion in these diesel engines and also from rust, corrosion and low-temperature deposits in gasoline engines. These oils were introduced in 1961.

CD for severe Duty Diesel Engine Service.

Service typical of certain naturally-aspirated, turbocharged or supercharged diesel engines where highly effective control of wear and deposits is vital, or when using fuels of a wide quality range including high-sulphur fuels. Oils designed for this service were introduced in 1955 and provide protection from bearing corrosion and from high-temperature deposits in these diesel engines.

CD-II severe Duty Two-Stroke Cycle Diesel Engine Service.

Service typical of two-stroke cycle diesel engines requiring highly effective control over wear and deposits. Oils designed to this service also meet all performance requirement of API Service Category CD.

CE for Severe Duty Turbocharged or Supercharge Diesel Engine Service.

Service typical or turbocharged or supercharged diesel engines manufactured since 1983 and operated under both low-speed, high-load & high speed high-load conditions.
Oils designed for this service may also be used when previous API engine service categories for diesel engines are recommended.

CF - Indirect-injected Diesel Engine Service.

Service typical of indirect-injected diesel engines and other diesel engines that use a broad range of fuel types, including those using

fuel with high sulphur content; for example, over 0.5% wt. Effective control of piston deposits, wear and copper containing bearing corrosion is essential for these engines, which may be naturally aspirated, turbocharged or supercharged. Oils designated for this service have been in existence since 1994 and may be used when API Service Category CD is recommended.

CF-2-Severe-Duty Two-Stroke Cycle Diesel Engine Service.
Service typical of two-stroke cycle diesel engines requiring highly effective control over cylinder and ring-face scuffing and deposits. Oils designed to this service have been in existence since 1994 and may also be used when API Engine Service Category CD-II is recommended. These Oils do not necessarily meet the requirements of API CF or CF-4 unless they pass the test requirements for these categories.

CF-4 -1990 Diesel Engine Service.
Describes oils for use in high-speed, four-stroke-cycle, diesel engines, API CF-4 oils exceed the requirements for the CE category providing improved control of oil consumption and piston deposits. These oils should be used in place of CE oils. They are particularly suited for on-high way, heavy-duty truck applications.

CG-4 -1994 Severe Duty Diesel Engine Service. API Service Category CG-4 describes oils
for use in high-speed four stroke-cycle diesel engines used in both heavy-duty on-highway (0.05% wtsulphur fuel) and off-highway (less than 0.5% wtsulphur fuel) applications. CG-4 oils provide effective control over high-temperature piston deposits, wear, corrosion, foaming, oxidation stability, and soot accumulation. These oils are especially effective in engines designed to meet 1994 exhaust emission standards and may also be used in engines requiring API Service Categories CD, CE and CF-4. Oils designed for this service have been in existence since 1994.

CH-4 -1998 Severe Duty Diesel Engine Service.
API Service Category CH-4 describes oils for use in high-speed, four-stoke diesel engines designed to meet 1998 exhaust emissions standards as well as for previous model years. CH-4 oils are specifically compounded for use with diesel fuels ranging in sulphur content up to 0.5 percent weight.

CI-4 -2002 Severe Duty Diesel Engine Service.
API Service Category CI-4 introduced on 5th September, 2002 for high-speed four-stroke engines designed to meet 2004 exhaust emission standards implemented in 2002. CI-4 oils are formulated to sustain engine durability where exhaust gas recirculation (EGR) is used and are not intended for use with diesel fuels ranging in sulphur content up to 0.5% weight. Can be used in place of CD, CE, CF-4, CG-4 and CH-4 oils.

CI-4 Plus-2004 Severe Duty Diesel Engine Service.
CI-4 Plus introduced on 1st September, 2004, formulated to provide a higher level of protection against soot-related viscosity increase & viscosity loss due to shear in vehicles powered by diesel engines CI-4 Plus oils are superior in performance to those meeting API CI-4, CH-4 CG-4 & CF-4 and can effectively lubricate engines calling for those API service categories.

CJ-4 -2006 Severe Duty Diesel Engine Service.

The API CJ-4 requirements describe oils for use in those high-speed four stroke cycle diesel engines designed to meet the on-highway exhaust emission standards being implemented for 2007 model year as well as for previous model years. These oils are compounded for use in all applications with diesel fuel ranging in sulphur content up to 500 ppm (0.05% by weight) However, the use of these oils with greater than 15 ppm (0.0015% by weight) sulphur fuel may impact aftertreatment system durability and/or oil drain interval.

API CJ-4 oils exceed the performance criteria of API CI-4, CI-4 PLUS, CH-4, CG-4 and CF-4 and can effectively lubricate engines calling for those API Service Categories.

GEAR OIL CLASSIFICATION

API GL-1 - Specified for some manual transmissions.
No friction modifiers or EP additive permitted.
API GL-2 - Worm gears - Industrial oils.
API GL-3 - Manual transmissions/moderately loaded spiral bevel axles.
API GL-4 - Spiral bevel drive axles, light duty hypoid, manual transmissions and European transaxles.
API GL-5 - Hypoid drive axles. Equivalent to MIL-L-2105C.
API GL-6 - Passenger car (hypoid axles height offset)

TABLE 1-2 (CURRENT & PREVIOUS API DESIGNATION)

CURRENT API SERVICE CLASSIFICATION	PREVIOUS API SERVICE CLASSIFICATION	RELATED DESIGNATION MILITARY AND INDUSTRY
SERVICE STATION ENGINE SERVICE		
SA	ML	Straight mineral oil. Can have pour and foam
SB	MM	depressants. Anti-wear-inhibited
SC	MS(1964-67)	1964 MS warranty approved: Ford M2C101-A;GM4745-M
SD	MS(1968-71)	1968 MS warranty approved; Ford M2C101-B;GM 6041-M
(before July 1970)		
SE	None	1972 warranty approved; Ford M2C101-C M2C153-A & M2V157-A GM6136-M(SE) & 6146-M (SE/CC & SE/CD)
SF	None	1980 warranty approved; Ford M2C153-C; GM 6048-M(SF) & 6049-M (SF/CC) & GM 6085-M (SF/CC & SF/CD)
SG	None	1989 warranty approved
SH	None	1994 warranty approved
SJ	None	1997 warranty approved
SL	None	2004 and older automotive engines
SM	None	2005 and older automotive engines.
SN	None	2011 and older automotive engines.
COMMERCIAL & FLEET ENGINE SERVICE		
CA	DG	MIL-L-2104A
CB	DM	Supplement 1
CC	DM	MIL-L-2104B (SC/CC)
CD	DS	MIL-L-45199B; Series 3; MIL-L 2104C (CD & SC); MIL-L-2104D (CD/SE)
CE	None	API CD, Mack EO-K/2, Cummins NTC 400
CF-4	None	For severe duty four stroke cycle diesel/engine service since 1/1/1991
CF-2	None	For service typical of modern two stroke engines manufactured since 1994.
CF	None	Suitable for severe duty in naturally aspirated, turbocharged and super charged diesel engines with high sulphur fuels.
CG-4	None	For engines which were designed to meet 1994 US emission legislations suitable for modern turbocharged or supercharged heavy duty engines.
CH-4	None	For engines which were to meet 1998 exhaust emission standards as well as for previous model years. Specifically compounded for use with diesel fuels ranging in sulphur content up to 0.5 percent weight.
CI-4	None	For engines to meet 2004 emission requirement.
CI-4 PLUS	None	These oils provide better protection against soot related viscosity increase, viscosity loss due to shear in diesel vehicles.
CJ4	None	For engines to meet 2007 model year on-highway exhaust emission standards

U.S. MILITARY CLASSIFICATION

MIL-L-2104A - Obsolete specification for crankcase oils. Required performance in the L-1 diesel engine test and the L-4 gasoline test.

MIL-L-2104A (Supplements 1) - obsolete specification for crankcase oils. Same engine tests as MIL-L2104A, but performance requirement made stricter by using higher sulphur fuel in the diesel engine test.

MIL-L-2104B - Obsolete Specification for crankcase oils for general duty service. Required performance in the 1-H, L-38 and LTD engine tests.

MIL-L-2104C - Obsolete specification for crankcase oils for service in tactical military vehicles. Equivalent to API Service CD in diesel performance and API Service SC to SD in gasoline engine performance.

MIL-L-2104D - Obsolete specification for crankcase oils for service in tactical military vehicles. Equivalent to API Service CD in diesel performance and API Service SD to SE in gasoline engine performance. MIL-L2104D replaced MIL-L2104C and represents higher performance criteria. It is indicated in most cases API-CD/SE level.

MIL-L-2104E - Current specification for crankcase oils for service in tactical military vehicles. Equivalent to API Service CD-II in diesel performance and, while exceeding API Service SF in gasoline engine performance, does not quite match API Service SG performance level.

MIL-L-2105 - Obsolete specification for multi-purpose gear lubricants. Required performance at a level equivalent to API Service GL-4.

MIL-L-2105B - Obsolete specification for multi-purpose automotive gear lubricants. Required performance in the L-37 and L-42 gear tests and L-33 moisture corrosion test Equivalent to API Service GL-5.

MIL-L-2105C - Current specification for multi-purpose automotive gear lubricants. Same performance requirements as MIL-L2105B but covers SAE 75w, 80w-90 and 85w-140 grades.

MIL-L-2105D As in MIL-L 2105C but allows the use of re-refined base oils.

MIL-L-45199B - Obsolete specification for crankcase oils for severe service in diesel engines. Equivalent to Caterpillar Superior Lubricants (Series 3) with addition of L-38 test.

MIL-L-46152A - Obsolete specification for commercial vehicles operated by the Military and government agencies. Does not contain

restrictions on the use of re-refined base oils. Includes a limit of 0.14% on phosphorus, which was inserted to reduce fouling of catalytic converters. Combines performance requirements of API Service SE and CC.

MIL-L-46152B - Obsolete specification for crankcase oils for commercial vehicles operated by the military and government agencies. Combines requirements of API Services DF and CC. Also contains a 0.14% limit on phosphorus and contains no restrictions on the use of re-fined base oils.

MIL-L-46152C - replaced MIL-L-46152B but the changes are minor including the presentation of certificate that the oil blends do not contain carcinogens among other things. None of these minor changes made any effect on the performance level which is still at API-SF/CÇ.

MIL-L-46152D - Obsolete specification for crankcase oils for commercial vehicles operated by the military and government agencies. Combine the requirements of API services SC and CC. Provides improved dispersancy, anti-wear and antioxidant properties over the MIL-L-46152C product.

MIL-L-46152E - Specification for crankcase oils for commercial vehicles operated by the military and government agencies. Combines the requirements of API Services SC and CC and stipulates only multi-grade oils. Limits are included for both high temperature high shear (HTHS) viscosity and evaporation loss.

SAE/ISO VISCOSITY CLASSIFICATION

SAE VISCOSITY GRADES FOR ENGINE OIL

SAE J300 revised JULY 04 (1)

NOTE: 1 cP = 1 mPa.s; 1 cSt = 1 mm2/s
(1) All values are critical specification as defined by ASTM D3244 (see text, section 3).
(2) ASTM D5293.
(3) ASTM D4684 (see also Appendix B and text, section 4.1). Note that the presence of any yield stress detectable by this method constitutes a failure regardless of viscosity.
(4) ASTM D445.
(5) ASTM D4683, CEC L-36-A-90 (ASTM D4741).

SAE VG	Low Temp. (°C) Cranking Vis.(2), cP max.	Low Temp. (°C) Pumping Vis.(3), cP max. with no yield stress	Low-Shear-Rate Kinematic Vis. (4) (cSt) @ 100 °C, min.	Low-Shear-Rate Kinematic Vis. (5) (cSt) @ 100 °C, max.	High-Shear-Rate Vis.(5) (cP) @ 150 °C and 10 8S -1 min.
0 W	6200 at -35	60,000 at -40	3.8	-	-
5 W	6600 at -30	60,000 at -35	3.8	-	-
10 W	7000 at -25	60,000 at -30	4.1	-	-
15 W	7000 at -20	60,000 at -25	5.6	-	-
20 W	9500 at -15	60,000 at -20	5.6	-	-
25 W	13000 at -10	60,000 at -15	9.3	-	-
20	-		5.6	< 9.3	2.6
30	-		9.3	< 12.5	2.9
40	-		12.5	< 16.3	2.9 (0W--40, 5W-40, 10W-40 grades)
40	-		12.5	< 16.3	3.7(15W-40, 20W-40, 25W-40, 40 grades)
50	-		16.3	< 21.9	3.7
60	-		21.9	< 26.1	3.7

AGMA SPECIFICATION FOR GEAR OILS

The American Gear Manufacturers (AGMA) have issued specifications and recommendations for gear lubricants used in various types of gear application. AGMA standard 250.04 details specifications for rust and oxidation inhibited (R&O) and extreme-pressure (EP) lubricants used in enclosed gear drives. The viscosity brackets correspond to those given in ASTM D 2422 “Standard Recommended Practice For Viscosity System For Industrial Fluid Lubricants”.

AGMA Lubricant No.	Viscosity Limits of former AGMA Classification SUS at 100 °F	Corresponding ISO Viscosity Grade
1	193-235	46
2, 2EP	284-347	68
3,3EP	417-510	100
4,4EP	626-765	150
5,5EP	918-1122	220
6,6EP	1335-1632	320
7 Comp, 7EP	1919-2346	460
8 Comp, 8EP	2837-3467	680
8A Comp	4171-5098	1000

NLGI LUBRICATION GREASE CLASSIFICATIONS

AGMA Lubricant No.	Viscosity Limits of former AGMA Classification SUS at 100 °F	Corresponding ISO Viscosity Grade
000	445 – 475	SEMI-FLUID
00	400 – 430	SEMI-FLUID
0	355 – 385	VERY SOFT
1	310 – 340	SOFT
2	265 – 295	MEDIUM SOFT
3	220 – 250	MEDIUM
4	175 – 205	STIFF
5	130 – 160	VERY STIFF

ISO VISCOSITY SYSTEM FOR INDUSTRIAL OILS

Viscosity System Grade Identification	Mid-point Viscosity cSt (mm2/s) at 40°C	Kinematic Viscosity Limits, cSt (mm2/s) at 40°C	
		Minimum	Maximum
2	2.2	1.89	2.42
3	3.2	2.88	3.52
5	4.6	4.14	5.06
7	6.8	6.12	7.48
10	10	9.00	11.0
15	15	13.5	16.5
22	22	19.8	24.2
32	32	28.8	35.2
46	46	41.4	50.6
68	68	61.2	74.8
100	100	90.0	110
150	150	135	165
220	220	198	242
320	320	288	352
460	460	414	506
680	680	612	748
1000	1000	900	1100
1500	1500	1350	1650

MAIN ENGINE OIL CLASSIFICATIONS AND SPECIFICATIONS

ACEA	(A1-02, A2-96 Issue 3, A3-02, A5-02)
	(B1-02, B4-02, B5-02)
	(E5-02)
	A1/B1-04, A3/B3-04, A3/B4-04, A5/B5-04
	C1-04, C2-04, C3-04
	E2-96 Issue 5, E4-99/Issue 3, E6-04, E7-04
API	(SA, SB, SC, SD, SE, SF, SG)
	(CA, CB, CC, CD, CD-II, CE)
	SH, SJ, SL, SM, SN
	CF, CF-2, CF-4, CG-4, CH-4, CI-4, CI-4 PLUS, CJ-4
ILSAC	(ILSAC GF-1)
	ILSAC GF-2, ILSAC GF-3, ILSAC GF-4, ILSAC GF-5
MANUFACTURERS	(MB 227.0/.1)
	MB 228.0/.1, MB 228.2/.3, MB 228.5, MB 228.51, MB 229.1, MB 229.3,
MB 229.31, MB 229.5, MB 229.51	
	MAN 270, MAN 271, MAN M3275, MAN M3277, MAN M3477
	MTU MTL 5044 Type 1, Type 2, Type 3
	(RVI E2 R, RVI E3 R)
	RVI RXD, RVI RD-2, RVI RLD, RVI RLD-2, RVI RXT
	VOLVO VDS, VOLVO VDS-2, VOLVO VDS-3
	(VW 500 00, 501 01, 521 77, 502 00, 505 00, 521 73, 521 83, 503 00,
503 01, 505 01, 506 00, 506 01)	
	VW 521 95, 504 00, 507 00, 521 67, 501 01, 502 00, 505 01
	(Mack EO-K/2), (Mack EO-L)
	Mack EO-M, Mack EO-M PLUS, Mack EO-N Premium Plus
	DAF HP 1, DAF HP 2
	Cummins CES 20071, 20072, 20075, 20076, 20077, 20078
	BMW Longlife-01, BMW Longlife-01 FE, BMW Longlife-04
	(FORD WSS M2C153-G, M2C913-A, M2C153-H, M2C171-C
	FORD WSS M2C913-B, WSS M2C917-A, WSS M2C929A, WSS M2C930A,
WSS M2C934-A	
	GLOBAL DHD-1, JASO DH-1-05, DH-2-05, DL-1-05
	OPEL B 040 2095, OPEL B 040 2098
	SCANIA LDF, SCANIA LDF-2

ENGINE TEST REQUIREMENTS FOR GASOLINE ENGINE OILS

N OT E:
** This test is obsolete; engine parts, and/or test fuel; and/or reference oils are no longer generally available and the test is no longer monitored by the developer or ASTM.*
(1) These API service categories are obsolete and ADCO Lube does not produce these obsolete products.

"S" SERVICE OILS

API Automotive Gasoline Engine Service Categories	Previous API Engine Service Categories	Related Industry Definition	Engine Test Requirements
SA(1)	ML	Straight Mineral Oil	None
SB(1)	MM	Inhibited Oil Only	CRC L-4* or L-38; Sequence IV*
SC(1)	MS (1964)	1964 MS Warranty Approved	CRC L-38; Sequence IIA*; Sequence IIIA*; Sequence IV*; Sequence V*; Caterpillar L-1* (1.0% Sulphur Fuel)
SD(1)	MS (1968)	1968 MS Warranty Approved	CRC L-38; Sequence IIB*; Sequence IIIB*; Sequence IV*; Sequence VB*; Falcon Rust*; Caterpillar L-1* or 1H*
SE(1)	None	1972 Warranty Approved	CRC L-38; Sequence IIB*; Sequence IIIC* or IIID*; Sequence VC* or VD*
SF	None	1980 Warranty Approved	CRC L 38; Sequence IID: Sequence IIID*; Sequence VD*
SG	None	1989 Warranty Approved	CRC L-38 Sequence IID; Sequence IIIE; Sequence VE; Caterpillar 1H2*
SH	None	1994 Warranty Approved	CRC L-38; Sequence IID: Sequence IIIE; Sequence VE Based on CMA Code of Practice.
SJ	None	1997 Warranty Approved	CRC L38; Sequence IID; Sequence IIIE; Sequence VE
SL	None	Based on CMA code of Practice.	
SM	None	2001 Warranty Approved	Sequence IIIF; Sequence IVA; Sequence VG; Sequence VIII
		2005 Warranty Approved	Sequence IIIG; Sequence IVA; Sequence VG; Sequence VIII

ENGINE TEST REQUIREMENTS FOR DIESEL ENGINE OILS

N OT E:
** This test is obsolete; engine parts, and/or test fuel, and/or reference oils are no longer generally available and the test is no longer monitored by the developer or ASTM.*
(1) These API service categories are obsolete and ADCO Lube does not produce these obsolete products.

"C"- COMMERCIAL (Fleets, Contractors, Farmers, etc.)

API Commercial Engine Categories	Previous API Engine Categories	Related Designations Military And Industry	Engine Test Requirements
CA(1)	DG	MIL-L2104A	CRC L-38; Caterpillar L-1* (0.4% Sulphur)
CB(1)	DM	MIL-L-2104A, SUPPLEMENT 1	CRC L-38; Caterpillar L1* (1.0% Sulphur)
CC(1)	DM	MIL-L2104B; MIL-L46152B	CRC L-38; Sequence IID; Caterpillar 1H2*
CD(1)	DS	MIL-L-45199B, SERIES 3	CRC L-38; Sequence IIB*; Sequence IIIB*; Sequence IV*; Sequence VB*; Falcon Rust*; Caterpillar L-1* or 1H*
MIL L-2104C/D/E	CRC L-38; Caterpillar 1G2*	1972 Warranty Approved	CRC L-38; Sequence IIB*; Sequence IIIC* or IIID*; Sequence VC* or VD*
CD-II(1)	None	MILL-L-2104D/E	CRC L-38; Caterpillar 1G2*;
Detroit Diesel 6V53T	None	1989 Warranty Approved	CRC L-38 Sequence IID; Sequence IIIE; Sequence VE; Caterpillar 1H2*
CE(1)	None	None	CRC L-38; Caterpillar 1G2*; Cummins
NTC-400*; Mack T-6; Mack T-7	None	1997 Warranty Approved	CRC L38; Sequence IID; Sequence IIIE; Sequence VE
CF-4	None	None	CRC L-38; Mack T-7; CUMMINS NTC-400*; Caterpillar 1K; Mack T-6
CF	None	None	CRC L-38; Caterpillar 1M-PC
CF-2		None	CRC L-38; Caterpillar 1M-PC;
Detroit Diesel 6V92 TA		2005 Warranty Approved	Sequence IIIG; Sequence IVA; Sequence VG; Sequence VIII
CG-4	None	None	CRC L-38; Sequence III E; RFWT;
Mack T-8; Caterpillar 1N			
CH-4	None	None	Sequence III E; Mack T-9; Mack T8-E; CAT 1K; CAT 1P; Cummins M11; RFWT
CI-4	None	None	Caterpillar 1K or 1N; Caterpillar 1R; Cummins M11; Mack T-8E; Mack T-10; RFWT; HEUI; Sequence IIIF
CJ-4	None	None	CAT C-13 , CAT 1P, CAT 1N, Cummins ISM, ISB, Mack T-11, Mack T-12, GMRTWT, Navistar 7.3L

LUBRICANTS AND GREASE PLANT

ADCO Lubricants blending and packaging plant was set up in 1979. It has since undergone a series of development and expansion to become one of the best such plants in the region. The capacity increased more than 5 times to accommodate the increasing demand for ADCO lubricants locally and internationally. In 1983, a grease production unit was commissioned, the second of its kind in the world, to manufacture high quality greases.

The plant comprises the following units and facilities:
1. State-of-the-art lubricant blending, filling and packaging facility
2. Modern grease manufacturing unit
3. High-technology brake fluid filling unit
4. Modern Transformer oil dehydration, cleaning and filling unit
5. Extensive storage facilities to meet local and export commitments

CENTRAL TESTING LABORATORY

In order to ensure ADCO Lube lubricants stringent quality control, the central laboratory was set up and equipped with the latest technology and versatile facilities to carry out comprehensive testing and quality control services. Its activities include:
1. Testing of blended and imported products–routine quality control
2. Development and approvals of new products prior to Lube & marketing
3. Used oil analysis
4. Fuel analysis

TECHNICAL SUPPORT

The high quality of ADCO Lube products is matched by excellent technical services to ADCO Lube customers to ensure proper and extended usage of ADCO Lube lubricants through:
1. Oil/Engine Monitoring program that provides advice on the condition of oils and engines to ADCO Lube valued customers
2. Lube Surveys to advise customers on the correct type of oil for specific applications based on manufacturer specifications and recommendations
3. Various forms of technical services to help ADCO Lube customers in ensuring trouble free operations.

PRODUCT STORAGE AND SHELF LIFE

It is absolutely necessary to store products properly to ensure quality. It is recommended to store lubricants indoors at moderate temperatures away from dust, moisture and other contaminating sources.
If outdoor storage cannot be avoided, drums must be laid on their sides with the bungs horizontal in order to prevent migration of moisture.
Mixing of oils should be avoided as some oil formulations are incompatible.

The majority of ADCO Lube products remain suitable for use for up to 3 years when stored properly. This period can be reduced to 2 years or less if stored outdoors.

Some products may have shorter shelf lives as shown below:
- Liquid lubricant/stored indoors ..... 3 years
- Liquid lubricant /stored outdoors ..... 2 years
- Electrical/Insulation oils ..... 1 year
- Greases ..... 2 years
- Emulsifiable oils containing Biocides ..... 6 months

MATERIAL SAFETY DATA SHEETS

Most lubricants are relatively harmless and no unusual hazard is involved in their use, provided care is taken to avoid prolonged contact and inhalation. Material Safety Data Sheets (MSDS) available for all ADCO Lube products if required.

CONTAINER / TRUCK LOADING QUANTITIES (LOCAL/EXPORT)

TRUCK LOADING

Pack Size	Pack Nos. Local		Pack Nos. Export	
	W/ Pallets	W/O Pallets	W/ Pallets	W/O Pallets
Drums (208L/175Kg)	80(20)	125	112(28)	130 - 145
Pails (20/25L)	800(20)	-	800(20)	-
Pails (15Kg)	720(20)	-	720(20)	-
6x4 L Cartons	810(18)	-	810(18)	-
6x5 L Cartons	720(18)	-	720(18)	-
12x1 L Cartons	1296(18)	-	1296(18)	-

CONTAINER / TRUCK LOADING QUANTITIES (LOCAL/EXPORT)

20' CONTAINER LOADING - EXPORT

Pack Size	Pack Nos
Drums	78
Pails 20 L	1026
Pails 25 L	855
Pails 15 Kg	840
6x4 L Cartons (Metallic)	864
6x4 L Cartons (Plastic)	602
4x5 L Cartons (Metallic)	965
4x5 L Cartons (Plastic)	720
6x5 L Cartons (Plastic)	516
24x1 L Cartons (Metallic)	728
12x1 L Cartons (Metallic)	1260
24x1 Kg Cartons (Grease)	637
36x1/2 Kg Cartons (Grease)	728
24x1/2 L Cartons (Brake Fluid)	1120
48x1/4 L Cartons (Brake Fluid)	960
6x3 L Cartons (Plastic)	688

ADCO LUBE

NOTES

ADCO LUBE

P5-ELOB Office No. E-26F-01
Hamriyah Free Zone
Sharjah
United Arab Emirates