PERFORMANCE & PROTECTION.
REVOLUTIONIZED.

PRODUCT GUIDE

D-A LUBRICANT COMPANY, INC. PERFORMANCE GUARANTEE

D-A Lubricant Company, Inc. guarantees the quality of all our products. The Quality Guarantee states that any D-A Lubricant product used in an approved application will perform. If there are any equipment problems resulting from the use of a D-A Lubricant product that does not meet the stated specifications, D-A Lubricant Company will pay the reasonable cost of repairing the affected component(s), provided that:

1) the claim is submitted within 30 days of the equipment problem, and

2) the product was used in accordance with D-A Lubricant's and the equipment manufacturer's recommendations, and

3) the damaged component(s) were maintained in accordance with the manufacturer's recommendations, including those relating to quality levels and service intervals, and

4) proof of purchase of D-A Lubricant Company products and a sample of the suspect product(s) are included with the claim.

Additionally, D-A Lubricant Company and our partner organizations may inspect the affected component(s), equipment, and maintenance records to determine the extent of the damage and verify that a D-A product was the cause of the claimed equipment problem. Any use of a D-A product that does not fully comply with the equipment manufacturer's recommendations will require written approval by D-A Lubricant Company to qualify within the D-A Lubricant Quality Guarantee. Extended service intervals require a structured plan, using the D-A Lubricant Company CLS System.

To obtain component repairs under this limited warranty, customers must contact:
D-A Lubricant Company, Inc.
Technical Service Department
801 Edwards Drive, Lebanon, IN 46052
1-800-645-5823

LIMITED WARRANTY

THIS LIMITED WARRANTY IS IN LIEU OF ALL OTHER REMEDIES AND WARRANTIES, EXPRESSED OR IMPLIED OF FITNESS FOR PARTICULAR USE OR OTHERWISE. THIS WARRANTY DOES NOT COVER NORMAL WEAR OF PARTS AND/OR DAMAGE RESULTING FROM ANY OF THE FOLLOWING: NEGLIGENT USE OR MISUSE OF THE PRODUCT OR EQUIPMENT OR DAMAGE DUE TO USE CONTRARY TO THE OPERATING INSTRUCTIONS OF THE EQUIPMENT. THIS WARRANTY DOES NOT COVER ANY ALLEGED INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, ALLEGED DAMAGES RELATING TO RENTAL EXPENSES OR THE LOSS OF USE OF THE VEHICLE. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES SO, THE ABOVE LIMITATIONS AND EXCLUSIONS MAY NOT APPLY.

PRODUCT GUIDE

D-A Lubricant Company
801 Edwards Drive, Lebanon, IN 46052
317-923-5321 • 1-800-645-5823 • Fax: 765-482-3065
www.dalube.com

Information in this Product Guide is provided as a resource on D-A Lubricant Company's products as of October 2025. Please visit DALube.com for the most up-to-date information on all D-A products.

TABLE OF CONTENTS

ENGINE OIL

Heavy Duty Diesel Engine Oil 7
Reliant FS™ 7
Reliant Premium Plus™ 9
Reliant Premium™ 11
Reliant™ 13
Reliant™ Monogrades 15
Heavy Duty Mobile/Compressed Natural Gas Engine Oil 16
Reliant X-92™ 16
Blue Flame GEO 5™ 18
Heavy Duty Railroad/Medium Speed Diesel Engine Oil 20
Railroad Engine Oil SAE 40 20
D-A RREO 7™ SAE 20W-40 21
Heavy Duty Stationary/Landfill/Natural Gas Engine Oil 22
Blue Flame A™ 22
Blue Flame HB-5™ 23
Blue Flame HB-8™ 25
Blue Flame HB-10™ 27
Blue Flame J™ 29
Blue Flame WVP™ 31
European Passenger Car Motor Oil 33
PennGrade® Euro Elite 33
PennGrade® Euro 35
Passenger High Performance Engine Oil 37
PennGrade 1® Synthetic Blend High Performance Oils 37
PennGrade 1® Monograde High Performance Oils 39
PennGrade 1® Break-In Oil SAE 30 41
Passenger Motorcycle Engine Oils/High Performance Engine Oil 42
Brad Penn® High Performance Engine Assembly Lubricant 42
PennGrade Reliant Premium HDEO 43
PennGrade 1® V2 4-Stroke Motorcycle Oil SAE 10W-40 45
PennGrade 1® V2 4-Stroke Motorcycle Oil SAE 20W-50 47
Passenger Car Motor Oil 49
PennGrade® Select 49
PennGrade® Full Synthetic 51
PennGrade® Synthetic Blend 53

TRANSMISSION LUBRICANTS

Heavy Duty Manual/Automated Transmission 55
SynSure 2™ 55
Heavy Duty Automatic Transmissions 57
ProDrive-A™ 57
ProDrive-E™ 58
ProDrive 2™ 59
AutoTrans Super Plus™ 60
AutoTrans Super LV™ 62
AutoTrans Multi-Vehicle 64
AutoTrans G-3™ 66
Heavy Duty TO-4 Transmissions 68
TorGuard™ 68
TorGuard FS™ 70
TorGuard FD™ 72
Heavy Duty Universal Tractor Fluid 74
HydraTrans LV™ 74
HydraTrans 155 EX™ 75

TABLE OF CONTENTS

HydraTrans 135™ 76
HydraTrans 100™ 78

GREASES

Heavy Duty Calcium Based 79
ThermoPlex™ 79
ThermoPlex 3™ 81
ThermoPlex 5™ 83
Heavy Duty Premium 85
Titan Blue™ 85
Heavy Duty Lithium Based 87
MagnaPlex™ 87
MagnaPlex 3™ 89
MagnaPlex 5™ 91
Prolith™ 93
Heavy Duty Specialty 95
Open Gear All Seasons™ 95
Corn Head Grease 96

GEAR LUBRICANTS

Heavy Duty GL-3 Gear Oils 97
GearTec MGO FS™ 97
GearSyn EP™ 98
Crusher Lubricant™ 100
GearTec MGO™ 102
GTD™ 104
Heavy Duty GL-5 Gear Oils 107
SynSure™ 107
SynSure 2™ 109
GearTec™ 111
Heavy Duty Specialty 113
DTL™ 113
GearSyn RO™ 115
TorGuard FD™ 117
Rock Drill™ 118
Heavy Duty Bio-Based 119
eco-drill™ 119
Passenger GL-4 Gear Oils 120
PennGrade 1® Multi-Purpose 'Classic' Gear Oil GL-4 SAE 80W-90 120
Passenger GL-5 Gear Oils 121
PennGrade 1® Full Synthetic Hypoid Gear/Blower Racing Lubricant 121
PennGrade 1® Limited Slip GL-5 Gear Oil SAE 80W-90 122

HYDRAULIC OILS

Heavy Duty Ashless/Zinc-Free Antiwear 123
HydraSafe HiVi™ 123
HydraSafe™ 124
Heavy Duty Bio-Based 126
eco-flo™ 126
Heavy Duty Mining Fluid 128
Mining Fluid 128
Heavy Duty R&O Oil 129
R&O Oil 129
Heavy Duty Specialty 130
PresurFlo FR™ 130

TABLE OF CONTENTS

Heavy Duty Zinc Antiwear....131
PresurFlo HiVi™....131
PresurFlo™....133
PresurFlo MV™....135

ANTIFREEZES
Heavy Duty....137
Reliant HD™ Nitrite-Free Antifreeze/Coolant....137
Reliant HD™ Extended Life Antifreeze/Coolant....139
Reliant HD™ Multi-Vehicle Antifreeze/Coolant....141
Reliant HD™ Fully Formulated Antifreeze/Coolant....143
Passenger....145
PennGrade® Conventional Antifreeze/Coolant....145

SPECIALTY PRODUCTS
Heavy Duty Specialty....147
Concrete Form Oil™....147
D-A Cross Transformer Oil™....148
Bar and Chain Oil....149
No Rust Journal Bearing Oil....150
Specialty....152
Brad Penn® Security Non Detergent Motor Oil....152

INDUSTRIAL
Heavy Duty Circulating Oil....153
Circulating Oil GR II™....153
Heavy Duty Compressor....154
Torque Fluid II™....154
WearGuard™ SYN 3000 Series....155
WearGuard™ SYN 8000i Series....156
WearGuard™ SYN Compressor Flush....157
WearGuard™ SYN 2000 Series....158
WearGuard™ SYN 7000 Series....159
WearGuard™ SYN HVI Compressor Oil 32/46....160
Heavy Duty Food Grade....161
WearGuard™ D-A FQH WO Series....161
Heavy Duty Heat Transfer Oil....162
Heat Transfer Oil No. 300™....162
HTCF Oil™....163
Heat Transfer Oil 22™....164
Custom Blend Heat Transfer Fluid....165
Heavy Duty Specialty....166
WearGuard™ MWF....166
Fast Quench 70™....168
WearGuard™ SYN 6000 Series....169
WearGuard™ SYN 8000s Series....170
Heavy Duty Turbine/R&O....171
WearGuard™ SYN Turbine Oil....171
WearGuard™ Turbine Oil....172
Heavy Duty Way Oil....173
Way Lube....173
Heavy Duty Wireline Lubricant....174
WearGuard™ Wireline Lubricant....174

Reliant FS™

Reliant FS™ engine oils have been specifically formulated to meet today's heavy-duty diesel OEM (Original Equipment Manufacturer) requirements and stringent API Commercial Category CK-4 specifications. Blended with state-of-the-art, technologically advanced additives and superior quality synthetic base oils, **Reliant FS**™ engine oils surpass the higher performance demands of model year 2017 and newer heavy-duty diesel engine hardware. The API Commercial Category CK-4 offers backwards compatibility for older diesel engines requiring older, obsolete Commercial classifications including CJ-4, CI-4 Plus, CI-4 and CH-4. D-A **Reliant FS**™ engine oils promote robust engine cleanliness and protectsagainst deposit formation. They also guard against viscosity increase by affording superior thermal / oxidation stability under extreme temperature 'severe service' (duty) operation and effectively minimizeharmful oxidative conditions. D-A **Reliant FS**™ also provides outstanding pumpability / flowability inextreme cold ambient environments. Additionally, the D-A **Reliant FS**™ engine oils afford significantalkalinity or higher TBN (Total Base Number) to maximize acid neutralization and prevent harmfulcomponent corrosion. They also offer proven soot control and combat performance robbing oil degradation/ viscosity breakdown. The **Reliant FS**™ engine oils maintain film strength and shear stabilitythroughout intended service, equating to longer, more pronounced service drain intervals. D-A **Reliant FS**™ engine oils are available in 5W-30 and 5W-40 viscosities, delivering exceptional fuel efficiency andpotential increased horsepower benefits. The **Reliant FS**™ 5W-40 is also suitable for use in gasolinepowered, API Service Category related engines, making it an excellent option for mixed fleet (diesel /gasoline) commercial or personal vehicles requiring such.

PRODUCT FEATURES AND BENEFITS
Carefully selected, high quality base oils designed for diesel engine service provide:

- Reduced Oil Consumption
- Improved control of engine wear through rapid oil flow on cold, ambient start
- Proper metal-to-metal separation during high temperature / high load operation

Formulated to support the performance requirements of API Commercial Category CK-4 (5W-30 & 5W-40) as well as API Service Category SN (5W-40). Recommended for use in latest model diesel engines fueled with Ultra Low Sulfur Fuel and Low Sulfur Fuels. Contains the optimum amount of detergents to keep internal engine parts clean (minimize piston / cylinder deposits) and operating efficiently.

Reliant FS™ 5W-40 API SN status supports BOTH modern and legacy diesel / gasoline engine requirements. The use of a shear stable polymer results in resistance to in-service viscosity loss, maintaining 'stay-in-grade' performance / viscosity protection under tough service conditions. Perfected formulation balance for reduced maintenance expense and support of engine manufacturer warranty service requirements. **Reliant FS**™ Engine Oil composition has been designed to protect and provide extended life for various emissions / exhaust aftertreatment devices associated with today's modern diesel applications.

D-A **Reliant FS**™ products support the performance requirements of most major OEM engine manufacturers.

*NOTE: The **Reliant FS**™ 5W-30 is not suitable for use in gasoline powered, spark ignited engines.

Reliant FS™ (cont'd)

TYPICAL APPLICATIONS

Reliant FS™ 5W-30

API Approvals
API CK-4 (Backwards Compatible)

OEM Approvals

CAT ECF-3	Mack EOS-4.5
DDC DFS 93D222	Renault RLD-4
Ford WSS M2C171-F1	Volvo VDS-4.5

Meets the Performance Requirements of:

ACEA E9-16	JASO DH-2
Cummins CES 20086	MTU Type 2.1
Daimler MB228.31	

Reliant FS™ 5W-40

API Approvals
API CK-4 (Backwards Compatible), API SN (Gasoline Engines)

OEM Approvals

CAT ECF-3	Mack EOS-4.5
DDC DFS 93K222	Renault RLD-4
Ford WSS-M2C171-F1	Volvo VDS-4.5

Meets the Performance Requirements of:

ACEA E9-16	Daimler MB228.31
ACEA E6-12	JASO DH-2
ACEA E7-12	MTU Type 2.1
ACEA E9-12	
Cummins CES 20086	

TYPICAL PROPERTIES

SAE Viscosity Grade	J300	5W-30	5W-40
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 11.6 69.9	 15.2 92.2
Viscosity Index	ASTM D2270	161	174
HTHS Viscosity, cP @150°C (min)	ASTM D4683	3.5	4.1
Pour Point, °F (°C)	ASTM D97	-44 (-42)	-38 (-39)
Flash Point, °F (°C)	ASTM D92	424 (218)	448 (231)
Sulfated Ash, Weight %	ASTM D874	1.0	1.0
Total Base Number	ASTM D2896	11.1	11.2
CCS @ -30°C, cP	ASTM D5293	6330	6120

D-A PART NUMBER

	5W-30	5W-40
Bulk	N/A	52261
Tote – 330 Gal	52253	52263
Drum – 55 Gal	52252	52262
Bag-in-a-box – 6 Gal	N/A	52265
Pail (Plastic) – 5 Gal	52258	52268
Case – 4/1 Gal	N/A	52264

Reliant Premium Plus™

Reliant Premium Plus™ synthetic blend diesel engine oil is a lower viscosity next generation diesel engine oil formulated to meet the latest oil and engine technology standards. It has been created with the highest quality base stocks and latest advancements in additive technology for maximizing engine durability, service efficiency and fuel economy without sacrificing engine protection. **Reliant Premium Plus**™ diesel engine oil is intended for modern (2017 and newer) diesel engines.

Reliant Premium Plus™ diesel engine oil has been formulated to exceed industry requirements of the new API FA-4 specification and tailored to meet leading OEM (Original Equipment Manufacturer) engine design / requirements for modern diesel engine service / operation. **Reliant Premium Plus**™ diesel engine oil FA-4 may be incompatible with older API Commercial Category (API CK-4, CJ-4, CI-4 Plus, CI-4) oils and that any interchange (co-mingling) should be avoided, as earlier diesel engines may not be designed to operate with lower viscosity grades. Consult OEM prior to selection.

PRODUCT FEATURES AND BENEFITS

- Exceeds the new industry requirement of API FA-4
- State-of-art synthetic blend additive technology
- Maximum engine durability and fuel economy
- Optimum selection for mixed (new / older equipment) fleets
- Exceptional oxidation resistance, shear stability and aeration control
- Enhanced thermal stability
- Superior emission system(s) protection
- Millions of miles of extensive 'real world' field tests
- Premium wear protection
- 100% Made in the USA

TYPICAL APPLICATIONS

Reliant Premium Plus™ diesel engine oil is recommended for use in heavy duty diesel on-road applications specifying a FA-4 rated engine lubricant. Always consult your owner's manual for proper oil viscosity and quality selection.

APPROVALS AND SPECIFICATIONS

Reliant Premium Plus™ **10W-30**

API Approvals
  API FA-4
OEM Approvals
  DDC DFS 93K223
Meets the Performance Requirements of:
  Cummins CES 20087

Reliant Premium Plus™ (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	J300	10W-30
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 10.0 65.1
Viscosity Index	ASTM D2270	137
HTHS Viscosity, cP @150°C (min)	ASTM D4683	3.1
Pour Point, °F (°C)	ASTM D97	-36 (-33)
Flash Point, °F (°C)	ASTM D92	446 (230)
Sulfated Ash, Weight %	ASTM D874	1.0
Total Base Number	ASTM D2896	10.8
CCS @ -30°C, cP	ASTM D5293	5690

D-A PART NUMBER

Bulk	52331
Tote – 330 Gal	52333
Drum – 55 Gal	52332

Reliant Premium™

Reliant Premium™ synthetic blend is a new generation of diesel engine protection. Advances in diesel engine technology have escalated significantly from what existed a decade ago. Today's engines are substantially more powerful and efficient than once imagined. Changes made to achieve this have created more severe operating conditions that place new levels and types of stress on the engine oil. In response to this, the lubricant industry has adopted new performance standards, designated as API CK-4. Engine oils meeting this new standard must deliver increased levels of engine protection and oil durability that meet the needs of new engine designs while simultaneously providing a higher degree of protection for older model engines. Equipment manufacturers are adopting elevated standards at the same time to meet the specific needs of their engine designs.

PRODUCT FEATURES AND BENEFITS
D-A Lubricant Company developed **Reliant Premium**™ to respond to the new challenges of diesel engine protection. Formulated to exceed the basic industry standards, **Reliant Premium**™ offers users a truly differentiated option from the average engine oil. Compared to previous generations, or products just meeting the new standards, **Reliant Premium**™ will deliver:

- Substantial engine durability improvements for long, reliable equipment life
- Enhanced resistance to oil breakdown to maintain flow properties and maximize drain interval potential
- Exceptional ability to suppress harmful acids generated in combustion
- Confidence of performance in both new and older vehicle models (backwards compatible) Combination of synthetic blend technology and unique additives ensure excellent thermal and oxidation stability while protecting against the harmful effects of cold temperature start-ups.

Both viscosity profiles meet the full requirements for protection and performance. Always consult your owner's manual for proper oil viscosity and quality selection guidance.

15W40 - Traditional diesel engine oil viscosity profile
10W30 - For improved fuel efficiency and cold flow properties

TYPICAL APPLICATIONS
Reliant Premium™ synthetic blend diesel engine oils perform in a wide range of heavy-duty applications and in challenging operating environments found on- and off-road. The following industry and specific equipment manufacturer standards are approved and/or suitable for use.

APPROVALS AND SPECIFICATIONS

Reliant Premium™ 10W-30
API Approvals
API CK-4 (Backwards Compatible)

OEM Approvals
CAT ECF-3
Cummins CES 20086
DDC DFS 93K222
Ford WSS-M2C171-F1
Mack EOS-4.5
Renault RLD-4
Volvo VDS-4.5

Meets the Performance Requirements of:
ACEA E9-16
Daimler MB228.31
JASO DH-2
MTU Type 2.1

Reliant Premium™ 15W-40
API Approvals
API CK-4 (Backwards Compatible)

OEM Approvals
CAT ECF-3
Cummins CES 20086
DDC DFS 93K222
Ford WSS-M2C171-F1
Mack EOS-4.5
Renault RLD-4
Volvo VDS-4.5

Meets the Performance Requirements of:
ACEA E9-16
Daimler MB228.31
JASO DH-2
MTU Type 2.1

Reliant Premium™ (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	J300	10W-30	15W-40
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 11.9 79.7	 15.1 114.3
Viscosity Index	ASTM D2270	143	136
HTHS Viscosity, cP @150 °C (min)	ASTM D4683	3.5	4.1
Pour Point, °F (°C)	ASTM D97	-22 (-30)	-27 (-33)
Flash Point, °F (°C)	ASTM D92	446 (230)	435 (224)
Sulfated Ash, Weight %	ASTM D874	1.0	1.0
Total Base Number	ASTM D2896	10.2	10.1
CCS @ -20°C, cP	ASTM D5293	N/A	6070
CCS @ -25°C, cP	ASTM D5293	6150	N/A

D-A PART NUMBER

	10W-30	15W-40
Bulk	52201	52001
Tote – 330 Gal	52203	52003
Drum – 55 Gal	52202	52002
Bag-in-a-box – 6 Gal	52205	52005
Pail (Metal) – 5 Gal	N/A	52009
Pail (Plastic) – 5 Gal	52208	52008
Case – 4/1 Gal	52204	52004
Case – 12/1 Qt	N/A	52006

Reliant™

Reliant™ engine oil is a new generation of diesel engine protection. Advances in diesel engine technology have significantly increased power and efficiency, introducing more severe operating conditions that stress engine oil. To address this, the lubricant industry adopted the API CK-4 performance standard, requiring engine oils to provide enhanced protection and durability for both modern and older engines. OEM's (Original Equipment Manufacturers) are adopting elevated standards at the same time to meet the specific needs of their engine designs. D-A's **Reliant**™ features a robust formulation ensuring excellent performance in a wide variety of diesel engines.

PRODUCT FEATURES AND BENEFITS

D-A's **Reliant**™ heavy duty diesel engine oil is engineered to tackle the challenges of modern diesel engine protection. Designed to exceed industry standards, **Reliant**™ provides users with confidence in maintaining reliable equipment performance and longevity. Compared to earlier generations, **Reliant**™ delivers:

- Enhanced Engine Protection: Superior defense against wear, deposits, and oil breakdown under severe operating conditions.
- Improved Oil Durability: Extended oil life, maintaining stability under high temperatures and pressures.
- Compatibility Across Generations: Suitable for both modern, high-performance engines and older diesel engines.
- Emission System Support: Compatibility with advanced emission control systems like DPFs and EGR.
- Increased Efficiency: Optimized formulations to enhance fuel economy and reduce maintenance costs.

Reliant™ ensures peace of mind by safeguarding equipment and supporting peak performance in demanding environments. Our optimized detergent balance reduces the impact to DPF flow rate and improves service and active regen intervals over traditional detergent systems while promoting premium engine protection and performance. Both viscosity profiles meet the full requirements for protection and performance. Always consult your owner's manual for proper oil viscosity and quality selection guidance.

15W40 - Traditional diesel engine oil viscosity profile
10W30 - For improved fuel efficiency and cold flow properties

TYPICAL APPLICATIONS

Reliant™ Diesel Engine Oils perform in a wide range of heavy-duty applications and in challenging operating environments found on- and off-road. The following industry and specific equipment manufacturer standards are approved and/or suitable for use.

APPROVALS AND SPECIFICATIONS

Reliant™ **10W-30**

API Approvals
- API CK-4 (Backwards Compatible)

OEM Approvals
- CAT ECF-3
- DDC DFS 93K222
- Ford WSS-M2C171-F1
- Mack EOS-4.5
- Renault RLD-4
- Volvo VDS-4.5

Meets the Performance Requirements of:
- Cummins CES 20086
- MTU Type 2.1

Reliant™ **15W-40**

API Approvals
- API CK-4 (Backwards Compatible)

OEM Approvals
- CAT ECF-3
- DDC DFS 93K222
- Ford WSS-M2C171-F1
- Mack EOS-4.5
- Renault RLD-4
- Volvo VDS-4.5

Meets the Performance Requirements of:
- Cummins CES 20086
- MTU Type 2.1

Reliant™ (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	J300	10W-30	15W-40
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 11.6 76.6	 15.0 114.3
Viscosity Index	ASTM D2270	145	135
HTHS Viscosity, cP @150 °C (min)	ASTM D4683	3.5	4.1
Pour Point, °F (°C)	ASTM D97	-38 (-39)	-33 (-36)
Flash Point, °F (°C)	ASTM D92	432 (222)	439 (226)
Sulfated Ash, Weight %	ASTM D874	1.0	1.0
Total Base Number	ASTM D2896	9.5	9.3
CCS @ -20°C, cP	ASTM D5293	N/A	6180
CCS @ -25°C, cP	ASTM D5293	5460	N/A

D-A PART NUMBER

	10W-30	15W-40
Bulk	52191	52101
Tote – 330 Gal	52193	52103
Drum – 55 Gal	52192	52102
Bag-in-a-box – 6 Gal	52195	52105
Pail (Metal) – 5 Gal	N/A	52109
Pail (Plastic) – 5 Gal	52198	52108
Case – 4/1 Gal	52194	52104
Case – 12/1 Qt	52196	52106

Reliant™ Monogrades

D-A **Reliant™ Monogrades** are technologically advanced heavy-duty diesel engine oils, designed to provide extra protection against deposits and wear for engines operating in heavy duty service. D-A **Reliant™ Monogrades** support the performance requirements for diesel engines requiring an engine oil meeting CF and SM. Innovative concepts have been incorporated into D-A **Reliant™ Monogrades** to provide efficient equipment operation and improved component durability.

D-A **Reliant™ Monogrades** are blended from only US refined high-quality base oils. D-A **Reliant™ Monogrades** contain just the right combination of active diesel detergents and dispersants, anti-wear agents, and oxidation, rust, and corrosion inhibitors.

PRODUCT FEATURES AND BENEFITS

- Carefully selected base oils designed for diesel engine service provide:
  - Reduced oil consumption
  - Proper metal-to-metal separation during high temperature, high load operation.
  - Its dual API classification makes D-A Reliant™ Monogrades SAE 30 suitable for use in both gasoline and diesel powered outdoor equipment where the OEM recommends the use of an API CF or SM classified engine oil.
- D-A **Reliant™ Monogrades** can be used in selected powershift transmissions.
- They protect against clutch plate glazing, providing longer transmission life with less slippage.
- Contains high dosage of active diesel detergents to keep internal engine parts clean and operating efficiently.
- Precise product balance for optimum performance and reduced maintenance expense.

TYPICAL APPLICATIONS

Supports the Performance Requirements of:

10W	**40**
API: CF, SM	API: CF, SM
30	**50**
API: CF, SM	API: CF, SM

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	10W	30	40	50
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 6.71 41.11	 15.1 114.3	 14.29 136.1	 18.81 207.1
Viscosity Index	ASTM D2270	118	111	103	101
Pour Point, °F (°C)	ASTM D97	-49 (-45)	-15 (-26)	-11 (-24)	3 (-16)
Flash Point, °F (°C)	ASTM D92	433 (223)	455 (235)	459 (237)	469 (243)
API Gravity	ASTM D4052	32.4	30.0	28.7	27.3

D-A PART NUMBER

	10W	30	40	50
Bulk	51911	51931	51941	51951
Tote – 330 Gal	51913	51933	51943	N/A
Drum – 55 Gal	51912	51932	51942	N/A
Pail (Metal) – 5 Gal	51919	51939	51949	N/A
Pail (Plastic) – 5 Gal	51918	51938	51948	51958
Case – 4/1 Gal	N/A	51934	51944	N/A
Case – 12/1 Qt	N/A	51936	N/A	N/A

Reliant X-92™

D-A **Reliant X-92**™ is the lubricant solution for today's multi-fueled fleet(s) containing diesel, gasoline and processed natural gas (CNG/LPG/LNG) fueled engines. It is designed for use in severe on- and off-highway applications and provides premier oxidative and thermal stability, durability, outstanding TBN retention, superior wear protection and greatly exceeds industry standards for deposit control. **Reliant X-92**™ will afford 'all-season' performance and hardware protection.

D-A **Reliant X-92**™ is formulated with thermally stable, high VI base oils to improve oxidation thermal stability and offer exceptional cold temperature performance. These base oils are combined with an advanced additive system to retain alkalinity (TBN), control deposit formation, promote engine cleanliness, offer exceptional wear protection and protect sensitive emissions system (catalyst safe). Under proper maintenance, D-A **Reliant X-92**™ will bolster engine component longevity and overall long service life.

PRODUCT FEATURES AND BENEFITS

D-A **Reliant X-92**™ is approved for the latest Cummins Engineering Standard (CES 20092), providing significantly improved oxidation, thermal stability and durability. CES 20092 is back applicable to Cummins CES 20085 natural gas engine oil specification. Additionally, those currently utilizing CES 20074 natural gas engine oil specification in legacy lean burn engines can convert to CES 20092.

- Formulated with thermally stable, high VI base oils in combination with state-of-the-art additive technology delivering exceptional resistance to oxidation, nitration and viscosity increase for longer oil life.
- Ideally suited for compressed natural gas (CNG), liquified natural gas (LNG) and liquified petroleum gas (LPG) fueled engines utilized for urban / municipality service, including public transportation (buses, taxi cabs), garbage/waste haulers, heavy duty service and light duty applications.
- Lower oil volatility and viscosity loss at elevated temperatures promotes reduced oil consumption rates, cleaner combustion chambers, longer spark plug life and longer cylinder head servicing intervals.
- Eliminates the need to carry multiple lubricants for those with mixed fleets possessing passenger car, diesel and processed natural gas fueled vehicles.

TYPICAL APPLICATIONS

D-A **Reliant X-92**™ is designed and tailored specifically to meet the lubrication demands of the modern fleet. **Reliant X-92**™ affords outstanding performance and protection in diesel, gasoline or processed natural gas (CNG, LNG, LPG) fueled engines. D-A **Reliant X-92**™ was uniquely formulated with today's innovative transportation industry in mind and is the answer for those seeking consolidation of mixed fleet engine lubricants.

APPROVALS AND SPECIFICATIONS

Reliant X-92™ **15W-40**

API Approvals
  API CK-4 / SN (Backwards Compatible)
OEM Approvals
  Caterpillar ECF-3
  Cummins CES 20092
  Volvo VDS-4.5
  Mack EOS-4.5
  Renault VI RLD-4
Meets the Performance Requirements of:
  Cummins CES 20086
  Detroit Diesel DFS 93K222

D-A **Reliant X-92**™ meets Non-Selective Catalytic Reduction (NSCR) catalyst compatibility requirements.

Reliant X-92™ (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	J300	15W-40
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 15.8 116
Viscosity Index	ASTM D2270	144
Pour Point, °F (°C)	ASTM D97	-28 (-33.3)
Sulfated Ash, Weight %	ASTM D874	<0.9
Total Base Number	ASTM D2896	10.2
CCS @ -20°C, cP	ASTM D5293	5170

D-A PART NUMBER

Bulk	52301
Tote – 330 Gal	52303
Drum – 55 Gal	52302
Pail (Plastic) – 5 Gal	52308
Case – 4/1Gal	52304

Blue Flame GEO 5™

D-A **Blue Flame GEO 5**™ is designed specifically for use in gas fueled medium and high speed (rpm) engines within the transportation industry. **Blue Flame GEO 5**™ can extend engine life through use of its HardBase TBN of five (5) coming from an exclusive detergent/dispersant additive system that provides a new level of deposit control for low ash oils while also effectively neutralizing the corrosive by-products of combustion.

D-A **Blue Flame GEO 5**™ is formulated with thermally stable, high VI base oils that are naturally resistant to oxidation. These base oils are combined with a unique additive system that further extends oil oxidation life. Special valve cushioning additive components help reduce exhaust valve seat and face wear during severe service. The low ash, low phosphorus composition is compatible with exhaust gas catalytic converters and promotes longer spark plug life for minimized maintenance costs.

PRODUCT FEATURES AND BENEFITS

- Optimum level of active detergent reduces piston ring and cylinder liner wear.
- Effective detergent alkalinity helps control corrosive wear, providing additional protection when using poorer quality fuel sources.
- Special additives maximize retention of effective TBN, providing extra corrosive wear protection during longer service intervals.
- Formulated with thermally stable, high VI base oils in combination with multiple oxidation inhibitors for an oil with outstanding resistance to oxidation, nitration and viscosity increase for longer oil life.
- Compositionally matched with exhaust gas converters to minimize loss of converter activity due to poisoning and masking of the catalyst.
- Cushioning additive components lubricate exhaust valve surfaces for reduced face and seat wear and extended valve service intervals.
- Lower oil volatility and viscosity loss at elevated temperatures promotes reduced oil consumption rates, cleaner combustion chambers, longer spark plug life and longer cylinder head servicing intervals.

TYPICAL APPLICATIONS

D-A **Blue Flame GEO 5**™ is designed specifically for use in medium and high speed (rpm) gas engines fueled by processed natural gas.

D-A **Blue Flame GEO 5**™ is tailored specifically for the transportation industry.

Blue Flame GEO 5™ (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	15W-40
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 14.0 110
Viscosity Index	ASTM D2270	127
Pour Point, °F (°C)	ASTM D97	N/A
Flash Point, COC, °F (°C)	ASTM D92	430 (221)
Sulfated Ash, Weight %	ASTM D874	0.5
Total Base Number	ASTM D2896	5.0
CCS @ -20°C, cP	ASTM D5293	<7000

D-A PART NUMBER

Bulk	52681
Tote – 330 Gal	52683
Drum – 55 Gal	52682

Railroad Engine Oil SAE 40

Railroad Engine Oil is a heavy duty, SAE 40 medium speed diesel engine crankcase oil. It is a high dispersant oil and will keep the by-products of combustion and oxidation finely divided and suspended. Railroad Engine Oil helps maintain a clean ring belt area, valve deck, crankcase and piston undercrowns.

Railroad Engine Oil has excellent alkalinity retention for acid neutralization and wear control. Sludge build-up due to soot and moisture contamination is minimized. Its non-zinc formulation protects silver bearings and helps provide for minimum wear of rings, pistons and liners. As an added benefit, this product contains less than 10 ppm chlorine.

Railroad Engine Oil supports the performance requirements for service with railroads and marine applications where a zinc-free engine oil is required.

PRODUCT FEATURES AND BENEFITS

- Railroad Engine Oil helps maintain a clean ring belt area, valve deck, crankcase and piston undercrowns.
- Railroad Engine Oil has excellent alkalinity retention for acid neutralization and wear control.
- Sludge build-up due to soot and moisture contamination is minimized.
- Its non-zinc formulation protects

TYPICAL APPLICATIONS

Railroad Engine Oil meets the known performance requirements for medium speed two-cycle and four-cycle diesel engines, including:

ALCO
Electromotive Diesel
Fairbanks Morse
Electromotive Division of General Motors
General Electric Generation 4 Long Life Oils
Locomotive Maintenance Officers Assoc. (LMOA) Generation 5

TYPICAL PROPERTIES

SAE Viscosity Grade	J300	40
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 15.1 137.5
Viscosity Index	ASTM D2270	112
Pour Point, °F (°C)	ASTM D97	-17 (-27)
Flash Point, COC, °F (°C)	ASTM D92	446 (230)
Sulfated Ash, Weight %	ASTM D874	1.15
Total Base Number	ASTM D2896	11
Zinc, ppm (max)	Method 16	10

D-A PART NUMBER

Bulk	51401
Tote – 330 Gal	51403
55 Gal Drum	51402

D-A RREO 7™ SAE 20W-40

D-A **RREO 7™ SAE 20W-40** is designed to meet the stringent performance requirements of new / remanufactured Tier 4 locomotives utilizing ULSD (ultra-low sulfur diesel) and operating under more severe conditions with less oil consumption and lower emissions. It offers reduced SAPS (sulfated ash, phosphorous and sulfur), advanced detergency and dispersancy technology and increased yellow metal and anti-wear protection critical to satisfactory operation and long component life of exhaust after treatment devices (particulate filters and oxidation catalysts). In addition, it affords enhanced alkalinity (TBN) retention and oil consumption reduction characteristics.

PRODUCT FEATURES AND BENEFITS

- LMOA Generation 7
- Specifically designed for use in medium-speed two-cycle and four-cycle diesel engines such as those typically employed in railroad locomotives, certain marine and stationary diesel engine applications.
- Backwards compatibility and increased benefits to older model EMD and GE engines when combined with used oil trend analysis and condition-based monitoring.
- For use in a wide variety of locomotive applications including 'legacy' models (Detroit Diesel, ALCO, Fairbanks Morse).

TYPICAL APPLICATIONS

D-A **RREO 7™ SAE 20W-40** supports the performance requirements for medium speed two-cycle and four-cycle diesel engines, including:

Detroit Diesel
ALCO
Fairbanks Morse

APPROVALS AND SPECIFICATIONS

Locomotive Maintenance Officers Assoc. (LMOA) Generation 7

OEM Approvals

Progress Rail Internal Listing
General Electric LMOA Generation 7 including Tier IV emission levels

TYPICAL PROPERTIES

SAE Viscosity Grade	J300	20W-40
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 15.1 137.5
Viscosity Index	ASTM D2270	112
Pour Point, °F (°C)	ASTM D97	-17 (-27)
Flash Point, COC, °F (°C)	ASTM D92	446 (230)
Sulfated Ash, Weight %	ASTM D874	1.15
Total Base Number	ASTM D2896	11
CCS @ -15°C, cP (SAE Grade Maxiumum: (20W=9500)	ASTM D5293	6900
Zinc, ppm (max)	Method 16	10

D-A PART NUMBER

Bulk	51261
Tote – 330 Gal	51263
Drum – 55 Gal	51262

Blue Flame A™

D-A **Blue Flame A**™ is an ashless industrial gas engine oil engineered for use in two and four cycle light/medium gas engines. It is recommended for applications where an ashless oil is required for best performance. D-A **Blue Flame A**™ resists oxidation and nitration at high operating temperatures thus allowing extended oil life with fewer engine deposits and reduced operational cost. It burns completely to keep gas engine combustion chambers free of deposits that can lead to spark plug fouling and pre-ignition. A high concentration of dispersant additives minimizes piston ring belt, skirt and under crown deposits while also preventing formation of sludge that can plug oil passages and shorten oil filter life.

D-A **Blue Flame A**™ is formulated with thermally stable, high VI base oils that are naturally resistant to oxidation. These base oils are combined with extremely effective ashless dispersant engine cleaners, anti-wear additives for superior control of engine wear and a special inhibitor combination to control oil oxidation and nitration.

PRODUCT FEATURES AND BENEFITS

- High level of ashless dispersants keeps critical engine parts cleaner and working at maximum efficiency.
- Ashless to minimize harmful deposits, which can cause pre-ignition, spark plug fouling and valve failures.
- A balanced blend of chemical inhibitors controls oil oxidation and nitration processes for reduced oil thickening and longer oil life.
- Effective suspension of oil contaminants by dispersant additives to limit oil filter plugging for longer oil filter life.
- Ashless engine oil, light/medium service gas engine oil for use in 2 and 4 cycle engines.
- Burns completely with fewer engine deposits.

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	30	40	15W-40
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 11.5 103	 14.5 148	 14.4 104
Viscosity Index	ASTM D2270	98	97	136
Pour Point, °F (°C)	ASTM D97	-5 (-21)	-10 (-12)	-20 (-29)
Flash Point, COC, °F (°C)	ASTM D92	440 (227)	450 (232)	430 (221)
Sulfated Ash, Weight %	ASTM D874	Nil	Nil	Nil
CCS @ -20°C, cP	ASTM D5293	N/A	N/A	<7000

D-A PART NUMBER

	30	40	15W-40
Bulk	52601	52611	52741
Tote - 330 Gal	N/A	52613	52743
Drum - 55 Gal	52602	52613	52742

Blue Flame HB-5™

D-A **Blue Flame HB-5**™ is designed specifically for use in medium and high speed (rpm) gas engines fueled by processed natural gas or other gas sources that may contain corrosive materials. The HardBase TBN of five (HB-5) comes from an exclusive detergent/dispersant additive system providing a new level of deposit control for low ash oils while also effectively neutralizing the corrosive by-products of combustion.

D-A **Blue Flame HB-5**™ is formulated with thermally stable, high VI base oils that are naturally resistant to oxidation. These base oils are combined with a unique additive system that further extends oil oxidation life. Special valve cushioning additive components help reduce exhaust valve seat and face wear during severe service. The low ash, low phosphorus composition is compatible with exhaust gas catalytic converters and promotes longer spark plug life for minimized maintenance costs.

PRODUCT FEATURES AND BENEFITS

- Optimum level of active detergent reduces piston ring and cylinder liner wear.
- Effective detergent alkalinity helps control corrosive wear, providing additional protection when using poorer quality fuel sources.
- Special additives maximize retention of effective TBN, providing extra corrosive wear protection during longer service intervals.
- Formulated with thermally stable, high VI base oils in combination with multiple oxidation inhibitors for an oil with outstanding resistance to oxidation, nitration and viscosity increase for longer oil life.
- Compositionally matched with exhaust gas converters to minimize loss of converter activity due to poisoning and masking of the catalyst.
- Cushioning additive components lubricate exhaust valve surfaces for reduced face and seat wear and extended valve service intervals.
- Meets sensitive CD/CF bearing wear requirements assuring longer bearing life.
- Lower oil volatility and viscosity loss at elevated temperatures promotes reduced oil consumption rates, cleaner combustion chambers, longer spark plug life and longer cylinder head servicing intervals.
- Unique additives protect against excessive valve sink or recession caused by rapid valve seat and face wear.

TYPICAL APPLICATIONS

Gas compression and transmission
Wellhead gas pumpers
Oil pumpers
Irrigation systems
Total energy systems
Waste water treatment cogeneration plants
Landfill gas cogeneration systems
Manure gas cogeneration

Engine Applications:
Caterpillar
Cummins Rio-Grande
Deutz
Enterprise
Fairbanks Morse
Jenbacher
Minneapolis-Moline
Stewart & Stevenson
Waukesha
White

Meets Non-Selective Catalytic Reduction (NSCR) catalyst compatibility requirements.

For other engine makes and models, consult the D-A Technical Service Department.

Blue Flame HB-5™ (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	30	40	15W-40
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 11.5 100	 14.5 145	 14.0 110
Viscosity Index	ASTM D2270	102	98	127
Pour Point, °F (°C)	ASTM D97	-5 (-21)	10 (-12)	-20 (-29)
Flash Point, COC, °F (°C)	ASTM D92	450 (232)	460 (237)	430 (221)
Sulfated Ash, Weight %	ASTM D874	0.5	0.5	0.5
Total Base Number	ASTM D2896	5.0	5.0	5.0
CCS @ -20°C, cP	ASTM D5293	N/A	N/A	<7000

D-A PART NUMBER

	30	40	15W-40
Bulk	52621	52631	52671
Tote – 330 Gal	52623	52633	52673
Drum – 55 Gal	52622	52632	52672

Blue Flame HB-8™

D-A **Blue Flame HB-8**™ is designed specifically for use in engines fueled by processed natural gas or other gas sources that may contain corrosive materials. It is a medium ash, natural gas engine oil engineered for maximum performance in turbocharged or naturally aspirated medium and high speed (rpm) gas engines. It is formulated for exceptional control of engine deposits and wear, minimized exhaust valve recession, longer oil life and limited corrosive wear in both normal and severe service. The HardBase TBN of eight (HB-8) comes from an exclusive detergent/dispersant additive system providing a new level of deposit control for medium ash oils while also effectively neutralizing the corrosive by-products of combustion. D-A **Blue Flame HB-8**™ is formulated with thermally stable, high VI base oils that are naturally resistant to oxidation. These base oils are combined with a unique additive system that further extends oil oxidation life. Special valve cushioning additive components help reduce exhaust valve seat and face wear during severe service.

PRODUCT FEATURES AND BENEFITS

- Optimum level of active detergent reduces piston ring and cylinder liner wear and keep engines cleaner.
- Extra detergent alkalinity helps control corrosive wear, providing additional engine protection when using poorer quality corrosive fuel sources.
- Special additives maximize retention of effective TBN, providing effective corrosive wear protection during longer service intervals.
- Formulated with thermally stable, high VI base oils in combination with multiple oxidation inhibitors for an oil with outstanding resistance to oxidation, nitration and viscosity increase.
- Compositionally matched with exhaust gas converters to minimize loss of converter activity due to poisoning and masking of the catalyst.
- Cushioning additive components lubricate exhaust valve surfaces for reduced face and seat wear and extended valve service intervals.
- Lower oil volatility and viscosity loss at elevated temperatures promotes reduced oil consumption rates, cleaner combustion chambers, longer spark plug life and longer cylinder head servicing intervals.
- Unique additives protect against excessive valve sink or recession caused by rapid valve seat and face wear.

TYPICAL APPLICATIONS

Gas compression and transmission
Wellhead gas pumpers
Oil pumpers
Irrigation systems
Total energy systems
Waste water treatment cogeneration plants
Landfill gas cogeneration systems
Manure gas cogeneration

Engine Applications:
Caterpillar
Cummins
Deutz
Enterprise
Fairbanks Morse
Jenbacher
Minneapolis-Moline
Stewart & Stevenson
Waukesha
White

Meets Non-Selective Catalytic Reduction (NSCR) catalyst compatibility requirements.

For other engine makes and models, consult the D-A Technical Service Department.

Blue Flame HB-8™ (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	40
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 14.5 145
Viscosity Index	ASTM D2270	98
Pour Point, °F (°C)	ASTM D97	10 (-12)
Flash Point, COC, °F (°C)	ASTM D92	460 (237)
Sulfated Ash, Weight %	ASTM D874	0.8
Total Base Number	ASTM D2896	8

D-A PART NUMBER

Bulk	52731
Tote – 330 Gal	52733
Drum – 55 Gal	52732
Pail (Plastic) – 5 Gal	52738

Blue Flame HB-10™

D-A **Blue Flame HB-10**™ is a specialized gas engine oil intended for severe service in applications utilizing varying quality gas sources. This product has been fortified with extra additives that limit corrosive wear caused by fuel sulfur and/or combustion of volatile halogenated gases. The HardBase TBN of ten (HB-10) comes from an exclusive detergent/dispersant additive system providing longer drain intervals, fewer deposits and longer engine life.

D-A **Blue Flame HB-10**™ is formulated with thermally stable, high VI base oils that are naturally resistant to oxidation. These base oils are combined with a unique additive system that further extends oil oxidation life. Special valve cushioning additive components help reduce exhaust valve seat and face wear during severe service.

PRODUCT FEATURES AND BENEFITS

- Designed to provide extra wear protection when used with fuels containing materials which promote accelerated corrosive wear of critical engine parts.
- Effective detergent alkalinity helps control corrosive wear, to provide longer engine life when using poorer quality fuel sources.
- Unique combination of detergents and dispersants reduces piston deposits and keeps engines cleaner, resulting in more efficient and trouble-free engine operation.
- Formulated with thermally stable, high VI base oils in combination with multiple oxidation inhibitors for outstanding resistance to oxidation, nitration and viscosity increase.
- Lower oil volatility and viscosity loss at elevated temperatures promotes reduced oil consumption rates, cleaner combustion chambers and longer cylinder head servicing intervals.
- Unique additives protect against excessive valve sink or recession caused by rapid valve seat and face wear.

TYPICAL APPLICATIONS

Gas compression and transmission
Wellhead gas pumpers
Oil pumpers
Irrigation systems
Total energy systems
Waste water treatment cogeneration plants
Landfill gas cogeneration systems
Manure gas cogeneration

Engine Applications:
Caterpillar
Cummins Rio-Grande
Deutz
Enterprise
Fairbanks Morse
Jenbacher
Minneapolis-Moline
Stewart & Stevenson
Waukesha
White

Meets Non-Selective Catalytic Reduction (NSCR) catalyst compatibility requirements.

For other engine makes and models, consult the D-A Technical Service Department.

Blue Flame HB-10™ (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	40
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 14.5 145
Viscosity Index	ASTM D2270	98
Pour Point, °F (°C)	ASTM D97	10 (-12)
Flash Point, COC, °F (°C)	ASTM D92	460 (237)
Sulfated Ash, Weight %	ASTM D874	1.0
Total Base Number	ASTM D2896	10.0

D-A PART NUMBER

Bulk	52761
Tote – 330 Gal	52763
Drum – 55 Gal	52762

Blue Flame J™

D-A **Blue Flame J**™ is a high performance oil formulated specifically for use in landfill engines and compressors exposed to abrasive and corrosive fuels. This lubricant begins with naturally high viscosity index base oils for temperature shear stability and is enhanced with our advanced **ChemGuard**™ additive technology. The exclusive D-A **ChemGuard**™ additive technology has advanced oxidation/anti-wear inhibitors that combat against hydrogen sulfide and significantly reduces nitration build-up to protect exceptionally well against rust and corrosion.

Special valve cushioning components are added to help reduce exhaust valve seat recession, piston and bearing wear. The very low zinc/phosphorous and low ash formula is fortified with a detergent/dispersant package to guard against damaging formation of carbon, sludge and lacquer/polish that can cause undesired liner scuffing. It also keeps the oil flowing to prevent blockage and promotes clean oil-ways. D-A **Blue Flame J**™ significantly extends the life of the oil and filters, effectively lowering overall maintenance costs.

PRODUCT FEATURES AND BENEFITS

- Optimum level of active detergent reduces piston ring and cylinder liner wear.
- Effective detergent alkalinity helps control corrosive wear, providing additional protection when using poorer quality fuel sources.
- Special additives maximize retention of effective TBN, providing extra corrosive wear protection during longer service intervals.
- Formulated with thermally stable, high VI base oils in combination with multiple oxidation inhibitors for an oil with outstanding resistance to oxidation, nitration and viscosity increase for longer oil life.
- Compositionally matched with exhaust gas converters to minimize loss of converter activity due to poisoning and masking of the catalyst.
- Cushioning additive components lubricate exhaust valve surfaces for reduced face and seat wear and extended valve service intervals.
- Meets sensitive CD/CF bearing wear requirements assuring longer bearing life.
- Lower oil volatility and viscosity loss at elevated temperatures promotes reduced oil consumption rates, cleaner combustion chambers, longer spark plug life and longer cylinder head servicing intervals.
- Unique additives protect against excessive valve sink or recession caused by rapid valve seat and face wear.

TYPICAL APPLICATIONS

Gas compression and transmission
Wellhead gas pumpers
Oil pumpers
Irrigation systems
Total energy systems
Waste water treatment cogeneration plants
Landfill gas cogeneration systems
Manure gas cogeneration

Meets Non-Selective Catalytic Reduction (NSCR) catalyst compatibility requirements.

For other engine makes and models, consult the D-A Technical Service Department.

APPROVALS

Jenbacher engines Types 2, 3, 4 (Version B only) and 6 (Versions C & E, only) running on gas categories B and C.
(A – Pipeline quality, B – Biogas, C – Contaminated gas).
(The Contaminated gas category includes landfill gas).

Blue Flame J™ (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	40
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 13.3 122
Viscosity Index	ASTM D2270	105
Pour Point, °F (°C)	ASTM D97	-0.4 (-18)
Flash Point, COC, °F (°C)	ASTM D92	450 (232)
Sulfated Ash, Weight %	ASTM D874	0.5
Total Base Number	ASTM D2896	5.0

D-A PART NUMBER

Bulk	52881
Tote – 330 Gal	52883
Drum – 55 Gal	52882

Blue Flame WVP™

D-A **Blue Flame WVP**™ SAE 40 engine oil is designed specifically for use in engines fueled by processed natural gas or other gas sources that may contain corrosive, volatile materials. It is a low ash, natural gas engine oil engineered for maximum performance in turbocharged or naturally aspirated medium and high speed (rpm) gas engines. It is formulated for exceptional control of engine deposits, minimized exhaust valve recession, longer oil life and limited corrosive wear in both normal and severe service. The TBN of 7.0 comes from an exclusive detergent / dispersant additive system providing a new level of deposit control for medium ash oils while also effectively neutralizing the corrosive by-products of combustion.

D-A **Blue Flame WVP**™ is formulated with thermally stable, high VI base oils that are naturally resistant to oxidation. These base oils are combined with a unique additive system that further extends oil oxidation life. Special valve cushioning additive components help reduce exhaust valve seat and face wear during severe service.

PRODUCT FEATURES AND BENEFITS

- D-A Blue Flame WVP™ high level of active detergent reduces piston ring and cylinder liner wear and keep engines cleaner.
- Extra detergent alkalinity helps control corrosive wear, providing additional engine protection when using poorer quality corrosive fuel sources.
- Special additives maximize retention of effective TBN, providing effective corrosive wear protection during longer service intervals.
- Formulated with thermally stable, high VI base oils in combination with multiple oxidation inhibitors for an oil with outstanding resistance to oxidation, nitration and viscosity increase.
- Compositionally matched with exhaust gas converters to minimize loss of converter activity due to poisoning and masking of the catalyst.
- Cushioning additive components lubricate exhaust valve surfaces for reduced face and seat wear and extended valve service intervals.
- Lower oil volatility and viscosity loss at elevated temperatures promotes reduced oil consumption rates, cleaner combustion chambers, longer spark plug life and longer cylinder head servicing intervals.
- Unique additives protect against excessive valve sink or recession caused by rapid valve seat and face wear.

TYPICAL APPLICATIONS

Gas compression and transmission
Wellhead gas pumpers
Oil pumpers
Irrigation systems
Total energy systems
Waste water treatment cogeneration plants
Landfill gas cogeneration systems
Manure gas cogeneration

Engine Applications:
Caterpillar
Cummins Rio-Grande
Deutz
Enterprise
Fairbanks Morse
Jenbacher
Minneapolis-Moline
Stewart & Stevenson
Waukesha
White

Meets Non-Selective Catalytic Reduction (NSCR) catalyst compatibility requirements.

For other engine makes and models, consult the D-A Technical Service Department.

Blue Flame WVP™ (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	40
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 13.3 12.8
Viscosity Index	ASTM D2270	102
Pour Point, °F (°C)	ASTM D97	-16 (-27)
Flash Point, COC, °F (°C)	ASTM D92	490 (254)
Sulfated Ash, Weight %	ASTM D874	0.62
Total Base Number	ASTM D2896	6.1

D-A PART NUMBER

Bulk	52971
Tote – 330 Gal	52973

PennGrade® Euro Elite

PennGrade® Euro Elite Full Synthetic Motor Oil are full synthetic motor oil formulations specifically designed to satisfy domestic / European emissions, OEM (Original Equipment Manufacturer) and ACEA (European Automobile Manufacturers Association) requirements. They meet ACEA C3-08 / API SM standards and are available in two viscosity grades (5W-30 and 5W-40) typically recommended for today's modern European vehicles. Each is recommended as suitable for use in popular European models including BMW, Mercedes-Benz, Volkswagen and others. .

PennGrade® Euro Elite Full Synthetic Motor Oil employ a combination of synthetic base oils and advanced additive technology to meet or exceed the stringent performance demands of late model European gasoline and light duty diesel engines. It is formulated to provide superior fuel economy and wear protection, outstanding thermal and oxidation stability, emissions system (catalytic converter, DPF (Diesel Particulate Filter)). O2 Sensor efficiency and excellent low temperature fluidity and component protection at start-up. Additionally, its full synthetic base promotes extended drain intervals while its proven additive system makes it suitable in turbocharged systems. It meets requirements of API SM/ CF.

PRODUCT FEATURES AND BENEFITS

- Full Synthetic formulation.
- Tailored for late model European gasoline and light diesel engines (medium SAPS).
- Excellent low temperature fluidity and protection at start-up.
- Outstanding thermal and oxidation stability.
- Suitable for emissions (catalytic converter, DPF) and turbocharged systems.
- Promotes extended drain intervals.
- Superior engine cleanliness, deposit control and wear protection.
- Exceptional fuel economy benefits.

TYPICAL APPLICATIONS

PennGrade® Euro Elite Full Synthetic Motor Oil supports the performance for the following specifications:

SPECIFICATIONS

PG Euro Elite 5W30
Meets the Performance Requirements of:
ACEA C3-08, C2-08
API CF
API SM
BMW LL-04
MB 229.51
VW 502.00, 505.00, 505.01

PG Euro Elite 5W40
Meets the Performance Requirements of:
ACEA C3-08, C2-08
API CF
API SM
BMW LL-04
MB 229.51
VW 502.00, 505.00, 505.01

PennGrade® Euro Elite (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	J300	5W-30	5W-40
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 12.2 70.8	 13 75.8
Viscosity Index	ASTM D2270	171	174
Pour Point, °F (°C)	ASTM D97	-51 (-46)	-44 (-42)
Flash Point, °F (°C)	ASTM D92	482 (250)	491 (255)
Sulfated Ash, Weight %	ASTM D874	0.8	0.8
CCS @ -30°C, cP	ASTM D5293	6300	6300
HTHS Viscosity, cP @ 150°C	ASTM D4683	3.5	3.6
Total Base Number	ASTM D2896	7	7

D-A PART NUMBER

	5W-30	5W-40
Bulk	61351	61361
Tote – 330 Gal	61353	61363
Bag-in-a-box – 6 Gal	61355	61365
Case – 12/1 Qt	61356	61366

PennGrade® Euro

PennGrade® Euro Full Synthetic Motor Oil has been formulated with the latest high-tech additive technology and premium quality synthetic base oils. It is designed to meet the toughest demands of today's automotive engine technology, offering exceptional protection and performance for today's engines.

PennGrade® Euro Full Synthetic Motor Oil has been designed to offer the highest levels of performance, engine cleanliness and protection while supporting the performance requirements of API SN. The product has been designed to ensure quick cold weather start-up while protecting vital engine parts, and to provide exceptional protection against wear in high temperature/high stress applications. **PennGrade® Euro Full Synthetic Motor Oil** provides excellent resistance to viscosity breakdown and foaming in modern engines.

PRODUCT FEATURES AND BENEFITS

- Full Synthetic formulation helps increase engine life by maintain oil flow at both high and low temperatures.
- Provides outstanding viscosity stability, superior engine cleaning power, deposit control, and wear protection.
- Combination of synthetic base stocks and unique additives ensures excellent thermal and oxidation stability and outstanding performance during maximum recommend oil drain intervals.
- Excellent low temperature characteristics permit quick engine starting in cold weather and promptly deliver oil to vital metal parts maximizing engine life.
- Anti-foam agents permit higher oil pressure for greater protection.

TYPICAL APPLICATIONS

PennGrade® Euro Full Synthetic Motor Oil supports the performance for the following specifications:

SPECIFICATIONS

PG Euro 5W30

Meets the Performance Requirements of:
ACEA A3/B4-12, A3/B4-16
ACEA A5/B5-12, A5/B5-16
API CF
API SN, SM, SL
BMW LL-01
Ford WSS-M2C913-D
Jaguar Land Rover ST JLR.03.5003
MB 226.5, 229.3, 229.5
Opel GM-LL-A-025, GM-LL-B-025
Porsche A40
PSA Peugeot Citrogën B712296
Renault RN0700, RN0710
Volvo Car 95200377
VW 502.00, 505.00

PG Euro 5W40

Meets the Performance Requirements of:
ACEA A3/B4-12, A3/B4-16
ACEA A5/B5-12, A5/B5-16
API CF
API SN, SM, SL
BMW LL-01
Ford WSS-M2C913-D
Jaguar Land Rover ST JLR.03.5003
MB 226.5, 229.3, 229.5
Opel GM-LL-A-025, GM-LL-B-025
Porsche A40
PSA Peugeot Citrogën B712296
Renault RN0700, RN0710
Volvo Car 95200377
VW 502.00, 505.00

PennGrade® Euro (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	5W-30	5W-40
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 12 70.1	 14.2 83.6
Viscosity Index	ASTM D2270	168	177
Pour Point, °F (°C)	ASTM D97	-51 (-46)	-44 (-42)
Flash Point, °F (°C)	ASTM D92	420 (215)	420 (215)
Sulfated Ash, Weight %	ASTM D874	1.3	1.3
CCS @ -30°C, cP	ASTM D5293	6200	6200
HTHS Viscosity, cP @ 150°C	ASTM D4683	3.6	3.75
Total Base Number	ASTM D2896	11	10

D-A PART NUMBER

	5W-30	5W-40
Bulk	61301	61311
Tote – 330 Gal	N/A	61313
Drum – 55 Gal	61302	61312
Bag-in-a-box – 6 Gal	N/A	61315
Case – 12/1 Qt	N/A	61316

PennGrade 1® Synthetic Blend Performance Oils

PennGrade 1® Synthetic Blend High Performance Oils are specially formulated using high quality, premium base stocks and select additive technologies to meet stringent lubricating demands of high performance, highly stressed street and racing engines.

PennGrade 1® Synthetic Blend High Performance Oils deliver excellent shock load and high temperature protection to heavily stressed engine parts including bearings, camshafts, rings, and pistons. They reduce internal friction for increased horsepower output while maintaining their strong lubricating film protection even under the most demanding torque and extreme temperature conditions. These high performance formulations also provide good anti-foaming and shear stability characteristics, excellent high temperature protection from thermal breakdown, outstanding film strength, and strong anti-wear properties.

PennGrade 1® Synthetic Blend High Performance Oils have a distinct green color and are available in (5) multi-grade viscosities to meet virtually all lubricating requirements of high-performance street and racing engines. The Partial Synthetic SAE 5W-30* is a low viscosity oil tailored to maximize horsepower in engines that use this type of engine oil and is ideally suited in today's street*/racing market 'crate engines' that require this viscosity. Additionally, the 5W-30 contains strong detergent, dispersant and ZDDP anti-wear additives to help protect critical engine parts.

PennGrade 1® Synthetic Blend High Performance Oils SAE 10W-30*, SAE 10W-40*, SAE 15W-40* and SAE 20W-50* are formulated with a typical TBN of 10.6 to provide a high level of detergency for protection against bearing corrosion and piston deposits in both turbocharged and non-turbocharged engines. These engine oils provide outstanding "heavy load" bearing protection on heavily stressed engine parts. The synthetic component of these engine oils enhances the protection afforded at high and low temperature extremes. The 10W-30, 10W-40, 15W-40 and 20W-50 also contain strong dispersant and ZDDP anti-wear additives to protect critical engine parts.

*Not recommended for use in vehicles equipped with catalytic converters

PennGrade 1® Synthetic Blend High Performance Oils (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	5W-30	10W-30	10W-40	15W-40	20W-50
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 11.1 65.6	 10.8 68.6	 15.6 109	 15.5 113	 20 159
Viscosity Index	ASTM D2270	161	138	154	145	140
Pour Point, °F (°C)	ASTM D97	-43.6 (-42)	-27 (-33) (max)	-43.6 (-42)	-43.6 (-42)	-16.6 (-27) (max)
Flash Point, COC, °F (°C)	ASTM D92	395 (202)	400 (204)	400 (204)	400 (204)	420 (216)
Sulfated Ash, Weight %	ASTM D874	1.2	1.2	1.2	1.2	1.2
API Gravity	ASTM D4052	33	30	30.9	29.8	29
Density, lbs/gal (g/l)	Calculated	7.16 (858)	7.30 (875)	7.27	7.32	7.321 (880)
CCS, cP	ASTM D5293	6200 @ (-30°C)	6500 @ (-25°C)	6300 @ (-25°C)	5050 @ (-20°C)	4600 @ (-15°C)
MRV, cP	ASTM D4684	24000 @ (-35°C)	26700 @ (-30°C)	28150 @ (-30°C)	21175 @ (-25°C)	35700 @ (-20°C)
HTHS Viscosity, cP @ 150°C	ASTM D4683	3.185	3.54	4.23	4.52	6.2
Zinc, Mass %	ASTM D6481	0.15	0.15	0.15	0.15	0.15
Phosphorous, Mass %	ASTM D6481	0.14	0.14	0.14	0.14	0.14
Color	ASTM D1500	Green	Green	Green	Green	Green
Total Base Number	ASTM D2896	10.6	10.6	10.6	10.6	10.6

D-A PART NUMBER

	5W-30	10W-30	10W-40	15W-40	20W-50
Drum – 55 Gal	N/A	71502	71442	71582	71192
Case – 4/5 Qt	N/A	71500	71440	N/A	71190
Case – 12/1 Qt	71096	71506	71446	71586	71196

PennGrade 1® Monograde High Performance Oils

PennGrade 1® Monograde High Performance Oils are specially formulated using high quality, premium base stocks and select additive technologies to meet stringent lubricating demands of high performance, highly stressed street and racing engines.

PennGrade 1® Monograde High Performance Oils deliver excellent shock load and high temperature protection to heavily stressed engine parts including bearings, camshafts, rings, and pistons. They reduce internal friction for increased horsepower output while maintaining their strong lubricating film protection even under the most demanding torque and extreme temperature conditions. These high performance formulations also possess good anti-foaming and shear stability characteristics, excellent high temperature protection from thermal breakdown, outstanding film strength, and strong anti-wear properties.

PennGrade 1® Monograde High Performance Oils have a distinct green color and are available in (5) monograde viscosities to meet virtually all lubricating requirements of high performance street and racing engines. The SAE 30*, SAE 40*, SAE 50*, SAE 60* and "Nitro" 70* products are suitable for use in most naturally aspirated, turbocharged or supercharged gasoline engines. Additionally, they offer a typical TBN of 9.45, 9.5 and 10.6 (SAE 30). They are fortified with an anti-wear agent proven to be highly effective in the regime of extremely stressed engines.

PennGrade 1® "Nitro" 70 Monograde High Performance Oil is specifically formulated for gas, alcohol and nitromethane fueled engines that experience extreme torque, load and high temperature conditions. The PennGrade 1® SAE 50 and SAE 60 are suitable for use in gas, alcohol and nitromethane fueled engines where an SAE 50 or SAE 60 are desired. The initial high viscosity of the SAE 50, SAE 60 and "Nitro" 70 allow excessive dumping of fuel ("blow by") into the lubricating fluid while maintaining critical protection for expensive, high performance racing engines and their components. Additionally, the SAE 50, SAE 60 and "Nitro" 70 are ideally suited for the heavier viscosity lubrication needs of the early classic motorcycles/engines like Harley Davidson® (Flathead®, Knucklehead®, Panhead®, Shovelhead®, etc.) and others.

*Not recommended for use in vehicles equipped with catalytic converters

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	30	40	50	60	70 "Nitro"
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 11.65 97	 15.5 150	 20 218.5	 23.3 274.4	 28 314.8
Viscosity Index	ASTM D2270	118	108	106	105	114
Pour Point, °F (°C)	ASTM D97	-22 (-30)	0 (-18)	5 (-15)	5 (-15)	20 (-6)
Flash Point, COC, °F (°C)	ASTM D92	425 (218)	425 (218)	440 (227)	425 (218)	450 (232)
Sulfated Ash, Weight %	ASTM D874	1.2	1.0	1.0	1.0	1.0
API Gravity	ASTM D4052	28	27.5	26.8	26.2	26.7
Zinc, Mass %	ASTM D6481	0.15	0.15	0.15	0.15	0.15
Phosphorous, Mass %	ASTM D6481	0.14	0.14	0.14	0.14	0.14
Density, lbs/gal (g/L)	Calculated	7.40 (887)	7.41 (888)	7.44 (891)	7.485 (897)	7.45 (892)
Color	ASTM D1500	Green	Green	Green	Green	Green
Total Base Number	ASTM D2896	10.6	9.5	9.45	9.45	9.45

PennGrade 1® Monograde High Performance Oils (cont'd)

D-A PART NUMBER

	30	40	50	60	70 "Nitro"
Drum – 55 Gal	71392	N/A	71152	N/A	71172
Case - 4/5 Qt	N/A	N/A	71150	N/A	71170
Case – 12/1 Qt	71396	71406	71156	71166	71176

PennGrade 1® Break-In Oil SAE 30

PennGrade 1® Break-In Oil SAE 30 provides wear control for critical engine parts while allowing the engine components to seat, resulting in maximum engine performance and life. It is formulated with premium base stocks and a state-of-the-art additive system. Available in SAE 30.

PennGrade 1® Break-In Oil SAE 30 is suitable for use in BOTH diesel and gasoline fueled engines. This makes **PennGrade 1® Break-In Oil SAE 30** the optimum choice for professional engine builders.

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	30
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 11.3 93.3
Viscosity Index	ASTM D2270	107
Pour Point, °F (°C)	ASTM D97	-30 (-33)
Flash Point, °F (°C)	ASTM D92	440 (226)
Sulfated Ash, Weight %	ASTM D874	0.95
API Gravity @ 60°F	ASTM D1298A	27.8
Density, lbs/gal (g/L)	Calculated	7.398 (888.3)
Color	ASTM D1500	Green
Total Base Number	ASTM D2896	7.2

D-A PART NUMBER

Drum – 55 Gal	71202
Case – 12/1 Qt	71206

Brad Penn® High Performance Engine Assembly Lubricant

Brad Penn® High Performance Engine Assembly Lubricant is a premium high viscosity lubricant pecifically designed to offer additional protection for “green” moving surfaces in engine assembly applications. Its premium base oil provides higher load carrying ability and excellent surface film protection to prevent wear in highly stressed internal components.

Brad Penn® High Performance Engine Assembly Lubricant is readily miscible with all types of mineral based and synthetic engine oils. It does not contain solid fillers such as molybdenum or graphite which can cause “clumping” and/or oil filter plugging. **Brad Penn® High Performance Engine Assembly Lubricant** is recommended as a pre-lube for engine components including valve trains, cam lobes, lifters, wrist pins, rod bearings, main bearings, etc. It is the lubricant chosen by engine mechanics performing in-frame diesel rebuilds. It will not run or drip from treated parts due to its tacky/stringy nature and will protect assembled engines from rust and corrosion during assembly period and shipment.

This product is not recommended for transmission assembly/rear-end systems and should not be added/mixed with transmission fluids or gear lubricants. **Brad Penn® High Performance Engine Assembly Lubricant** is a great complement to the **Brad Penn® High Performance** line.

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	Typical Properties
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 54,19 817.2
Viscosity Index	ASTM D2270	121
Pour Point, °F (°C)	ASTM D97	10 (-12)
Flash Point, °F (°C)	ASTM D92	460 (238)
API Gravity	ASTM D4052	25.9
ADensity, lbs/gal (g/l)	Calculated	7.5 (898)
Color	ASTM D1500	Green
Appearance	N/A	Tacky

D-A PART NUMBER

Case – 12/6 oz	71055

PennGrade Reliant Premium HDEO SAE 15W-40

PennGrade Reliant Premium HDEO synthetic blend is a new generation of diesel engine protection. Advances in diesel engine technology have escalated significantly from what existed a decade ago. Today's engines are substantially more powerful and efficient than once imagined. Changes made to achieve this have created more severe operating conditions that place new levels and types of stress on the engine oil. In response to this, the lubricant industry has adopted new performance standards, designated as API CK-4. Engine oils meeting this new standard must deliver increased levels of engine protection and oil durability that meet the needs of new engine designs while simultaneously providing a higher degree of protection for older model engines. Equipment manufacturers are adopting elevated standards at the same time to meet the specific needs of their engine designs.

D-A Lubricant Company developed **PennGrade Reliant Premium HDEO** to respond to the new challenges of diesel engine protection. Formulated to exceed the basic industry standards, **PennGrade Reliant Premium HDEO** offers users a truly differentiated option from the average engine oil. Compared to previous generations, or products just meeting the new standards, **PennGrade Reliant Premium HDEO** will deliver:

- Substantial engine durability improvements for long, reliable equipment life
- Enhanced resistance to oil breakdown to maintain flow properties and maximize drain interval potential
- Exceptional ability to suppress harmful acids generated in combustion
- Confidence of performance in both new and older vehicle models (backwards compatible)
- Combination of synthetic blend technology and unique additives ensure excellent thermal and oxidation stability while protecting against the harmful effects of cold temperature start-ups.
- An optimized detergent balance that reduces the impact to DPF flow rate and improves service intervals over traditional detergent systems while promoting premium engine protection and performance.

TYPICAL APPLICATIONS

PennGrade Reliant Premium synthetic blend diesel engine oils perform in a wide range of heavy-duty applications and in challenging operating environments found on- and off-road. The following industry and specific equipment manufacturer standards are approved and/or suitable for use.

APPROVALS AND SPECIFICATIONS
PennGrade Reliant Premium HDEO
API Approvals
API CK-4 (Backwards Compatible)

OEM Approvals
CAT ECF-3
Cummins CES 20086
DDC DFS 93K222
Ford WSS-M2C171-F1
Mack EOS-4.5
Renault RLD-4
Volvo VDS-4.5

Meets the Performance Requirements of:
ACEA E9-16
Deutz DQC III-18 LA
Daimler MB228.31
JASO DH-2
MTU Type 2.1

TYPICAL PROPERTIES

SAE Viscosity Grade	J300	15W-40
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 15.1 114.3
Viscosity Index	ASTM D2270	136
HTHS Viscosity, cP @150°C (min)	ASTM D4683	4.1
Pour Point, °F (°C)	ASTM D97	-27 (-33)
Flash Point, °F (°C)	ASTM D92	435 (224)
Sulfated Ash, Weight %	ASTM D874	1.0
Total Base Number	ASTM D5293	10.1
CCS @ -20°C, cP	ASTM D5293	6070
CCS @ -25°C, cP	ASTM D5293	N/A

D-A PART NUMBER
Case – 4/5 Qt 72100

PennGrade 1® V2 4-Stroke Motorcycle Oil SAE 10W-40

Blended with premium base oils, select synthetic components and superior additive chemistry, **PennGrade 1® V2 4-Stroke Motorcycle Oil SAE 10W-40** is specifically formulated to offer the ultimate in quality, performance and protection for motorcycles. Unlike most other multi-viscosity motorcycle oils, the very unique viscosity modifier used in our PennGrade 1® oil is not based upon conventional polymers which can shear significantly with use and cause loss of oil viscosity. This viscosity modifier imparts exceptional High Temperature High Shear viscosity protection to our **PennGrade 1® V2 4-Stroke Motorcycle Oil SAE 10W-40** that is so critical for protection of high speed, high revving motorcycle engines. Further, in applications where the same oil is used for lubrication of both the engine and transmission, the excellent shear stability of this motorcycle oil offers a distinctive operational advantage over other less shear-stable oils. Increased levels of 'zinc' (zinc dialkyldithiophosphate) in **PennGrade 1® V2 4-Stroke Motorcycle Oil SAE 10W-40** provide exceptional anti-wear/anti-scuffing protection. Detergents, dispersants and anti-oxidants offer protection from thermal and/or oxidative oil breakdown that can lead to varnish and deposit formation. Anti-foam agents reduce oil foaming and air entrainment under high-speed and/or high-RPM operation.

PERFORMANCE ADVANTAGES

The **PennGrade 1® V2 4-Stroke Motorcycle Oil SAE 10W-40** affords excellent High Temperature protection for air and water cooled 4-cycle engines and resists thermal and/or oxidative breakdown. It also offers superior high temperature/high shear viscosity. It meets JASO MA-2 performance requirements for use in wet clutches. JASO MA-2 offers improved frictional characteristics exceeding those of JASO MA. Oils meeting JASO MA-2 are suitable for use in JASO MA applications.

TYPICAL APPLICATIONS

Suitable for use in Honda®, Kawasaki®, Suzuki®, Yamaha® and other 4-stroke motorcycles where an API SJ, SH or SG quality oil is specified. Consult your owner's manual for proper oil viscosity and quality selection. May also be used in ATVs, golf carts, 4-wheelers and other 4-stroke engine applications.

PennGrade 1® V2 4-Stroke Motorcycle Oil SAE 10W-40 (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	10W-40
API Service	SAE J183	SJ, SH, SG
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 13.5 85.5
Viscosity Index	ASTM D2270	162
Pour Point, °F (°C)	ASTM D5949	-35 (-39)
Flash Point, °F (°C)	ASTM D92	425 (218)
Sulfated Ash, Weight %	ASTM D874	0.88
API Gravity	ASTM D4052	32.1
Density, lbs/gal (g/l)	Calculated	7.202 (863)
CCS, cP	ASTM D5293	6600 @ (-25°C)
MRV, cP	ASTM D4684	28000 @ (-30°C)
HTHS Viscosity, cP @ 150°C	ASTM D4683	4.39
Zinc, Mass %	ASTM D6481	N/A
Phosphorous, Mass %	ASTM D6481	N/A
Color	ASTM D1500	Green
Total Base Number	ASTM D2896	7.5

D-A PART NUMBER

Case – 12/1 Qt 71566

PennGrade 1® V2 4-Stroke Motorcycle Oil SAE 20W-50

PennGrade 1® V2 4-Stroke Motorcycle Oil SAE 20W-50 is formulated with mineral based premium grade base oils and superior additive chemistry specifically designed with V-Twin domestic and imported motorcycle engine technology/ lubrication needs in mind. It provides increased levels of 'zinc' (zinc dialkyldithiophosphate) for exceptional anti-wear/ anti-scuffing protection. Detergents, dispersants and anti-oxidants offer protection from thermal and/or oxidative oil breakdown that can lead to varnish and deposit formation. Anti-foam agents reduce oil foaming and air entrainment under high-output, high revving conditions. It meets JASO MA frictional performance requirements for wet clutches and is suitable for use in applications calling for one lubricant for the engine, transmission/wet clutch and primary chain systems (if applicable).

PERFORMANCE ADVANTAGES
The PennGrade 1® V2 4-Stroke Motorcycle Oil SAE 20W-50 affords premium grade base oils that provide exceptional film strength. It offers excellent High Temperature protection for air and water cooled 4-cycle engines and resists thermal and/or oxidative breakdown. This product provides superior high temperature/high shear viscosity. Additionally, it offers increased levels of 'zinc' (zinc dialkyldithiophosphate) for outstanding anti-wear/anti-scuffing protection. It meets JASO MA frictional performance requirements for use in wet clutches.

TYPICAL APPLICATIONS
PennGrade 1® V2 4-Stroke Motorcycle Oil SAE 20W-50 is a good multi-viscosity choice for use in V-Twin engines such as those commonly found in Harley-Davidson® motorcycles where an SAE 20W-50, API Service SJ, CF or CH-4 quality motor oil is specified. Also suitable for use in S&S®, RevTech® and other 4-stroke domestic and imported motorcycles where an SAE 20W-50 viscosity, API SJ, SH, SG, CH-4 or CF quality oil is specified. Always consult your owner's manual for proper oil viscosity and quality selection.

PennGrade 1® V2 4-Stroke Motorcycle Oil SAE 20W-50 (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	20W-50
API Service	SAE J183	CH-4, CF SJ, SH, SG
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 19.35 167
Viscosity Index	ASTM D2270	130
Pour Point, °F (°C)	ASTM D97	-27.4 (-33)
Flash Point, °F (°C)	ASTM D92	425 (218)
Sulfated Ash, Weight %	ASTM D874	1.2
API Gravity	ASTM D1298A	28.6
Density, lbs/gal (g/l)	Calculated	7.375 (884)
CCS, cP	ASTM D5293	6750 @ (-15°C)
MRV, cP	ASTM D4698	40000 @ (-20°C)
HTHS Viscosity, cP @ 150°C	ASTM D5481	5.7
Zinc, Mass %	ASTM D6481	N/A
Phosphorous, Mass %	ASTM D6481	N/A
Color	ASTM D1500	Green
Total Base Number	ASTM D2896	9.1

D-A PART NUMBER

Drum – 55 Gal	71572
Case – 12/1 Qt	71576

PennGrade® Select

PennGrade® Select is a premium full synthetic gasoline motor oil formulated to meet or exceed the requirements of today's toughest standards. **PennGrade® Select** is made with a blend of high-performance synthetic base oils that are enhanced with a synergistic additive system. **PennGrade® Select** is formulated with the proper balance of detergent systems, antioxidants and dispersants to minimize harmful deposits and sludge, ensuring proper engine performance throughout the life of the oil. **PennGrade® Select** has improved compatibility with ethanol containing fuels and offers exceptional protection for catalytic emission systems. **PennGrade® Select** protects against timing chain wear and Low Speed Pre-Ignition (LSPI) found in gasoline direct injection engines.

PRODUCT FEATURES AND BENEFITS

- PennGrade® Select SAE 0W-20, 5W-30 are formulated to meet and exceed all requirements of API SQ, ILSAC GF-7A & dexos1 Gen3.
- GM Approved dexos1TM Gen 3 for 0W-20 and 5W-30 grades.
- Improved LSPI (Low Speed Pre-Ignition) protection across the drain interval.
- Enhanced cleanliness protects against harmful sludge build-up and piston deposits.
- Advanced additive technology reduces turbocharger coking on newer GDI (Gasoline Direct Injection) engines.
- Full synthetic formulation offers premium low temperature capabilities with outstanding oxidation control.

TYPICAL APPLICATIONS

PennGrade® Select is fully licensed in all of the following viscosity grades and specifications:

SPECIFICATIONS

PG Select 0W-20

API Approvals
API SQ (Backwards Compatible)
ILSAC GF-7A, Resource Conserving

OEM Approvals
dexos1™ Gen 3

Meets the Performance Requirements of:
Ford WSS-M2C972-A1

PG Select 5W-30

API Approvals
API SQ (Backwards Compatible)
ILSAC GF-6A, Resource Conserving

OEM Approvals
dexos1™ Gen 3

Meets the Performance Requirements of:
Ford WSS-M2C971-A1
Cummins CES 20109

PennGrade® Select (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	J300	0W-20	5W-30
dexos1™ Gen 3 License Number		D330BACK128	D330AACK128
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 8.43 44.2	 10.62 58.6
Viscosity Index	ASTM D2270	171	173
Pour Point, °F (°C)	ASTM D97	-43 (-42)	-32 (-36)
Flash Point, °F (°C)	ASTM D92	444 (229)	448 (231)
Sulfated Ash, Weight %	ASTM D874	0.8	0.8
Specific Gravity @ 60°F	ASTM D4052	0.8447	0.8462
CCS, @ -35°C, cP	ASTM D5293	5829	———
CCS, @ -30°C, cP	ASTM D5293	———	3886

D-A PART NUMBER

	0W-20	5W-30
Bulk	61521	61511
Tote – 330 Gal	61523	61513
Drum – 55 Gal	61522	61512
Bag-in-a-box – 6 Gal	61525	61515
Case – 4/1 Gal	61524	61514
Case – 12/1 Qt	61526	61516

PennGrade® Full Synthetic

PennGrade® Full Synthetic Motor Oil has been formulated with the latest high-tech additive technology and premium quality synthetic base oils. It is designed to meet the toughest demands of today's automotive engine technology. **PennGrade® Full Synthetic Motor Oil** has been designed to offer the highest levels of performance, engine cleanliness and protection while supporting the performance requirements of ILSAC GF-7. The product has been designed to insure quick cold weather engine start up while protecting vital engine parts and to provide exceptional protection against wear in high temperature/high stress applications. **PennGrade® Full Synthetic Motor Oil** provides excellent resistance to viscosity breakdown and foaming in modern engines.

PRODUCT FEATURES AND BENEFITS
PennGrade Full Synthetic 0W-20, 5W-20, 5W-30, & 10W-30
- Formulated to meet and exceed all requirements of API SQ & ILSAC GF-7A.

PennGrade Full Synthetic 0W-16
- Formulated to meet and exceed all requirements of API SQ & ILSAC GF-7B.

All Viscosities:
Improved LSPI (Low Speed Pre-Ignition) protection across the drain interval.
Premium cleanliness protects against harmful sludge build-up and piston deposits.
Engineered for exceptional anti-wear performance and improved fuel economy.
Full synthetic formulation offers premium low temperature capabilities with outstanding oxidation control.

TYPICAL APPLICATIONS
PennGrade® Full Synthetic is fully licensed in all of the following viscosity grades and specifications:

SPECIFICATIONS

PG Full Syn 0W-16
API Approvals
API SQ (Backwards Compatible)
ILSAC GF-7B, Resource Conserving

PG Full Syn 0W-20
API Approvals
API SQ (Backwards Compatible)
ILSAC GF-7A, Resource Conserving

Meets the Performance Requirements of:
Ford WSS-M2C972-A1

PG Full Syn 5W-20
API Approvals
API SQ (Backwards Compatible)
ILSAC GF-7A, Resource Conserving

Meets the Performance Requirements of:
Ford WSS-M2C970-A1

PG Full Syn 5W-30
API Approvals
API SQ (Backwards Compatible)
ILSAC GF-7A, Resource Conserving

Meets the Performance Requirements of:
Ford WSS-M2C972-A1

PG Full Syn 10W-30
API Approvals
API SQ (Backwards Compatible)
ILSAC GF-7A, Resource Conserving

Meets the Performance Requirements of:
Ford WSS-M2C971-A1
Cummins CES 20109

PennGrade® Full Synthetic (cont'd)

TYPICAL PROPERTIES

PennGrade® Full Synthetic is formulated to meet typical properties listed below:

SAE Viscosity Grade	J300	0W-16	0W-20	5W-20	5W-30	10W-30
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 7.00 35.23	 8.43 47.27	 8.82 48.86	 10.10 59.81	 10.26 63.28
Viscosity Index	ASTM D2270	163	170	162	157	150
HTHS @ 150°C, cPC, cP	ASTM D4683	2.3	2.6	2.7	3.1	3.2
Pour Point, °F (°C)	ASTM D97	-54 (-48)	-54 (-48)	-33 (-36)	-33 (-36)	-33 (-36)
Flash Point, °F (°C)	ASTM D92	399 (204)	401 (205)	401 (205)	397 (203)	394 (201)
Sulfated Ash, Weight %	ASTM D874	0.74	0.8	0.74	0.74	0.72
Density @ 60°F	ASTM D4052	0.8442	0.8438	0.8492	0.8493	————
CCS, cP	ASTM D5293	4587 @ -35 °C	6071 @ -35 °C	5904 @ -30 °C	6045 @ -30 °C	4238 @ -25 °C

D-A PART NUMBER

	0W-16	0W-20	5W-20	5W-30	10W-30
Bulk	62801	62811	62821	62831	N/A
Tote – 330 Gal	62803	62813	62823	62833	N/A
Drum – 55 Gal	62801	62812	62822	62832	N/A
Bag-in-a-box – 6 Gal	62805	62815	62825	62835	N/A
Case – 4/1 Gal	N/A	N/A	N/A	62834	62844
Case – 12/1 Qt	N/A	62816	62826	62836	N/A

PennGrade® Synthetic Blend

PennGrade® Synthetic Blend Motor Oils are formulated with premium base oils and the latest high-performance additive technology for gasoline engines. **PennGrade® Synthetic Blend Motor Oil** delivers a powerful combination of world class durability and industry leading fuel economy to maintain peak performance of your engine. It is designed to meet or exceed the toughest demands of new and later model gasoline engines. **PennGrade® Synthetic Blend Motor Oils** prevent lubricant starvation during cold temperature start-ups by providing improved compatibility with ethanol containing fuels. The high-tech anti-wear technology offers incredible valve train wear protection and it helps lengthen the life of catalytic emission systems. **PennGrade® Synthetic Blend Motor Oil** offers outstanding protection against harmful engine deposits and high temperature thermal breakdown.

PRODUCT FEATURES AND BENEFITS

- API Licensed for service category SP/SN PLUS/SN.
- SAE 5W-20, 5W-30, 10W-30 Are Formulated to Meet and Exceed all requirements of ILSAC GF-6A.
- Utilizes a synthetic blend base oil to improve temperature control in engines.
- Formulated with premium base oils and the latest high-tech additive technology for gasoline engines.
- Delivers a powerful combination or world class durability to maintain peak performance of your engine.
- Designed to meet or exceed the toughest demands of new and high mileage gasoline engines.

TYPICAL APPLICATIONS

PennGrade® Synthetic Blend is fully licensed in all of the following viscosity grades and specifications:

SPECIFICATIONS

PG Syn Blend 5W-20

API Approvals
- API SP
- API SN Plus
- API SN
- ILSAC GF-6A, Resource Conserving

Meets the Performance Requirements of:
- Ford WSS-92C960-A1
- Ford WSS-M2C945-B1

PG Syn Blend 10W-30

API Approvals
- API SP
- API SN Plus
- API SN
- ILSAC GF-6A, Resource Conserving

PG Syn Blend 5W-30

API Approvals
- API SP
- API SN Plus
- API SN
- ILSAC GF-6A, Resource Conserving

Meets the Performance Requirements of:
- Ford WSS-M2C961-A1
- Ford WSS-M2C946-B1

PennGrade® Synthetic Blend (cont'd)

TYPICAL PROPERTIES

PennGrade® Synthetic Blend is formulated to meet typical properties listed below:

SAE Viscosity Grade	J300	5W-20	5W-30	10W-30
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 8.83 51.71	 11.29 68.16	 10.99 69.89
Viscosity Index	ASTM D2270	150	159	143
Pour Point, °F (°C)	ASTM D97	-53 (-47)	-53 (-47)	-47 (-44)
Flash Point, °F (°C)	ASTM D92	397 (203)	399 (204)	401 (205)
Sulfated Ash, Weight %	ASTM D874	0.81	0.78	0.84
Specific Gravity @ 60°F	ASTM D4052	0.8554	0.8574	0.8616
CCS @ -30°C, cP	ASTM D5293	5481	5864	————
CCS @ -25°C, cP	ASTM D5293	————	————	4487

D-A PART NUMBER

	5W-20	5W-30	10W-30
Bulk	62711	62721	62731
Tote – 330 Gal	62713	62723	62733
Drum – 55 Gal	62712	62722	62732
Bag-in-a-box – 6 Gal	62715	62725	62735
Case – 4/1 Gal	N/A	62724	62734
Case – 12/1 Qt	62716	62726	62736

SynSure 2™

D-A **SynSure 2**™ synthetic lubricants are transportation industry-oriented gear oils which focus on the critical needs of heavy-duty truck transmissions and differentials. D-A **SynSure 2**™ provides superior lubricant protection in the most severe service, including sub-arctic to desert conditions. **SynSure 2**™ is ideal for use in truck transmissions and axles operating in standard drain service or in "out-of-warranty" situations. D-A **SynSure 2**™ out-performs conventional gear lubricants to promote longer gear life and better equipment operating economy.

PRODUCT FEATURES AND BENEFITS

D-A **SynSure 2**™ SAE 75W-90 and SAE 80W-140

- Extreme pressure API GL-5 synthetic gear lubricants providing excellent lubricant flow at all operating temperatures, including sub-zero service.
- Contain extreme pressure additives as well as rust and oxidation inhibitors to provide superior gear and bearing protection under a wide range of operating conditions.
- Extremely high film strength and outstanding low temperature performance ensure extra gear life in the toughest service.
- Resist oxidation even during the hottest climatic conditions to last significantly longer than conventional gear oils.

D-A **SynSure 2**™ SAE 50

- An SAE 50 heavy-duty manual transmission lubricant containing all synthetic components to extend lubricant service life and transmission drain intervals.
- Superior lubricating and frictional characteristics improve fuel mileage and give better operating performance when used in manual transmissions.
- Provides excellent performance over a wide temperature range including sub-zero service, promoting smoother, easier shifting.
- The additive package provides corrosion protection and is safe for bronze, copper and steel components.

TYPICAL APPLICATIONS

D-A **SynSure 2**™ SAE 75W-90 and SAE 80W-140

- Heavy duty manual transmissions, axles and final drives requiring API GL-5 & MT-1 performance.
- On-highway light and heavy-duty trucks, buses and vans.
- Off-highway equipment including: construction, mining, quarry applications and agriculture.
- Heavy-duty industrial gear drives including hypoid gears.
- Differentials, final drives, transfer cases and other gear applications where lubricants meeting SAE J2360 (MIL-PRF-2105E),
- API Service GL-5, EP gear lubricants are recommended.
- Recommended for equipment such as winch reduction gears and crawler vehicle propulsion gear drives that are exposed to severe low temperatures.
- Use as a companion with D-A **SynSure 2**™ SAE 50 in transmissions for maximum drivetrain life and fuel economy improvement.

D-A **SynSure 2**™ SAE 50

- Heavy duty manual transmissions where extended service intervals are required.
- On-highway commercial light and heavy duty trucking, buses and vans.
- Off-highway equipment including: construction, mining and agriculture.

SynSure 2™ (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	75W-90	80W-140	50
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 16.2 111	 29.0 255	 17.6 120
Viscosity Index	ASTM D2270	156	150	162
Pour Point, °F (°C)	ASTM D97	-51 (-46)	-33 (-36)	-53 (-47)
Flash Point, °F (°C)	ASTM D92	410 (210)	410 (210)	437 (210)
API Gravity	ASTM D4052	N/A	N/A	24.0
FZG Test, Pass Stage	ASTM D5182	N/A	N/A	10

D-A PART NUMBER

	75W-90	80W-140	50
Bulk	14611	14621	14601
Tote – 330 Gal	14613	14623	14603
Drum – 400 lb	14612LB	14622LB	14602LB
Qtr Drum – 120 lb	14616LB	14626LB	14606LB
Pail (Plastic) – 35 lb	14618LB	14628LB	14608LB

ProDrive - A™

D-A **ProDrive - A**™ is a full synthetic automatic transmission fluid built upon a robust formulation meeting the stringent requirements for fluid stability, lubrication, and cold operation. **ProDrive - A**™ is recommended for use in various on-highway Allison transmission such as Allison 1000 Series™, 2000 Series™, 3000 Series™, 4000 Series™ and H 40/50 EP™ where an Allison TES 668® approval is required. **ProDrive - A**™ builds upon the requirements of TES 295® while maintaining the durability and extended drain performance. Allison recommends that all TES 295®, TES 389™,and TES 468™ users transition to TES 668®.

PRODUCT FEATURES AND BENEFITS

- Extended anti-shudder durability for smooth and steady operation
- Extended clutch friction durability for consistent gear change
- Superb oxidation performance to support extended drains
- Excellent gear protection for long transmission service life
- Full synthetic formulations offering optimal cold temperature performance and protection

TYPICAL APPLICATIONS

Approved to:
Allison TES 668® - Approval Number 668-10502024
Meets the performance requirements of:
Allison TES 295®
Ford P/N XT-2-QDX
MAN 339 Type V1
Allison TES 389B™
Ford P/N XT-5-QM
Voith H55.6335.xx
Daimler DTFR 13C190 (prev. MB236.92)
GM D-IIIH / IIIG / IID
Volvo 97340
DANA-OHTM ATF-X
JASO M315 Type 1A
Volvo 97341

TYPICAL PROPERTIES

Test	Method	Property
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 6.9 34.3
Viscosity Index	ASTM D2270	166
Brookfield Viscosity @ -40°C, cP	ASTM D2983	11,500
Pour Point, °F (°C)	ASTM D5950	<-60 (-51)
Flash Point, °F (°C)	ASTM D92	410 (210)
Density, g/mL	ASTM D4052	0.851

D-A PART NUMBER

Tote – 275 Gal	54677
Drum – 55 Gal	54672
Pail (Plastic) – 5 Gal	54678

ProDrive - E™

D-A **ProDrive – E**™ synthetic transmission fluid is an Eaton approved, uniquely formulated synthetic lubricant designed for fuel efficiency, extended drain intervals and severe service in heavy duty commercial vehicles. This non-EP lubricant provides excellent resistance to wear, temperature extremes and corrosion. D-A **ProDrive – E**™ is recommended for use in commercial vehicles with Eaton transmission models such as Endurant, Ultrashift Plus, Fuller Advantage, and FR and RT Series transmissions where an approved fluid is required.

PRODUCT FEATURES AND BENEFITS

- Provides up to 1.5 % fuel economy improvement while maintaining excellent shear stability.
- Enables high performance and extended drain capabilities.
- Resists deposit and sludge formation with excellent thermal and oxidation stability.
- Provides protection from corrosion, foaming, rust, and wear.
- Supports low and high temperature extremes.
- Ensures friction retention, friction durability, and excellent shear stability to maintain smooth transmission operations throughout the extended drain interval.

TYPICAL APPLICATIONS

ProDrive – E™ is recommended for use in Eaton transmission models such as Endurant, Ultrashift Plus, Fuller Advantage, and FR and RT Series transmissions where an approved fluid is required. Common commercial vehicle applications include line-haul, vocational, off-road, pick-up and delivery, and charter buses.

APPROVALS AND SPECIFICATIONS

API Service Category MT-1
OEM Approvals:
Eaton PS-386
Mack TO-A Plus
Meritor O-81
Navistar MPAPS B-6816 Type II

TYPICAL PROPERTIES

SAE Viscoity Grade	SAE J300 SAE J306	40 75W-90
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 14.8 95.1
Viscosity Index	ASTM D2270	163
Viscosity @ -40°C, cP	ASTM D2983	51,900
Pour Point, °F (°C)	ASTM D97	-43 (-42)
Flash Point, °F (°C)	ASTM D92	460 (238)
API Gravity @ 15.6°C, degrees	ASTM D1298	35.0
Density @ 15.6°C, LB/GAL US	ASTM D1298	7.09

D-A PART NUMBER

Drum – 55 Gal	14432
Pail (Plastic) – 5 Gal	14438

ProDrive 2™

D-A **ProDrive 2**™ full synthetic transmission fluids are designed for fuel efficiency, extended drain intervals and severe service in heavy duty commercial vehicle transmissions. This non-EP lubricant provides excellent resistance to wear, temperature extremes and corrosion. **ProDrive 2**™ is recommended for heavy-duty manual and automated manual transmission seeking to extend lubricant service life and transmission drain intervals.

D-A **ProDrive 2**™ is ideal for use in truck transmissions operating in standard drain service or in "out-of-warranty" situations. It out-performs conventional gear lubricants to promote longer life and decrease equipment operating expense.

PRODUCT FEATURES AND BENEFITS
- Strong shear resistances enables **ProDrive 2**™ to stay in grade and extend service intervals
- Resists deposit and sludge formation with excellent thermal and oxidation stability.
- Excellent corrosion protection and is safe for bronze, copper and steel.
- Full synthetic formulation supports low and high temperature extremes.

TYPICAL APPLICATIONS
D-A **ProDrive 2**™ is recommended for heavy duty manual and automated-manual transmissions where extended service intervals of up to 500,000 miles are required.

On-highway applications include: commercial light and heavy duty trucking, buses and vans.
Off-highway applications include: construction, mining and agriculture.

Meets the known performance requirements for OEMs such as Eaton, Mack, Meritor, Navistar, and Volvo in addition to API Service Categories GL-4 and MT-1.

TYPICAL PROPERTIES

SAE Viscoity Grade	SAE J300 SAE J306	30 75W-85	40 75W-90	50
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 10.75 67.27	 14.05 96.77	 17.61 139.8
Viscosity Index	ASTM D2270	150	148	139
Pour Point, °F (°C)	ASTM D97	-45 (-43)	-47 (-44)	-40 (-40)
Flash Point, °F (°C)	ASTM D92	452 (233)	457 (236)	480 (249)
Density @ 15.6°C, LB/GAL US	ASTM D1298	7.18	7.19	7.21
Copper Corrosion	ASTM D130	1B	1B	1B
FZG Test, Pass Stage	ASTM D5182	10	10	10

D-A PART NUMBER

	30/75W-85	40/75W90	50
Bulk	N/A	N/A	14601
Tote – 330 Gal	14693	14683	14603
Drum – 400 lb	14692LB	14682LB	14602LB
Qtr Drum – 120 lb	N/A	N/A	14606LB
Pail (Plastic) – 35 lb	14698LB	14688LB	14608LB

AutoTrans Super Plus™

AutoTrans Super Plus™ is a fully synthetic high viscosity automatic transmission fluid that supports the performance requirements in a vast majority of today's automatic transmissions, including Allison, BMW, Honda, Ford, Mercedes Benz, Mitsubishi, Nissan, Toyota, Volkswagen, Voith, Volvo, ZF, and many others. **AutoTrans Super Plus**™ is suitable for severe service applications (up to 50,000 miles) and for extended drain intervals in normal service applications (up to 100,000 miles). It offers excellent corrosion resistance to all types of metals used in transmissions and hydraulic systems, plus provides superior friction retention and thermal and oxidation stability. **AutoTrans Super Plus**™ can be used in a broad variety of multi-vehicle applications found in on- and off- highway service as well as marine and industrial applications.

PRODUCT FEATURES AND BENEFITS

- Friction modifiers control lock-up rates of clutch packs for proper transmission shifting characteristics and efficient power transfer.
- Controls seal deterioration to limit fluid leakage.
- Specifically formulated for extra wear control and rust protection for longer equipment life.
- Special detergent/dispersant additives limit formation of sludge and varnish deposits which interfere with proper transmission operation.
- Multi-grade for optimum performance during cold starts and high temperature operations, including start/stop severe service.
- Formulated to be compatible with the metallurgy used in most modern transmissions and high-pressure hydraulic systems.
- Provides efficient heat removal from clutch surfaces to extend clutch life and reduce clutch shudder in modulated torque converters.
- Full synthetic for longer fluid life and faster oil flow in low temperature operation.

TYPICAL APPLICATIONS

Supports the performance requirements of:

Aisin Warner AW-1
Aisin Warner JWS3309
Allison C-4
Allison TES 295[1]
Allison TES 389B[1]
Audi/VW TL 052 162
Audi/VW TL 052 990
Audi/VW TL 055 025-A
Audi/VW Porsche
000.043.204.63
000.043.205.28
BMW 83 22 0 026 922
BMW 83 22 9 407 807
BMW MINI 83 22 7 542 290
Daihatsu Ammix D-III ATF
FCA ATF+4
FCA MOPAR AS68 / 69RC
FCA Chrysler MS-1872
FCA Chrysler MS-5931
FCA Chrysler MS-108388
Ford WSS-M2C924-A
Ford Merc V
Ford FNR5
Ford WSS-M2C138
Ford WSS-M2C922
Ford XL-12
Ford WSS-M2C195-A
GM Auto Trak II
GM IID, GM IIIF, GM IIIG
GM IIIH, GM III
GM T-IV Transmission Fluid
GM ATF Saturn T-IV
GM AW-1 Transmission Fluid
GM TASA
GM Power Steering Fluid
GM 9985010
GM 9985835
Honda ATF-Z1
Hyundai/KIA Red-1
Hyundai/KIA JWS 3314
Hyundai/KIA JWS 3317
Hyundai/KIA SP-II
Hyundai/KIA SP-III
Hyundai/KIA PSF-3
Jaguar WSS-M2C922-A1
JASO 1-A
Jatco Texaco 402
Jatco 3100 PL085
MAN 339-V-1
MAN 339-Z-1
MAN 339F
Mazda M-III
Mazda M-V
Mercedes Benz 236.1
Mercedes Benz 236.10
Mercedes Benz 236.11
Mercedes Benz 236.2
Mercedes Benz 236.3
Mercedes Benz 236.5
Mercedes Benz 236.6
Mercedes Benz 236.7
Mercedes Benz 236.81
Mercedes Benz 236.9
Mercedes Benz 236.91
Mercedes Benz GL-450
Mitsubishi SP-II

AutoTrans Super Plus™ (cont'd)

TYPICAL APPLICATIONS (cont'd)

Mitsubishi SP-III
Mitsubishi Diamond SP-III
Mitsubishi Dia Queen
ATF J2
Mitsubishi PS Fluid
Nissan Matic C
Nissan Matic D
Nissan Matic J
Nissan Matic K
Nissan PSF-II
North American OEM
High Viscosity ATF
PSA B71 2340
Renault DP-0
Saab 93165147
Saab Power Steering Fluid 2634
Subaru ATF
Subaru ATF HP
Subaru Power Steering Fluid
Suzuki 3314
Suzuki 3317
Toyota T Toyota T-1, T-II & T-III
Toyota T-IV
Toyota PSF Type EH
Voith H55.6335
Volvo 1161621 & 1161521
Volvo 1161640 & 1161540
Volvo 31256774
Volvo P/N 97340
Volvo AT 101 (P/N 97341)
ZF LifeGuard Fluid 5
ZF TE-ML 03D
ZF TE-ML 04D
ZF TE-ML 05L
ZF TE-ML 09
ZF TE-ML 11 (3 and 4 speeds)
ZF TE-ML 14A
ZF TE-ML 16L
ZF TE-ML 17C
ZF TE-ML 21L

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[1]The ability of D-A to claim suitable for use for any specification does not imply that these products are sponsored, approved, licensed or affiliated with Allison Transmission. This claim states that through testing we have determined that AutoTrans Super Plus™ meets the known performance requirements of the TES 295® and TES 389B® specifications.

NOTE: ATF recommendations may vary between models from manufacturer. Please consult the owner's manual for the correct fluid recommendations.

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 7.2 34.0
Viscosity Index	ASTM D2270	180
Pour Point, °F (°C)	ASTM D97	-473 (-44)
Flash Point, °F (°C)	ASTM D92	400 (204)
API Gravity, 60°F	ASTM D287	34.6

D-A PART NUMBER

Bulk	54561
Tote – 330 Gal	54563
Drum – 55 Gal	54562
Pail (Metal) – 5 Gal	54569
Pail (Plastic) – 5 Gal	54568
Case – 12/1 Qt	54566
Bag-in-a-box - 6 Gal	54565

AutoTrans Super LV™

AutoTrans Super LV™ is a low viscosity, fully synthetic, automatic transmission fluid that supports performance requirements of today's newer automatic transmissions, including General Motors, Honda, Hyundai, Ford, Kia, Mitsubishi, Nissan, Saab, Toyota, Volkswagen and others. **AutoTrans Super LV**™ is suitable for severe service applications (up to 50,000 miles) and for extended drain intervals in normal service applications (up to 100,000 miles). It offers excellent corrosion resistance to all types of metals used in transmissions, plus provides superior friction retention and thermal and oxidation stability. **AutoTrans Super LV**™ can be used in a broad variety of multi-vehicle applications found in on- and off-highway service as well as marine and industrial applications.

PRODUCT FEATURES AND BENEFITS

- Friction modifiers control lock-up rates of clutch packs for proper transmission shifting characteristics and efficient power transfer.
- Controls seal deterioration to limit fluid leakage.
- Specifically formulated for extra wear control and rust protection for longer equipment life.
- Special detergent/dispersant additives limit formation of sludge and varnish deposits which interfere with proper transmission operation.
- Multi-grade for optimum performance during cold starts and high temperature operations, including start/stop severe service.
- Formulated to be compatible with the metallurgy used in most modern transmissions.
- Provides efficient heat removal from clutch surfaces to extend clutch life and reduce clutch shudder in modulated torque converters.
- Full synthetic for longer fluid life and faster oil flow in low temperature operation.

TYPICAL APPLICATIONS

Supports the performance requirements of:

Aisin Warner 3324
Aisin Warner AW-1
Audi/VW TL 052 162-X
Audi/VW TL 052 162-Y
Audi/VW TL 052 540-B
BMW 83 22 0 142 516
BMW 83 22 2 289 720 (ATF+3)
BMW 83 22 0 397 114
DSIH 6p805
Dexron® VI
Ford Mercon® LV
Ford Mercon® SP
FCA Mopar SP-IV ATF
GM WS-ATF
Honda Type 3.0
Honda ATF DW-1
Hyundai/KIA SP-IV
Hyundai/KIA SP-IV-RR
Hyundai/KIA NWS 9638
Hyundai/KIA SP-IV M
Hyundai/KIA SPH-IV
Isuzu SCS
Jaguar Fluid 8432
JASO 1-A-LV
MB 236.12
MB 236.14
MB 236.15
MB 236.16
MB 236.17
Mitsubishi ATF J2
Mitsubishi SP-IV
Mitsubishi Dia Queen ATF J3
Mitsubishi Dia Queen ATF-PA
Nissan Matic S
Nissan Matic W
North American Low Viscosity ATF
Saab 93 165 147
Toyota WS (JWS 3324)
Volvo AT102 (P/N 97342)
VW G-055-540
ZF LifeGuard Fluid 6
ZF LifeGuard Fluid 6+

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NOTE: ATF recommendations may vary between models from manufacturer. Please consult the owner's manual for the correct fluid recommendations.

AutoTrans Super LV™ (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 5.80 28.4
Viscosity Index	ASTM D2270	155
Pour Point, °F (°C)	ASTM D97	-52 (-46)
Flash Point, °F (°C)	ASTM D92	380 (193)
API Gravity, 60°F	ASTM D287	33.9

D-A PART NUMBER

Bulk	54581
Tote – 330 Gal	54583
Drum – 55 Gal	54582
Case – 12/1 Qt	54586
Bag-in-a-box - 6 Gal	54585

AutoTrans Multi-Vehicle

AutoTrans Multi-Vehicle is a low viscosity automatic transmission fluid that supports performance requirements of today's newer automatic transmissions, including General Motors, Honda, Hyundai, Ford, Kia, Mitsubishi, Nissan, Saab, Toyota, Volkswagen and others. **AutoTrans Multi-Vehicle** is suitable for severe service applications (up to 50,000 miles) and for extended drain intervals in normal service applications (up to 100,000 miles). It offers excellent corrosion resistance to all types of metals used in transmissions, plus provides superior friction retention and thermal and oxidation stability. **AutoTrans Multi-Vehicle** can be used in a broad variety of multi-vehicle applications found in on- and off-highway service as well as marine and industrial applications.

PRODUCT FEATURES AND BENEFITS

- Friction modifiers control lock-up rates of clutch packs for proper transmission shifting characteristics and efficient power transfer.
- Controls seal deterioration to limit fluid leakage.
- Specifically formulated for extra wear control and rust protection for longer equipment life.
- Special detergent/dispersant additives limit formation of sludge and varnish deposits which interfere with proper transmission operation.
- Multi-grade for optimum performance during cold starts and high temperature operations, including start/stop severe service.
- Formulated to be compatible with the metallurgy used in most modern transmissions.
- Provides efficient heat removal from clutch surfaces to extend clutch life and reduce clutch shudder in modulated torque converters.

TYPICAL APPLICATIONS

Supports the performance requirements of:

Aisin JWS 3309 ATF, 3324 ATF
Aisin Warner AW-2, 0T4 ATF, ATF-0WS
Allison C2, C3, C4
Audi/VW G 055 005 A2 (tan)
Audi/VW G 060 162A2 (green or blue)
BMW 83 22 0 142 516
BMW 83 22 2 289 720 (ATF+3)
BMW 83 22 0 397 114
Daihatsu D3-SP
FCA Mopar SP-IV
Ford MERCON® LV
Ford MERCON® SP
Ford MERCON ULV
GM DEXRON VI
Honda Type 3.0, 3.1
Honda ATF DW-1
Hyundai/KIA SP-IV M
Hyundai/KIA SP-IV-RR
Hyundai/KIA 9638
Isuzu SCSA
Isuzu ATF II, III, WSI
Jaguar Fluid 8432
JASO 1-A-LV
Rover AW-1
MAN 339 A, D, F
Maserati Oil No. 231603
Mazda ATF -A7 Volvo AT102 (P/N 97342)
Mazda Type T-IV 3309
MB 236.1, 236.5, 236.6, 236.1
MB 236.12, 236.14, 236.17236.82
Mitsubishi ATF J2, J3
Mitsubishi Dia Queen ATF-MA1
Mitsubishi Dia Queen ATF-PA
Nissan Fluid A
Nissan Matic D, J, K, P, R, S W
Peugeot PSA 16 350 560, 80
Porsche LT 17741
Renault DP-0
Saab ATF HP
Saab 93 165 147
Subaru ATF HP, WS
Toyota WS (JWS 3309, 3324)
Toyota Type D-II
Toyota Type T, T-II, T-III
ZF Lifeguard Hybrid 1
ZF Lifeguard Fluid 5, 6, 8, 9
ZF TE-ML 11A
ZF TE-ML 11B

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AutoTrans Multi-Vehicle (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 6.2 31.9
Viscosity Index	ASTM D2270	147
Pour Point, °F (°C)	ASTM D97	-52 (-46)
Flash Point, °F (°C)	ASTM D92	380 (193)
API Gravity, 60°F	ASTM D287	33.9

D-A PART NUMBER

Bulk	54661
Tote – 330 Gal	54663
Tote – 275 Gal	54667
Bag-in-a-box - 6 Gal	54665
Case – 12/1 Qt	54666

AutoTrans G-3™

AutoTrans G-3™ is an automatic transmission fluid (ATF) that meets on-highway performance requirements for Dexron® III H, Allison Type C-4 and Ford Mercon®. It offers excellent corrosion resistance to all types of metals used in transmissions and hydraulic systems, plus provides superior friction retention and thermal and oxidation stability. **AutoTrans G-3**™ can be used in a broad variety of multi-vehicle applications found in on- and off-highway service as well as marine and industrial applications.

PRODUCT FEATURES AND BENEFITS

- Friction modifiers control lock-up rates of clutch packs for proper transmission shifting characteristics and efficient power transfer.
- Controls seal deterioration to limit fluid leakage.
- Specifically formulated for extra wear control and rust protection for longer equipment life.
- Special detergent/dispersant additives limit formation of sludge and varnish deposits which interfere with proper transmission operation.
- Multi-grade for optimum performance during cold starts and high temperature operations.
- Formulated to be compatible with the metallurgy used in most modern transmissions and high-pressure hydraulic systems.
- Provides excellent anti-wear protection for hydraulic pumps and power steering systems.

TYPICAL APPLICATIONS

Dexron® III H
Dexron® III G
Dexron® II D
Allison C-4
Allison TES 389B[1]
Domestic and imported passenger cars and light trucks
GMC
Ford MERCON®
Type A Suffix A (TSAS)
Mercedes Benz in North America

Dexron® is a trademark of General Motors Inc.
Mercon® is a trademark of the Ford Motor Company.

[1]The ability of D-A to claim suitable for use for any specification does not imply that these products are sponsored, approved, licensed or affiliated with Allison Transmission. This claim states that through testing we have determined that AutoTrans G-3™ meets the known performance requirements of the TES 389B® specification.

NOTE: ATF recommendations may vary between models from manufacturer. Please consult the owner's manual for the correct fluid recommendations.

AutoTrans G-3™ (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 7.16 32.7
Viscosity Index	ASTM D2270	191
Pour Point, °F (°C)	ASTM D97	-40 (-40)
Flash Point, °F (°C)	ASTM D92	395 (202)
API Gravity, 60°F	ASTM D287	33.8

D-A PART NUMBER

Bulk	54501
Tote – 330 Gal	54503
Drum – 55 Gal	54502
Bag-in-a-box – 6 Gal	54505
Pail (Metal) – 5 Gal	54509
Pail (Plastic) – 5 Gal	54508
Case – 12/1 Qt	54506

TorGuard™

D-A **TorGuard**™ is designed to meet the lubrication needs of heavy-duty automatic and powershift transmissions requiring Caterpillar TO-4 or Allison C-4 fluids. It is designed with outstanding friction control characteristics to minimize clutch slippage thus allowing complete power transfer for maximum equipment productivity. D-A **TorGuard**™ is fully compatible with fluoroelastomer friction material. This product is formulated with quality base oils and carefully selected additives resulting in a product which will provide maximum anti-wear protection and prevent glazing on friction surfaces. Special inhibitors are also present which limit oil oxidation even at high operating temperatures. Additionally, its fluid flow properties and elastomer seal compatibility make it an ideal hydraulic system lubricant when transmission fluid or engine oil products are recommended.

PRODUCT FEATURES AND BENEFITS

- Full fluoroelastomer compatibility provides longer friction disc life, reduced downtime and lower maintenance costs.
- Unique heavy duty transmission formulation controls sludge and varnish deposits to maintain a clean, efficient transmission.
- High quality base oils and antioxidant additives produce a lubricant with minimal viscosity change and excellent resistance to high temperature degradation for longer lubricant life.
- Thermally stable chemistry maintains proper friction retention between transmission and wheel brake friction disc assemblies.
- Full compatibility with diesel engine oil prevents potential damage resulting from accidentally mixing with engine oil in crankcase or transmission.
- Extra rust and corrosion additives protect mechanical components even if fluid is contaminated with water.

TYPICAL APPLICATIONS

Transmissions/Torque Converters/Final Drives
Caterpillar Powershifts, TO-4
Caterpillar Drive Trains, TO-4
Allison Automatics
Allison Powershifts
Sundstrand Hydrostatics
Komatsu Dresser
Dana Powershift

Hydraulic Systems and Pumps
Vane
Axial Piston
Gear
Caterpillar hydraulic systems, where TO-4 fluids are recommended

Meets or exceeds the requirements of:
Allison C-4
Caterpillar TO-4
Komatsu KES 07.868.1
Link Belt
ZF TE ML 03C
ZF TE ML 07F

TorGuard™ (cont'd)

TYPICAL PROPERTIES

SAE Grade	J300	10W	30	50	60
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 6.5 40.1	 11.6 102	 19.7 227	 24.5 313
Viscosity Index	ASTM D2270	111	101	99	100
Pour Point, °F (°C)	ASTM D97	-35 (-37)	0 (-18)	10 (-12)	10 (-12)
Flash Point, °F (°C)	ASTM D92	400 (204)	445 (229)	470 (243)	520 (270)
API Gravity	ASTM D287	29.0	27.6	26.2	25.5
Copper Strip Corrosion	ASTM D130	1b	1b	1b	1b
Rust Test	ASTM D665	Pass	Pass	Pass	Pass

D-A PART NUMBER

	10W	30	50	60
Bulk	53631	53641	53651	53681
Tote – 330 Gal	53633	53643	53653	N/A
Drum – 55 Gal	53632	53642	53652	N/A
Pail (Metal) – 5 Gal	53639	53649	N/A	N/A
Pail (Plastic) – 5 Gal	53638	53648	53658	N/A
Case – 4/1	53634	N/A	N/A	N/A

TorGuard FS™

D-A **TorGuard FS**™ is designed to meet the lubrication needs of heavy-duty automatic and powershift transmissions requiring Caterpillar TO-4 or Allison C-4 fluids. D-A **TorGuard FS**™ is a full synthetic, PAO based fluid intended to provide excellent flow characteristics at low temperatures, while also providing superior film strength for transmission protection at elevated temperatures. It is designed for outstanding friction control characteristics to minimize clutch slippage thus allowing complete power transfer for maximum equipment efficiency.

D-A **TorGuard FS**™ is fully compatible with fluoroelastomer friction material. This product is formulated with quality synthetic base oils and carefully selected additives resulting in a product which will provide maximum anti-wear protection and prevent glazing on friction surfaces. Special inhibitors are also present which limit oil oxidation even at high operating temperatures. Additionally, its fluid flow properties and elastomer seal compatibility make it an ideal hydraulic system lubricant when transmission fluid or engine oil products are recommended.

PRODUCT FEATURES AND BENEFITS

- Full fluoroelastomer compatibility provides longer friction disc life, reduced downtime and lower maintenance costs.
- Unique heavy duty transmission formulation controls sludge and varnish deposits to maintain a clean, efficient transmission.
- High quality synthetic base oils and antioxidant additives produce a lubricant with superb viscosity control and excellent resistance to high temperature degradation for longer lubricant life.
- Thermally stable chemistry maintains proper friction retention between transmission and wheel brake friction disc assemblies.
- Full compatibility with diesel engine oil prevents potential damage resulting from accidentally mixing with engine oil in crankcase or transmission.
- Extra rust and corrosion additives protect mechanical components even if fluid is contaminated with water.

TYPICAL APPLICATIONS

Transmissions/Torque Converters/Final Drives
Caterpillar Powershifts, TO-2 and TO-4
Caterpillar Drive Trains, TO-2 and TO-4
Allison Automatics
Allison Powershifts
Sundstrand Hydrostatics

Rotary Air Compressors
Vane
Screw

Hydraulic Systems and Pumps
Vane
Axial Piston
Gear
Caterpillar hydraulic systems, where TO-4 fluids are recommended

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	30
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 11.3 67.5
Viscosity Index	ASTM D2270	162
Pour Point, °F (°C)	ASTM D97	-58 (-50)
Flash Point, °F (°C)	ASTM D92	455 (235)
API Gravity	ASTM D4052	33.5

TorGuard FS™ (cont'd)

D-A PART NUMBER	
Bulk	54141
Tote – 330 Gal	54143
Drum – 55 Gal	54142

TorGuard FD™

D-A **TorGuard FD**™ are performance engineered lubricants designed specifically for final drive axle oil (FDAO) type applications that require the Caterpillar FD-1 specification.

D-A **TorGuard FD**™ when used under normal operating conditions, can have drain intervals up to 3,000 operating hours. Special additives are added to control foaming tendencies while deterring pitting and scuffing within gears and bearings. In addition, the robust additive package controls rust and exhibits very good oxidation stability to combat contact fatigue within the drive system.

D-A **TorGuard FD**™ is not recommended for final drive components that contain frictional materials such as wet disk systems.

PRODUCT FEATURES AND BENEFITS

- Longer bearing and gear life.
- Protects against pitting, wear, and scuffing for gears and bearings.
- Superior wear protection under high torque, low speed operating conditions.
- Improved protection against rust and corrosion.
- Excellent oxidation stability to reduce deposits and minimize viscosity oxidative thickening throughout the drain cycle.
- Reduced foaming tendencies result in lower wear rates in high- pressure contact areas.

TYPICAL APPLICATIONS

D-A **TorGuard FD**™ are performance engineered lubricants designed specifically for final drive and axle (FDAO) type applications that require the Caterpillar FD-1 specification.

D-A **TorGuard FD**™ is recommended for use in selected models and compartments such as: forestry equipment, off-highway trucks and track-type tractors.

In applications where **TorGuard FD**™ is recommended, the factory fill oil for standard configured machines is SAE 60 however, Machine Operating Manuals should be consulted to select the appropriate grade for prevailing ambient temperatures.

D-A **TorGuard FD**™ may be used in any other equipment that requires fluids meeting the Caterpillar FD-1 specification.

TorGuard FD™ (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	60
Viscosity @ 100 °C, cSt @ 40 °C, cSt	 ASTM D445 ASTM D445	 25.45 332.7
Viscosity Index	ASTM D2270	99
Pour Point, °F (°C)	ASTM D97	-2 (-19)
Flash Point, °F (°C)	ASTM D92	>478 (>248)
Copper Strip Corrosion	ASTM D130	1b
FZG Test, Pass Stage	ASTM D5182	12
API Gravity	ASTM D4052	26.1

D-A PART NUMBER

Bulk	53161
Tote – 330 Gal	53163

HydraTrans LV™

D-A **HydraTrans LV**™ is a proven premium grade transmission and hydraulic fluid providing superior performance for severe service off-highway applications. It is formulated from high-quality base stocks fortified with a high-performance additive system to extend component life and improve performance characteristics. D-A **HydraTrans LV**™ supports the performance requirements for most major agricultural equipment manufacturers, allowing users to stock one fluid to meet both transmission and hydraulic system needs. D-A **HydraTrans LV**™ is a lower viscosity tractor fluid designed for service in both hydraulic and transmission field systems in major construction and agricultural equipment.

PRODUCT FEATURES AND BENEFITS

- Formulated with high-quality, full synthetic base oils.
- Improves hydraulic pump and gear train life to help reduce maintenance costs.
- Extremely Shear stable viscosity index improver.
- Strong viscosity retention across drain interval.
- Improved oxidation stability extends oil life.
- Improved frictional properties prevent grabbing or chattering of wet brakes and PTO clutches.
- Excellent water tolerance and low temperature fluidity.
- Provides protection in all working environments.
- Provides rust and corrosion protection for all types of surfaces, increasing component life.
- Supports the performance requirements of both hydraulic and transmission field service for major construction and agricultural equipment manufacturers reducing the need to inventory separate lubricants.

TYPICAL APPLICATIONS

API GL-4
CNH
MAT 3525
John Deere
JDM J20C, J20D
Massey
CMS M1135, M1141
CMS M1143, M1145
Volvo
WB101
ZF
TE-ML-03E
TE-ML-05F
TE-ML-06K
TE-ML-17E

TYPICAL PROPERTIES

HydraTrans LV™	Test Method	
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 6.93 34.10
Viscosity Index	ASTM D2270	169
Pour Point, °F (°C)	ASTM D97	-54 (-48)
Flash Point, °F (°C)	ASTM D92	430 (221)
API Gravity	ASTM D4052	34.3

D-A PART NUMBER

Bulk	57521
Tote – 330 Gal	57523
Drum – 55 Gal	57522
Pail (Plastic) – 5 Gal	57528

HydraTrans 155 EX™

D-A **HydraTrans 155 EX**™ is a proven premium grade, high viscosity transmission and hydraulic fluid providing superior performance for severe service off-highway and agriculture applications. It is formulated from high-quality base stocks fortified with a high-performance additive system to extend component life and improve performance characteristics. D-A **HydraTrans 155 EX**™ supports the performance requirements for most major construction and agricultural equipment manufacturers, allowing users to stock one fluid to meet both transmission and hydraulic system needs.

PRODUCT FEATURES AND BENEFITS

- Improves hydraulic pump and gear train life to help reduce maintenance costs.
- Improved oxidation stability extends oil life.
- Improved frictional properties prevent grabbing or chattering of wet brakes and PTO clutches.
- Excellent water tolerance and low temperature fluidity provides protection in all working environments.
- Provides rust and corrosion protection for all types of metal surfaces, increasing component life.
- Supports the performance requirements of both hydraulic and transmission field service for major construction and agricultural equipment manufacturers reducing the need to inventory separate lubricants.

TYPICAL APPLICATIONS

AGCO
- AGCO Power Fluid 821XL®
- Allis Power Fluid 821®
- Deutz-Allis 272843, 257541, 246634
- Massey Ferguson M1135, M1141, M1143, M1145
- Massey Ferguson M1110, M1127A/B, M1129A

Allison C-3, C-4
API GL-4
CNH
- ESN-M2C134-A, B, C, D
- ESN-M2C41-B
- ESN-M2C43
- ESN-M2C86B, C
- MAT 3505/MS-1209 (Ultra)
- MAT 3525/FNHA-2C-201
- MAT 3526/FNHA-2C-200A
- JIC 143/144, 145, 185
- MS-1204, 1206, 1207, 1209, 1210

White Farm/MM/Oliver/New Idea
- Q-1705
- Q-1722, 1766, 1766B
- Q-1802
- Q-1826
- Type 55

ZF
- TE-ML 03E, TE-ML 03F
- TE-ML 05E, TE-ML 05F
- TE-ML 06K

Denison HF-0, HF-1, HF-2
Hesston-Fiat Multi-F, Multi-G
JCB
John Deere
- JDM J14B, J14C
- JDM J20A, J20B
- JDM J20C, J20D
- JDM J21A

Komatsu and Komatsu Dresser
- B-06-001, B-06-0002

Kubota UDT
Leyland
Link Belt
Sauer Sundstrand
Sperry-Vickers I-286-S, M-2950-S
Sundstrand Hydraulics (Plessey)
Vickers 35VQ25, M-2952-S
Volvo WB101

TYPICAL PROPERTIES

HydraTrans 155 EX™	Test Method	
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 9.96 51.18
Viscosity Index	ASTM D2270	186
Pour Point, °F (°C)	ASTM D97	-45 (-43)
Flash Point, °F (°C)	ASTM D92	424 (218)
API Gravity	ASTM D4052	31.8

D-A PART NUMBER

Bulk	57561
Tote – 330 Gal	57563

HydraTrans 135™

D-A **HydraTrans 135**™ is a proven premium grade transmission and hydraulic fluid. It provides superior performance for severe service off-highway applications. It is formulated from high-quality base stocks fortified with a high-performance additive system to extend component life and improve performance characteristics. D-A **HydraTrans 135**™ supports the performance requirements for most major construction and agricultural equipment manufacturers, allowing users to stock one fluid to meet both transmission and hydraulic system needs.

PRODUCT FEATURES AND BENEFITS

- Improves hydraulic pump and gear train life to help reduce maintenance costs.
- Improved oxidation stability extends oil life. Improved frictional properties prevent grabbing or chattering of wet brakes and PTO clutches.
- Excellent water tolerance and low temperature fluidity provides protection in all working environments.
- Provides rust and corrosion protection for all types of metal surfaces, increasing component life.
- Supports the performance requirements of both hydraulic and transmission fluid systems for major construction and agricultural equipment manufacturers.
- Reduces the need to inventory separate lubricants.

TYPICAL APPLICATIONS

AGCO
- AGCO Power Fluid 821XL®
- Allis Power Fluid 821®
- Deutz-Allis 272843, 257541, 246634
- Massey Ferguson M1135, M1141, M1143, M1145
- Massey Ferguson M1110, M1127A/B, M1129A

Allison C-3, C-4
API GL-4
CNH
- ESN-M2C134-A, B, C, D
- ESN-M2C41-B
- ESN-M2C43
- ESN-M2C86B, C
- MAT 3505/MS-1209 (Ultra)
- MAT 3525/FNHA-2C-201
- MAT 3526/FNHA-2C-200A
- JIC 143/144, 145, 185
- MS-1204, 1206, 1207, 1209, 1210

White Farm/MM/Oliver/New Idea
- Q-1705
- Q-1722, 1766, 1766B
- Q-1802
- Q-1826
- Type 55

ZF
- TE-ML 03E, TE-ML 03F
- TE-ML 05E, TE-ML 05F
- TE-ML 06K

Denison HF-0, HF-1, HF-2
Hesston-Fiat Multi-F, Multi-G
JCB
John Deere
- JDM J14B, J14C
- JDM J20A, J20B
- JDM J20C, J20D
- JDM J21A

Komatsu and Komatsu Dresser
- B-06-001, B-06-0002

Kubota UDT
Leyland
Link Belt
Sauer Sundstrand
Sperry-Vickers I-286-S, M-2950-S
Sundstrand Hydraulics (Plessey)
Vickers 35VQ25, M-2952-S
Volvo WB101

HydraTrans 135™ (cont'd)

TYPICAL PROPERTIES

HydraTrans 135™	Test Method	
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 9.5 61.8
Viscosity Index	ASTM D2270	135
Pour Point, °F (°C)	ASTM D97	-40 (-40)
Flash Point, °F (°C)	ASTM D92	425 (218)
API Gravity	ASTM D4052	28

D-A PART NUMBER

Bulk	57501
Tote – 330 Gal	57503
Drum – 55 Gal	57502
Pail (Metal) – 5 Gal	57509
Pail (Plastic) – 5 Gal	57508
Case – 4/1 Gal	57504

HydraTrans 100™

D-A **HydraTrans 100**™ is a transmission, hydraulic and wet brake system fluid providing excellent performance for severe service agricultural equipment applications. It is formulated from high-quality base stocks fortified with a high-performance additive system to extend component life and improve performance characteristics. D-A **HydraTrans 100**™ is designed as an agricultural product only, supporting the performance requirements of JDM J20C specification.

PRODUCT FEATURES AND BENEFITS

- Improves hydraulic pump and gear train life to help reduce maintenance costs.
- Improved oxidation stability extends oil life.
- Improved frictional properties prevent grabbing or chattering of wet brakes and PTO clutches.
- Excellent water tolerance and low temperature fluidity provides protection in all working environments.
- Affords brake chatter suppression and improves hydraulic performance.
- Provides rust and corrosion protection for all types of metal surfaces, increasing component life.
- Supports the performance requirements of JDM J20C specification. It is not suitable for heavy off-road equipment.

TYPICAL PROPERTIES

HydraTrans 100™	Test Method	
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 9.36 62.28
Viscosity Index	ASTM D2270	130
Pour Point, °F (°C)	ASTM D97	-47 (-44)
Flash Point, °F (°C)	ASTM D92	415 (213)
API Gravity	ASTM D4052	34.6

D-A PART NUMBER

Bulk	57511
Tote – 330 Gal	57513
Drum – 55 Gal	57512
Pail (Metal) – 5 Gal	57519
Pail (Plastic) – 5 Gal	57518
Case – 4/1 Gal	57514

ThermoPlex™

D-A **ThermoPlex**™ is a calcium sulfonate complex grease that offers superior high temperature lubrication coupled with outstanding mechanical stability for minimized grease run out. D-A **ThermoPlex**™ also provides extremely high load carrying capacity, optimized control of rust and corrosion, excellent water resistance and superior protection against heavy shock loads and severe equipment operation.

D-A **ThermoPlex**™ is proven in the toughest high temperature applications including brick kilns, steel mills, asphalt plant equipment and wheel bearings associated with disc brakes. D-A **ThermoPlex**™ is excellent for high temperature bearing applications as well as shaker screens, cone crushers, conveyors, loaders, trucks and many other applications.

D-A **ThermoPlex**™ provides truly versatile, multipurpose and superior performance in high temperature service as well as in general equipment lubrication.

PRODUCT FEATURES AND BENEFITS

- Dropping point of over 550°F for extreme high temperature applications.
- This is not a clay thickened grease so it will stay on-the-job without leaving abrasive residue.
- Excellent mechanical stability in heavy duty service resists grease breakdown and run-out in high and low temperature applications.
- Specially selected anti-wear compounds provide wear control and reduce friction.
- Rust and corrosion preventatives protect both ferrous and non-ferrous metals in damp or corrosive environments.
- Excellent EP (extreme pressure) protection properties increase component life.
- Combination of base oils, thickeners and additives provide a superb high temperature grease that also exhibits excellent low temperature pumpability.

TYPICAL APPLICATIONS

High Temperature Service
Asphalt Plants
Brick and Block Kilns
Cement Plants
Disc Brake Wheel Bearing Assemblies
Hammers and Pile Drivers
Paving Equipment
Steel Mill Applications

General Lubrication
Construction Equipment
Industrial Gear and Bearing Sets
Logging Machinery
Mining Equipment
Pit and Quarry Equipment
Truck Chassis
Heavy Water Environments
Highly Corrosive Environments
High Loads, Humidity, and Temperature Marine and Off-Shore Drilling Rigs
Wet and Dry Ends of Paper Machines
Marine Trailer Wheel Bearings

ThermoPlex™ (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method		
NLGI Grade	ASTM D217	#1	#2
Thickener Type	ASTM D128	Calcium Sulfonate Complex	Calcium Sulfonate Complex
Color	Visual	Green	Green
Usable Operating Temperature Range, °F (°C)		-4 to 302 (-20 to 150)	-4 to 302 (-20 to 150)
Worked Penetration @ 77°F	ASTM D217	310-340	265-295
Base Oil Viscosity @ 40°C	ASTM D445	220	220
Dropping Point, °F (°C)	ASTM D2265	550 (287)	550 (287)
Four Ball EP, Weld Load kgf	ASTM D2596	620	620
Four Ball Wear, Scar Dia., mm	ASTM D2266	<0.6	<0.6
Timken OK Load	ASTM D2509	>60	>60
Water Wash-Out, % Loss	ASTM D1264	N/A	0.75
Water Spray-Off, % Loss	ASTM D4049	N/A	60.5
Bearing Rust Test	ASTM D1743	Pass	Pass
Molybdenum Disulfide, wt. %	ASTM D128	Nil	Nil

D-A PART NUMBER

	#1	#2
Bulk	N/A	12871
Drum – 400 lb	12862	12872
Qtr Drum – 120 lb	12866	12876
Pail (Metal) – 35 lb	N/A	12879
Cartridges – 43 lb	12867T	12877T

ThermoPlex 3™

D-A **ThermoPlex 3**™ is a calcium sulfonate complex grease that offers superior high temperature lubrication coupled with outstanding mechanical stability for minimized grease run out. D-A **ThermoPlex 3**™ also provides extremely high load carrying capacity, optimized control of rust and corrosion, excellent water resistance and solid protection against heavy shock loads and severe equipment operation. D-A **ThermoPlex 3**™ contains 3% molybdenum disulfide (Moly).

D-A **ThermoPlex 3**™ is proven in the toughest high temperature applications including brick kilns and asphalt plant equipment. With bearing temperatures up to 475° F, D-A **ThermoPlex 3**™ performed while other complex and polyurea greases failed. Other field testing in shaker screens, cone crushers, conveyors, loaders, trucks, etc. illustrated that D-A **ThermoPlex 3**™ is truly a versatile multipurpose grease with superior performance in general equipment lubrication as well as in high temperature service.

PRODUCT FEATURES AND BENEFITS

- Dropping point of over 550°F for tough high temperature applications.
- This is not a clay thickened grease so it will stay on-the-job without leaving abrasive residue.
- Excellent mechanical stability in heavy duty service resists grease breakdown and run-out in high and low temperature applications.
- Molybdenum disulfide (Moly) provides wear control and reduces friction.
- Rust and corrosion preventatives protect both ferrous and non-ferrous metals in damp or corrosive environments.
- Excellent EP (extreme pressure) protection properties increase component life.
- Combination of high viscosity-high VI base oils/polymer mix resists thinning in high temperature service to maximize lubricant protection over a broad temperature range.

TYPICAL APPLICATIONS

High Temperature Service
Cement Plants
Brick and Block Kilns
Asphalt Plants
Paving Equipment
Hammers and Pile Drivers

General Lubrication
Construction Equipment
Logging Machinery
Mining Equipment
Truck Chassis
Industrial Gear sets
Pit and Quarry Equipment

ThermoPlex 3™ (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method		
NLGI Grade	ASTM D217	#1	#2
Thickener Type	ASTM D128	Calcium Sulfonate Complex	Calcium Sulfonate Complex
Color	Visual	Black	Black
Usable Operating Temperature Range, °F (°C)		-4 to 302 (-20 to 150)	-4 to 302 (-20 to 150)
Worked Penetration @ 77°F	ASTM D217	310-340	265-295
Base Oil Viscosity @ 40°C	ASTM D445	220	220
Dropping Point, °F (°C)	ASTM D2265	550 (287)	550 (287)
Four Ball EP, Weld Load kgf	ASTM D2596	620	620
Four Ball Wear, Scar Dia., mm	ASTM D2266	<0.6	<0.6
Timken OK Load, lbs	ASTM D2509	>60	>60
Water Wash-Out, % Loss	ASTM D1264	N/A	0.75
Water Spray-Off, % Loss	ASTM D4049	N/A	60.5
Bearing Rust Test	ASTM D1743	Pass	Pass
Molybdenum Disulfide, wt. %	ASTM D128	3	3

D-A PART NUMBER

	#1	#2
Drum – 400 lb	12312	12322
Qtr Drum – 120 lb	N/A	12326
Pail (Metal) – 35 lb	12319	12329
Cartridge – 43 lb	12317T	12327T

ThermoPlex 5™

D-A **ThermoPlex 5**™ is a calcium sulfonate complex grease designed specifically for use in high load and high speed applications with elevated ambient and operating temperatures. D-A **ThermoPlex 5**™ offers outstanding mechanical stability for minimized grease run out. D-A **ThermoPlex 5**™ also resists rust and oxidation, has excellent water/salt water resistance and solid protection against heavy shock loads and severe equipment operation. It will not corrode or damage steel, copper bearing alloys or conventional seal materials. D-A **ThermoPlex 5**™ contains 5% molybdenum disulfide (Moly).

D-A **ThermoPlex 5**™ offers a low environmental risk because it is formulated to use no lead, antimony, zinc, barium, chlorine, phosphorus or free sulfur. D-A **ThermoPlex 5**™ shows superior performance in general equipment lubrication as well as in high temperature service.

PRODUCT FEATURES AND BENEFITS

- Dropping point of 550°F for tough high temperature applications.
- Excellent mechanical stability in high load service resists grease breakdown and run-out in both high and low temperature applications.
- Molybdenum disulfide (Moly) provides wear control and reduces friction.
- Rust and corrosion preventatives protect both ferrous and non-ferrous metals in damp or corrosive environments.
- Excellent EP (extreme pressure) protection properties increase component life. Resists washout from fresh and salt water providing multi-environment applicability.
- Low environmental risk because it is formulated to use no lead, antimony, zinc, barium, chlorine, phosphorus or free sulfur.

TYPICAL APPLICATIONS

High Temperature Service
Cement Plants
Brick and Block Kilns
Asphalt Plants
Paving Equipment
Hammers and Pile Drivers

General Lubrication
Construction Equipment
Logging Machinery
Mining Equipment
Truck Chassis
Industrial Gear Sets
Pit and Quarry Equipment
Applications with Extreme High Pressure and/or Severe Shear or Frictional Wear.

ThermoPlex 5™ (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method			
NLGI Grade	ASTM D217	#0	#1	#2
Thickener Type	ASTM D128	Calcium Sulfonate Complex	Calcium Sulfonate Complex	Calcium Sulfonate Complex
Color	Visual	Black	Black	Black
Usable Operating Temperature Range, °F (°C)		-4 to 302 (-20 to 150)	-4 to 302 (-20 to 150)	-4 to 302 (-20 to 150)
Worked Penetration @ 77°F	ASTM D217	355-385	310-340	265-295
Base Oil Viscosity @ 40°C	ASTM D445	220	220	220
Dropping Point, °F (°C)	ASTM D2265	550 (287)	550 (287)	550 (287)
Four Ball EP, Weld Load kgf	ASTM D2596	500	620	620
Four Ball Wear, Scar Dia., mm	ASTM D2266	<0.6	<0.6	<0.6
Timken OK Load	ASTM D2509	>60	>60	>60
Water Wash-Out, % Loss	ASTM D1264	N/A	N/A	0.75
Water Spray-Off, % Loss	ASTM D4049	N/A	N/A	60.5
Bearing Rust Test	ASTM D1743	Pass	Pass	Pass
Molybdenum Disulfide, wt. %	ASTM D128	5	5	5

D-A PART NUMBER

	#0	#1	#2
Bulk	11741	11751	11761
Drum – 400 lb	N/A	11752	11762
Qtr Drum – 120 lb	N/A	11756	11766
Pail (Metal) – 35 lb	N/A	11759	11769
Cartridges – 43 lb	N/A	11757T	11767T

Titan Blue™

D-A **Titan Blue**™ is a technologically advanced grease specifically tailored for extreme lubrication conditions and challenging environments. When under extreme pressure and load, its unique **Micro Technology**™ system provides a controlled release of microencapsulated particles delivering a protective barrier preventing metal to metal (boundary) contact, particularly in various types of harsh ambient environments where high shock loads are expected. It also maintains unparalleled film thickness throughout its service and affords excellent high temperature stability / oxidation control at elevated temperatures. In addition, the D-A **Titan Blue**™ lithium sulfonate complex thickening system provides metal with inherent corrosion protection in the most challenging environmental conditions, including very corrosive salt-water ingression. D-A **Titan Blue**™ not only affords unparalleled protection and lubrication, but promotes extended grease service, reducing maintenance downtime and lubrication overall costs. It is blue in color and available in NLGI #0(Bulk), #1, and #2 grades.

PRODUCT FEATURES AND BENEFITS

- Unique **Micro Technology**™ system, imparting superior extreme pressure (EP) protection.
- Exceptional friction reducer and heat dissipater will easily handle heat in extreme environments.
- Superior oxidation protection for extended service life.
- Remarkable wear protection against the most extreme loads.
- Maintains pumpability and film strength at the same time.
- Lithium Sulfonate Complex thickener system that provides unsurpassed protection (less wear, lower friction) and equipment service life.
- All the pumpability and compatibility advantages of a Lithium and the extreme corrosion protection of a Sulfonate in one grease.
- Compatible with all Lithium thickeners.

TYPICAL APPLICATIONS

Mining
Quarry
Construction
Automotive
Marine
Trailer Wheel Bearings
Trucking
Refuse
Ready Mix Fleets
Industrial
Agriculture
Meets NLGI GC/LB Requirements

Titan Blue™ (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method			
NLGI Grade	ASTM D217	#0	#1	#2
Thickener Type	ASTM D128	Lithium Sulfonate Complex	Lithium Sulfonate Complex	Lithium Sulfonate Complex
Color	Visual	Blue	Blue	Blue
Usable Operating Temperature Range, °F (°C)		-22 to 400 (-30 to 205)	-22 to 400 (-30 to 205)	-22 to 400 (-30 to 205)
Worked Penetration @ 77°F	ASTM D217	355-385	310-340	265-295
Base Oil Viscosity @ 40°C	ASTM D445	220	220	220
Dropping Point, °F (°C)	ASTM D2265	N/A	500 (260)	500 (260)
Four Ball EP, Weld Load kgf	ASTM D2596	620	>800	>800
Four Ball Wear, Scar Dia., mm	ASTM D2266	0.60 max	0.60 max	0.60 max
Load Wear Index	ASTM D2596	120 min	150 min	150 min
Timken OK Load	ASTM D2509	60 lbs. min	>70 lbs. min	>70 lbs. min
Water Wash-Out, % Loss	ASTM D1264	N/A	10 max	5 max
Water Spray-Off, % Loss	ASTM D4049	N/A	45	25
Elastomers (2X)	ASTM D4289	GC-LB Limits	GC-LB Limits	GC-LB Limits
Copper Corrosion Test	ASTM D4048	1b	1b	1b
Bearing Rust Test	ASTM D1743	Pass	Pass	Pass
Rust Prevention, 100% Sea Water	ASTM D5969	Pass	Pass	Pass
U.S. Steel Mobility, gm/min @ 60°F	USS LT-37	400	250	150
Molybdenum Disulfide, wt. %	ASTM D128	Nil	Nil	Nil
Ring-on-Block (Low speed/High Load) 1-hour test, non-replenished sump	ASTM D2509 Modified			
PSI Rating, psi.		Pass/>8000 psi	Pass/>9000 psi	Pass/>9000 psi
Max Temperature, °F (°C)		284 (140)	284 (140)	284 (140)
Average Coefficient of Friction After 30-minute break in		<0.03	<0.03	<0.03

D-A PART NUMBER

	#0	#1	#2
Bulk	12291	12241	12261
Drum – 400 lb	N/A	12242	12262
Qtr Drum – 120 lb	12296	12246	12266
Pail (Metal) – 35 lb	N/A	12249	12269
Cartridges – 43 lb	N/A	12247T	12267T

MagnaPlex™

D-A **MagnaPlex**™ is a multi-purpose lithium complex grease. Its unique additive system resists water wash-out making it an excellent choice for use in wet or humid environments. It resists softening in high temperature and extreme pressure applications as well. D-A **MagnaPlex**™ creates a slippery film barrier that remains in place due to a metal affinity and reduced polymer shear.

The D-A **MagnaPlex**™ additive system is non-corrosive to all types of bearing and gear metallurgy, even those containing bronze, brass and copper.

PRODUCT FEATURES AND BENEFITS

- Special blend of additives limits wear and reduces friction in normal and severe machine service.
- Affinity for metal surfaces increases with pressure producing a slippery physical barrier of protection.
- Formulated to support the performance requirements of most OEM guidelines for severe service in pin and bushing sets, bearings, general chassis lubrication and more.
- Rust and corrosion preventatives protect both ferrous and non- ferrous metals in damp or corrosive environments.
- Excellent shear stability and bleed resistance protect against grease leakage and helps control lubrication costs.
- Pumps easily from tubes and other types of containers, perfect for use in central lubrication systems or in all weather conditions.
- Excellent shear stability and temperature stability provide dependable performance under changing working conditions.
- Meets the performance requirements of NLGI GC/LB rating.

TYPICAL APPLICATIONS

General Off-Highway Lubrication
Wet or Humid Environment Applications
Bearings
Chassis Lubrication
Pins and Bushings
European Manufactured Cranes and Concrete Pumpers
Heavy Duty Fleets
Agricultural Equipment
Mining Applications
Industrial Applications
Trucks
Fittings
Scraper Goose Necks
Track Rollers
Drive Rollers
Meets NLGI GC/LB Requirements
SAE J301 applications
Automotive Applications
Refuse Applications

MagnaPlex™ (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method		
NLGI Grade	ASTM D217	#1	#2
Thickener Type	ASTM D128	Lithium Complex	Lithium Complex
Color	Visual	Blueish Green	Blueish Green
Usable Operating Temperature Range, °F (°C)		-22 to 400 (-30 to 205)	-22 to 400 (-30 to 205)
Worked Penetration @ 77°F	ASTM D217	310-340	265-295
Base Oil Viscosity @ 40°C	ASTM D445	220	220
Dropping Point, °F (°C)	ASTM D2265	500 (260) min	500 (260) min
Four Ball EP, Weld Load kgf	ASTM D2596	500	500
Four Ball Wear, Scar Dia., mm	ASTM D2266	0.60 max	0.60 max
Load Wear Index	ASTM D2596	75 min	75 min
Timken OK Load	ASTM D2509	60	60
Water Wash-Out, % Loss	ASTM D1264	10 max	5 max
Water Spray-Off, % Loss	ASTM D4049	45	25
Elastomers (2X)	ASTM D4289	GC-LB Limits	GC-LB Limits
Copper Corrosion Test	ASTM D4048	1b	1b
Bearing Rust Test	ASTM D1743	Pass	Pass
U.S. Steel Mobility, gm/min @ 60°F	USS LT-37	275	175
Molybdenum Disulfide, wt. %	ASTM D128	Nil	Nil

D-A PART NUMBER

	#1	#2
Bulk	12711	12721
Drum – 400 lb	12712	12722
Qtr Drum – 120 lb	12716	12726
Pail (Metal) – 35 lb	12719	12729
Cartridges – 43 lb	12717T	12727T

MagnaPlex 3™

D-A **MagnaPlex 3**™ is specially formulated for heavy-duty service where high shock loads are common. D-A **MagnaPlex 3**™ provides excellent cohesive as well as adhesive characteristics needed for continuous lubricant protection. It also provides protection against rust and corrosion while controlling oxidation at elevated temperatures. D-A **MagnaPlex 3**™ provides excellent lubrication protection and extends grease service intervals, thus reducing downtime and lowering overall lubrication costs.

PRODUCT FEATURES AND BENEFITS

- Unsurpassed shock load protection extends pin and bushing service life in severe off-road service.
- Superior mechanical shear stability reduces in-service softening for better grease retention in the toughest applications.
- Extremely cohesive and adhesive properties assure proper lubrication over extended service intervals.
- Fortified with molybdenum disulfide to provide extra wear protection while reducing friction.
- Rust and corrosion inhibitors control metal attack even in damp or corrosive environments.
- Seals out dirt and water for maximum wear protection and component life.
- Compositionally balanced for optimum pumpability when used in automatic lube systems.
- Meets the performance requirements of NLGI GC/LB rating.

TYPICAL APPLICATIONS

Pin and Bushing Assemblies
Pivot Pins
Hydraulic Linkage Pins
Bucket Pins
Truck Kingpins
5th Wheel Applications
Mining Applications
Industrial Applications
Scraper Goose Necks
Fittings
Crusher Bearings
Trunnion Bearings
Shaker Screen Bearings
Automatic Lube Systems
Construction Equipment
Agricultural Equipment
Slow Speed Ball and Roller Bearings
Manual Cone Adjustments
Track Rollers
Drive Rollers
Troughing Rollers and Idlers
General Chassis
Refuse Applications
Meets NLGI GC/LB Requirements

MagnaPlex 3™ (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method		
NLGI Grade	ASTM D217	#1	#2
Thickener Type	ASTM D128	Lithium Complex	Lithium Complex
Color	Visual	Dark Gray	Dark Gray
Usable Operating Temperature Range, °F (°C)		-22 to 400 (-30 to 205)	-22 to 400 (-30 to 205)
Worked Penetration @ 77°F	ASTM D217	310-340	265-295
Base Oil Viscosity @ 40°C	ASTM D445	220	220
Dropping Point, °F (°C)	ASTM D2265	500 (260) min	500 (260) min
Four Ball EP, Weld Load kgf	ASTM D2596	620	620
Four Ball Wear, Scar Dia., mm	ASTM D2266	0.60 max	0.60 max
Load Wear Index	ASTM D2596	110 min	110 min
Timken OK Load	ASTM D2509	60	60
Water Wash-Out, % Loss	ASTM D1264	10 max	5 max
Water Spray-Off, % Loss	ASTM D4049	45	25
Copper Corrosion Test	ASTM D4048	1b	1b
Bearing Rust Test	ASTM D1743	Pass	Pass
U.S. Steel Mobility, gm/min @ 60°F	USS LT-37	275	175
Molybdenum Disulfide, wt. %	ASTM D128	3	3
Ring-on-Block (Low speed/High Load) 1-hour test, non-replenished sump	ASTM D2509 Modified	Pass	Pass

D-A PART NUMBER

	#1	#2
Bulk	12361	12371
Drum – 400 lb	12362	12372
Qtr Drum – 120 lb	12366	12376
Pail (Metal) – 35 lb	12369	12379
Cartridges – 43 lb	12367T	12377T

MagnaPlex 5™

D-A **MagnaPlex 5**™ is specially formulated for heavy-duty service where high shock loads are common. D-A **MagnaPlex 5**™ provides excellent cohesive as well as adhesive characteristics needed for continuous lubricant protection. It also provides protection against rust and corrosion while controlling oxidation at elevated temperatures. D-A **MagnaPlex 5**™ provides excellent lubrication protection and extends grease service intervals, thus reducing downtime and lowering overall lubrication costs.

D-A **MagnaPlex 5**™ grease is designed for applications where a 5% moly (molybdenum disulfide) grease is recommended.

PRODUCT FEATURES AND BENEFITS

- Superior shock load protection extends pin and bushing service life in severe service operations.
- Superior mechanical shear stability reduces in-service softening for better grease retention in the toughest applications.
- Extremely cohesive and adhesive properties assure proper lubrication over extended service intervals.
- Fortified with molybdenum disulfide to provide extra wear protection while reducing friction.
- Rust and corrosion inhibitors control acid attack even in damp or corrosive environments.
- Seals out dirt and water for maximum wear protection and component life.
- Compositionally balanced for optimum pumpability when used in automatic lube systems.

TYPICAL APPLICATIONS

Supports the Performance Requirements of:

Caterpillar
Komatsu
Large Wheel Loaders
Excavators
Mining Applications
Construction Equipment
Agricultural Equipment

For use when manufacturer specifications call for 5% moly grease.

MagnaPlex 5™ (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method		
NLGI Grade	ASTM D217	**#1**	**#2**
Thickener Type	ASTM D128	Lithium Complex	Lithium Complex
Color	Visual	Dark Gray	Dark Gray
Usable Operating Temperature Range, °F (°C)		-22 to 400 (-30 to 205)	-22 to 400 (-30 to 205)
Worked Penetration @ 77°F	ASTM D217	310-340	265-295
Base Oil Viscosity @ 40°C	ASTM D445	220	220
Dropping Point, °F (°C)	ASTM D2265	500 (260) min	500 (260) min
Four Ball EP, Weld Load kgf	ASTM D2596	620	620
Four Ball Wear, Scar Dia., mm	ASTM D2266	0.60 max	0.60 max
Load Wear Index	ASTM D2596	110 min	110 min
Timken OK Load	ASTM D2509	60	60
Water Wash-Out, % Loss	ASTM D1264	10 max	5 max
Water Spray-Off, % Loss	ASTM D4049	45	25
Copper Corrosion Test	ASTM D4048	1b	1b
Bearing Rust Test	ASTM D1743	Pass	Pass
U.S. Steel Mobility, gm/min @ 60°F	USS LT-37	275	175
Molybdenum Disulfide, wt. %	ASTM D128	5	5
Ring-on-Block (Low speed/High Load) 1-hour test, non-replenished sump	ASTM D2509 Modified	Pass	Pass

D-A PART NUMBER

	#1	#2
Bulk	N/A	12611
Drum – 400 lb	12602	12612
Qtr Drum – 120 lb	N/A	12616
Pail (Metal) – 35 lb	N/A	12619
Cartridges – 43 lb	N/A	12617T

Prolith™

D-A **Prolith**™ is a general purpose lithium grease formulated for excellent mobility and pumping ease in centralized lubrication systems. **Prolith**™ No. 2 grade offers better low temperature grease delivery to critical lubrication points than most No. 1 grades. The red color makes this grease easy to identify during application and operation. The combination of EP (extreme pressure) additives and a stable soap structure results in a high-quality grease capable of protecting heavily loaded machinery, while remaining in place.

PRODUCT FEATURES AND BENEFITS

- Special blend of extreme pressure additives limits wear and reduces friction in normal and severe machine service.
- Rust and corrosion preventatives protect both ferrous and non- ferrous metals in damp or corrosive environments.
- Red color makes Prolith™ easy to identify during application and operation.
- Good shear stability and bleed resistance protect against grease leakage and help control lubrication costs.
- Pumps easily from tubes and other types of containers, perfect for use in central lubrication systems or in all weather conditions.
- Meets the performance requirements of NLGI LB rating.

TYPICAL APPLICATIONS

General Lubrication
Bearings
Track Rollers
Drive Rollers
Fittings
Trucking Applications
Industrial Applications
Pivot Pins
5th Wheel Applications
Semi-Trailer Landing Gears
Semi-Trailer Wheel Axle Bearings
Agricultural Equipment
Automotive Applications
Meets NLGI LB Requirements

Prolith™ (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method					
NLGI Grade	ASTM D217	#000	#00	#0	#1	#2
Thickener Type	ASTM D128	Lithium 12 - Hydroxystearate				
Color	Visual	Red				
Usable Operating Temperature Range, °F (°C)		-22 to 300 (-30 to 140)				
Worked Penetration @ 77°F	ASTM D217	445-475	400-430	355-385	310-340	265-295
Base Oil Viscosity @ 40°C	ASTM D445	220	220	220	220	220
Dropping Point, °F (°C)	ASTM D2265	N/A	N/A	320 (160)	360 (182)	380 (193)
Four Ball EP, Weld Load kgf	ASTM D2596	315	315	315	315	315
Four Ball Wear, Scar Dia., mm	ASTM D2266	0.60	0.60	0.60	0.60	0.60
Load Wear Index	ASTM D2596	50	50	50	50	50
Timken OK Load	ASTM D2509	40	40	50	50	50
Water Wash-Out, % Loss	ASTM D1264	N/A	N/A	N/A	15 max	10 max
Water Spray-Off, % Loss	ASTM D4049	N/A	N/A	N/A	45	25
Copper Corrosion Test	ASTM D4048	1b	1b	1b	1b	1b
Bearing Rust Test	ASTM D1743	Pass	Pass	Pass	Pass	Pass
U.S. Steel Mobility, gm/min @ 60°F	USS LT-37	N/A	N/A	800	500	325
Molybdenum Disulfide, wt. %	ASTM D128	Nil	Nil	Nil	Nil	Nil

D-A PART NUMBER

	#000	#00	#0	#1	#2
Bulk	N/A	N/A	N/A	12501	12511
Drum – 400 lb	11032-380	12532-380	N/A	12502	12512
Qtr Drum – 110 lb	11036-110	12536-110	12526-110	12506-110	N/A
Qtr Drum – 120 lb	N/A	N/A	N/A	12506	12516
Pail (Metal) – 35 lb	N/A	12539	12529	12509	12519
Pail (Metal) – 30 lb	11038-30	N/A	N/A	N/A	N/A
Cartridges – 43 lb	N/A	N/A	N/A	12507T	12517T

Open Gear All Seasons™

D-A **Open Gear All Seasons**™ is a heavy bodied grease offering extra adhesiveness for severe duty applications such as open gears, swing gears, 5th wheels, processing mills and sand and gravel plants. D-A **Open Gear All Seasons**™ is an excellent lubricant for the sliding surfaces on crane booms and outriggers. It resists water, protects against rust and corrosion and limits wear through use of the solid lubricant molybdenum disulfide (moly). D-A **Open Gear All Seasons**™ is available in caulk type tubes for easy application.

PRODUCT FEATURES AND BENEFITS

- Contains molybdenum disulfide (moly) which provides optimum wear protection under heavy loads.
- Water resistance protects equipment in applications where water is a problem.
- Completely compatible with most types of metal surfaces commonly found in heavy duty equipment.
- Additives protect against rust and corrosion in even the most severe environments ensuring continuous lubricant protection.
- Excellent metal adhesion maintains lubrication over extended periods.

TYPICAL APPLICATIONS

Open Gear Sets
Fifth Wheels
Mills Asphalt Plants
Lift Truck Masts Cement Plants
Telescoping Booms and Outriggers
Shaker Screens
Conveyors
Asphalt Plants
Cement Plants
Sand and Gravel Plants

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	
NLGI Grade	ASTM D217	#1
Thickener Type	ASTM D128	Lithium 12-Hydroxystearate
Color	Visual	Black
Worked Penetration @ 77°F	ASTM D217	325
Base Oil Viscosity @ 40°C	ASTM D445	5762
Viscosity Index	ASTMD2270	122
Flash Point, °F	ASTM D92	>400
Four Ball EP, Weld Load kgf	ASTM D2596	800+
Four Ball EP, LWI	ASTM D2596	155
Four Ball Wear, scar dia. mm	ASTM D2266	0.65
Water Wash-Out, % Loss	ASTM D1264	<2
Water Spray-Off, % Loss	ASTM D4049	<6
Copper Corrosion Test	ASTM D4048	1b
Bearing Rust Test	ASTM D1743	Pass
Mobility @ 60°F (g/min)		100.8
Molybdenum Disulfide, wt. %	ASTM D128	2.0

D-A PART NUMBER

Pail (Metal) – 25 lb 12048

Corn Head Grease

D-A **Corn Head Grease** is a premium quality multipurpose semi-fluid lubricant formulated for use in equipment where leakage and moisture are concerns. It's highly refined base oils and specialized ultra-high quality thixotropic polymer helps maintain a working seal in various industrial gear box and bearing applications. It is particularly suited as an 'all-season' lubricant for agricultural corn head gear cases and leaking cutter head gear cases on continuous miners.

PRODUCT FEATURES AND BENEFITS
D-A **Corn Head Grease** additive technology with built-in EP (Extreme Pressure) and highly effective oxidation/anti-wear inhibitors that significantly reduce wear by protecting components against carbon and varnish. **Corn Head Grease** additive technology also delivers an aggressive defense against wash-out and substantially reduces wear during dry start-up conditions and 'severe' environment operation. It also imparts excellent characteristics for enhanced high/low temperature performance.

Additionally, it offers the following benefits:
- Exceptional oxidation, corrosion protection.
- Superior high and low temperature properties.
- Compatible with most grease thickeners (including Lithium).
- NLGI #0 Grade provides leakage resistance.
- Vigorous EP/Anti-wear component protection.
- Robust anti-leak thixotropic action.
- Withstands water washout.

TYPICAL APPLICATIONS
D-A **Corn Head Grease** is the appropriate choice for corn head case/slow moving gear box and bearing lubrication. Always consult with OEM (Original Equipment Manufacturer) for appropriate lubricant viscosity and quality selection.

TYPICAL PROPERTIES

NLGI Grade	ASTM D217	#0
Thickener Type		Polyurea
Color	Visual	Green
Worked Penetration @ 77°F	ASTM D217	355-385
Base Oil Viscosity @ 40°F	ASTM D445	170
Dropping Point, °F (°C)	ASTM D2265	446 (230)
Four Ball EP, Weld Load kgf	ASTM D2596	400
Four Ball Wear, Scar Diam., mm	ASTM D2266	0.50
Four Ball Load Wear Index (LWI)	ASTM D2596	46.5
Copper Corrosion Test	ASTM D4048	1b
Bearing Rust Test	ASTM D1743	Pass

D-A PART NUMBER

	#0
Tubes - 40 Tube Case	13117T-40

GearTec MGO FS™

D-A **GearTec MGO FS**™ is a full synthetic, premium, industrial, extreme pressure gear lubricant, formulated with a combination of Polyalphaolefin (PAO) and Polyolester (POE). D-A **GearTec MGO FS**™ provides good oxidation resistance, easier cold temperature starting, excellent managed heat distribution and lower internal operating temperatures. Designed with specialized additives, D-A **GearTec MGO FS**™ provides protection to industrial gear systems by offering a balance of extreme pressure and anti-wear additives. Oxidation, corrosion, rust and foam inhibitors are also blended into the final product. The high film strength and load carrying capacity provide gear teeth protection from wear, all types of surface stress and premature failure. When monitored, D-A **GearTec MGO FS**™ can offer extended drain intervals.

D-A **GearTec MGO FS**™ is well suited for use in enclosed gear systems operating under heavy shock loading. It also supports the performance requirements for the lubrication of crawler drives and cutter head gears of continuous mining machines; in plain and anti-friction bearing, chassis drives/slides, spur, herringbone, bevel and worm gears in mill, mining and mobile equipment calling for AGMA EP type lubricants.

PRODUCT FEATURES AND BENEFITS

- Designed with a combination of PAO and POE base stock.
- Additive package tailored specifically to manage the harsh conditions found in the mining industry.

TYPICAL APPLICATIONS

Supports the performance requirements of:
Crawler drives and cutter head gears of continuous mining machines;
Plain and anti-friction bearing,
Chassis drives/slides,
Spur, herringbone, bevel and worm gears in mill, mining and mobile equipment calling for AGMA EP type lubricants.
US Steel 224: all grades

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	220	320
AGMA Viscosity Grade		5EP	6EP
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 31 212	 41 310
Viscosity Index	ASTM D2270	180	184
Pour Point, °F (°C)	ASTM D97	-44 (-42)	-35 (-37)
Flash Point, °F (°C)	ASTM D92	482 (250)	482 (250)
API Gravity	ASTM D4052	34.5	33.8
FZG Test, Pass Stage	ASTM D5182	12+	12+
Copper Strip Corrosion	ASTM D130	1b	1b
Rust Test	ASTM D665	Pass	Pass

D-A PART NUMBER

	220	320
Bulk	13561	13571
Pail (Metal) – 35 lb	13569LB	13579LB

GearSyn EP™

D-A **GearSyn EP**™ synthetic gear oil is engineered for all kinds of industrial enclosed gearing, and plain or rolling element bearings requiring an EP gear oil. **GearSyn EP**™ exhibits superb oxidation and thermal stability along with excellent low temperature performance across a wide range of applications. Under these various temperatures, protection is not jeopardized by varying load and speed conditions. **GearSyn EP**™ oil is formulated with outstanding extreme pressure (EP) additives to provide a layer of protection for shock loading. It is especially useful where micro-pitting of gear teeth has been a problem. Its low friction tendencies, when compared to conventional gear lubricants, produce lower operating temperatures and increased gear efficiency providing an opportunity to reduce operating costs. **GearSyn EP**™ incorporates an effective demulsifier to rapidly separate water from the oil so that the water can be drained off. This limits the risk of foaming and maintains oil film integrity, as well as reducing the chance of corrosion and premature oxidation.

PRODUCT FEATURES AND BENEFITS

- This synthetic formulation provides outstanding resistance to high temperature thermal stress and oxidation.
- Longer oil life results while providing exceptional lubrication protection.
- Excellent fluidity at low temperatures and low co-efficient of friction at all temperatures permits easier start-ups and energy efficient operation.
- A unique combination of synthetic base oils and anti-wear additives provide low gear and bearing wear, including excellent resistance to micro-pitting of gear teeth.
- Special additives minimie corrosion of bronze and copper metals and at the same time protect iron and steel components from oxidation.
- Rapid water separation minimizes potential damage caused by exposure of lubricated surfaces to free water.
- Longer oil life, longer gear and bearing life and excellent lubricity and flow properties provide reduced maintenance costs and greater operating efficiency.
- Maximum base oil stability even under conditions of high temperature and oxidation minimizes build-up of deposits.

TYPICAL APPLICATIONS

Vibratory roller exciter gear boxes
Severely loaded industrial gears
Stationary and mobile equipment, antifriction and journal bearings
Enclosed gearboxes requiring EP lubricants
Steel-on-steel fittings
Circulating oil systems

AGMA 9005-E02 (EP)
AIST (US Steel) 224
Boston Gear
DIN 51517, Part 3

GearSyn EP™ (cont'd)

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	68	100	150	220	320	460
AGMA Viscosity Grade		2EP	3EP	4EP	5EP	6EP	7EP
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 10.9 72	 14.2 100	 19.8 156	 25.4 217	 33.6 315	 44.2 456
Viscosity Index	ASTM D2270	141	144	146	148	149	151
Pour Point, °F (°C)	ASTM D97	-35 (-37)	-36 (-38)	-38 (-39)	-35 (-37)	-29 (-34)	-20 (-29)
Flash Point, °F (°C)	ASTM D92	450 (232)	432 (222)	432 (222)	432 (222)	441 (227)	439 (226)
API Gravity	ASTM D4052	31.92	31.12	30.06	29.30	28.43	27.60
FZG Test, Pass Stage	ASTM D5182	12+	12+	12+	12+	12+	12+
Copper Strip Corrosion	ASTM D130	1b	1b	1b	1b	1b	1b
Rust Test	ASTM D665	Pass	Pass	Pass	Pass	Pass	Pass
Foam Test	ASTM D892	Pass	Pass	Pass	Pass	Pass	Pass

D-A PART NUMBER

	68	100	150	220	320	460
Tote – 330 Gal	N/A	N/A	14463	14473	14483	N/A
Drum – 400 lb	N/A	N/A	14462LB	14472LB	14482LB	14492LB
Pail (Metal) – 35 lb	N/A	N/A	14469LB	14479LB	14489LB	14499LB
Pail (Plastic) – 35 lb	14648LB	N/A	14468LB	14478LB	14488LB	14498LB

Crusher Lubricant™

D-A **Crusher Lubricant**™ provides excellent performance in gyratory, cone and jaw crushers. It is also well suited for use in screen gearboxes and bearings requiring EP gear oil lubrication. D-A **Crusher Lubricant**™ is specially formulated to be compatible with bronze and brass bushings and bearings. It helps limit rust and corrosion plus contains extreme pressure additives for severe service use. D-A **Crusher Lubricant**™ comes in seven grades to allow selection of the best lubricant for each application during all types of service.

PRODUCT FEATURES AND BENEFITS

- Specially formulated for extra wear control and longer rock crushing and construction materials handling equipment life.
- Carefully balanced extreme pressure additives offer a unique level of steel gear protection while also minimizing wear of soft, sensitive yellow metal bushings and worm gears.
- Rust and corrosion inhibitors limit rusting and copper corrosion in both normal and idle time service.
- Excellent demulsibility promotes quick water separation and assures better equipment lubrication.
- Highly resistant to oxidation and thermal stress for extended lubricant life with fewer deposit and corrosion problems caused by lubricant deterioration.
- Non-foaming formulation minimizes air entrainment that can lead to excessive bearing, bushing and gear wear.

TYPICAL APPLICATIONS

Allis Chalmers gyratory and cone crushers as a circulating lubricant.
Applications calling for:
AIST (US Steel) 224
AGMA 9005 E-02
DIN51517 Part 3
GM LS-2 EP Gear Oil
Compatible with bronze and brass bushings and bearings.
Gearcases and speed reducers requiring EP gear lubricant.
Hand oiled or drip-fed bearings.
Jaw crushers and vibrating screen gearboxes and bearings requiring gear oil lubrication.
Oil lubricated antifriction bearings subject to shock loads.
Other gyratory and cone crushers as a circulating lubricant.
Symons gyratory and cone crushers as a circulating lubricant.
Telsmith gyratory and cone crushers as a circulating lubricant.
Worm gear sets needing soft-slippery EP lubrication.

Crusher Lubricant™ (cont'd)

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	68	100	150	220	320	460
AGMA Viscosity Grade		2EP	3EP	4EP	5EP	6EP	7EP
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 8.7 69	 11.7 105	 14.8 154	 18.8 222	 24.1 323	 30.2 455
Viscosity Index	ASTM D2270	95	95	95	95	95	95
Pour Point, °F (°C)	ASTM D97	-17 (-327)	-0 (-318)	-18 (-28)	1 (-17)	1 (-17)	5 (-15)
Flash Point, °F (°C)	ASTM D92	415 (213)	445 (229)	455 (235)	460 (238)	465 (241)	465 (241)
FZG Test, Pass Stage	ASTM D5182	13	13	13	13	13	13
Copper Strip Corrosion	ASTM D130	1b	1b	1b	1b	1b	1b
Rust Test	ASTM D665	Pass	Pass	Pass	Pass	Pass	Pass
Timken OK Load, lbs.	ASTM D2509	65	65	65	65	65	65

D-A PART NUMBER

	68	100	150	220	320	460
Bulk	13011	13021	13001	13041	13031	13051
Totes – 330 Gal	N/A	N/A	13003	N/A	N/A	N/A
Drum – 400 lb	13012LB	13022LB	13002LB	13042LB	13032LB	N/A
Pail (Metal) - 35 lb	N/A	N/A	N/A	13049LB	N/A	N/A
Pail (Plastic) – 35 lb	13018LB	13028LB	13008LB	13048LB	13038LB	13058LB

GearTec MGO™

D-A **GearTec MGO**™ is a premium emulsifiable, industrial, extreme pressure gear oil. Designed with specialized additives, **GearTec MGO**™ provides protection to industrial gear systems operating in extremely wet environments. The specialized emulsifiers are very shear stable and form stable emulsions. Along with the emusifier package, it contains a balance of extreme pressure and anti-wear additives. Oxidation, corrosion, rust and foam inhibitors are also blended into the final product. The high film strength and load carrying capacity provide gear teeth protection from wear, all types of surface stress and premature failure.

D-A **GearTec MGO**™ is well suited for use in enclosed gear systems operating under heavy shock loading. It also supports the performance requirements for the lubrication of crawler drives and cutter head gears of continuous mining machines; in plain and anti-friction bearing, chassis drives/slides, spur, herringbone, bevel and worm gears in mill, mining and mobile equipment calling for AGMA EP type lubricants.

PRODUCT FEATURES AND BENEFITS
- Additive package tailored specifically to manage the harsh conditions found in the mining industry.
- Contains a water emulsifier to promote continuous lubrication even with a wet environment.
- High VI, quality paraffinic base stocks extend the life of the oil.

TYPICAL APPLICATIONS
Supports the performance requirements of:
Crawler drives and cutter head gears of continuous mining machines;
Plain and anti-friction bearing,
Chassis drives/slides,
Spur, herringbone, bevel and worm gears in mill, mining and mobile equipment calling for AGMA EP type lubricants.
AGMA 9005-D94
Cincinnati Milacron
US Steel 224: all grades

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	320	460
AGMA Viscosity Grade		6EP	7EP
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 24.9 317	 31.9 460
Viscosity Index	ASTM D2270	100	100
Pour Point, °F (°C)	ASTM D97	-4 (-20)	14 (-10)
Flash Point, °F (°C)	ASTM D92	500 (260)	525 (274)
API Gravity	ASTM D4052	26.0	25.3
FZG Test, Pass Stage	ASTM D5182	12+	12+
Copper Strip Corrosion	ASTM D130	1b	1b
Rust Test	ASTM D665	Pass	Pass
Foam Test	ASTM D892	Pass	Pass

GearTec MGO™ (cont'd)

D-A PART NUMBER

	320	460
Bulk	13161	13181
Drum – 400 lb	13162LB	N/A
Pail (Metal) - 35 lb	13169LB	13189LB

GTD™

D-A **GTD**™ gear lubricant is a mild EP gear lubricant designed to meet the lubrication needs of gear trains requiring the use of an extreme pressure lubricant. It is especially well-suited for use in severe service equipment such as rock crushers. D-A **GTD**™ is formulated with quality base oils and carefully selected additives resulting in a product which will provide excellent anti-wear protection under heavy loads while also guarding against rust and corrosion, even when the system is idle. Special inhibitors are also present which limit oil oxidation and deposit formation even at high operating temperatures.

D-A **GTD**™ is available in eight ISO grades to provide optimum protection under any operating condition.

PRODUCT FEATURES AND BENEFITS

- Unique balance of extreme pressure additives extends equipment life through minimized gear wear.
- Limits wear during equipment start-up and acceleration, as well as during extreme loading conditions, by minimizing metal-to-metal contact, providing excellent heavy load protection during low speed/high-torque service.
- Specially formulated to control rust and corrosion of all types of metal surfaces.
- Compatible with yellow metals such as brass, bronze and copper to resist excess wear.
- Quality base oils and antioxidant additive produce a lubricant with excellent resistance to high temperature degradation for longer lubricant life.

TYPICAL APPLICATIONS

Gearcases and speed reducers requiring EP gear lubricant
Hand oiled or drip-fed bearings
Jaw crushers and vibrating screen gearboxes and bearings requiring EP gear oil lubrication
Oil lubricated antifriction bearings subject to shock loads
AGMA 250.04 and AGMA 9005 D94, EP - All Grades
AIST (US Steel) 222 and 224 - All Grades API GL-3
Bijur Equipment - All Grades
Cincinnati Lamb P-63 (ISO 68); P-76 (ISO 100); P-77 (ISO 150); P-74 (ISO 220); P-59 (ISO 320); P-35 (ISO 460)
DIN 51354, Part 2 (FZG Test) and DIN 51517, Part 3 (CLP) - All Grades
Omnicone and HP Crushers (ISO 150)
Symons, Telsmith, Allis Chalmers and other gyratory and cone crushers as a circulating lubricant
Symons and Nordberg Gyradisc Crushers (ISO 68)

GTD™ (cont'd)

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	68	100	150	220
AGMA Viscosity Grade		2EP	3EP	4EP	5EP
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 8.7 69	 11.7 105	 14.8 154	 18.8 222
Viscosity Index	ASTM D2270	95	95	95	95
Pour Point, °F (°C)	ASTM D97	-17 (-27)	0 (-18)	-13 (-25)	1 (-17)
Flash Point, °F (°C)	ASTM D92	415 (213)	445 (229)	455 (235)	460 (238)
API Gravity	ASTM D4052	31.9	29.0	29.6	28.9
FZG Test, Pass Stage	ASTM D5182	12	12	12	12
Copper Strip Corrosion	ASTM D130	1b	1b	1b	1b
Rust Test	ASTM D665	Pass	Pass	Pass	Pass
Timken OK Load, lbs	ASTM D2509	65	65	65	65

ISO Viscosity Grade	Test Method	320	460	680	1000
AGMA Viscosity Grade		6EP	7EP	8EP	8A EP
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 24.1 323	 30.6 466	 37.5 680	 45.6 1000
Viscosity Index	ASTM D2270	95	95	95	95
Pour Point, °F (°C)	ASTM D97	1 (-17)	5 (-15)	14 (-10)	23 (-5)
Flash Point, °F (°C)	ASTM D92	465 (241)	470 (243)	473 (245)	473 (245)
API Gravity	ASTM D4052	26.1	22.6	23.4	22.7
FZG Test, Pass Stage	ASTM D5182	12	12	12	12
Copper Strip Corrosion	ASTM D130	1b	1b	1b	1b
Rust Test	ASTM D665	Pass	Pass	Pass	Pass
Timken OK Load, lbs	ASTM D2509	65	65	65	65

D-A PART NUMBER

	68	100	150	220
Bulk	13301	13311	13321	13331
Tote – 330 Gal	13303	N/A	13323	13333
Drum – 400 lb	13302LB	13312LB	13322LB	13332LB
Pail (Metal) – 35 lb	13309LB	13319LB	13329LB	13339LB
Pail (Plastic) – 35 lb	N/A	N/A	13328LB	N/A

GTD™ (cont'd)

D-A PART NUMBER (cont'd)

	320	460	680	1000
Bulk	13341	13351	N/A	N/A
Tote – 330 Gal	13343	N/A	13363	N/A
Drum – 400 lb	13342LB	13352LB	13362LB	13372LB
Pail (Metal) – 35 lb	13349LB	13359LB	13369LB	N/A
Pail (Plastic) – 35 lb	N/A	N/A	N/A	N/A

SynSure™

D-A **SynSure**™ synthetic lubricants are transportation industry-oriented gear oils which focus on the critical needs of heavy-duty truck axles and differentials. D-A **SynSure**™ provides superior lubricant protection in the most severe service, including sub-arctic to desert conditions. **SynSure**™ is ideal for use in truck differentials and axles operating with equipment manufacturer extended warranties in extended drain service. D-A **SynSure**™ out-performs conventional gear lubricants to promote longer gear life and better equipment operating economy.

PRODUCT FEATURES AND BENEFITS

D-A **SynSure**™ **SAE 75W-90** and **SAE 80W-140**

- Extreme Pressure API GL-5 synthetic gear lubricants provide excellent lubricant flow at all operating temperatures, including sub-zero service. (SAE 75W-90)
- Contains extreme pressure additives as well as rust and oxidation inhibitors to provide superior gear and bearing protection under a wide range of operating conditions.
- Extremely high film strength and outstanding low temperature performance ensure extra gear life in the toughest service.
- Resists oxidation even during the hottest climatic conditions to last significantly longer than conventional gear oils.
- Exceptional shear stability retains viscosity and film strength under severe operating conditions to prevent wear.
- Enhanced friction reduction properties improve fuel economy and reduce operating costs.

TYPICAL APPLICATIONS

D-A **SynSure**™ **SAE 75W-90** and **SAE 80W-140**

Heavy duty axles and final drives requiring API GL-5 & MT-1 performance.
On-highway light and heavy-duty trucks, buses and vans.
Off-highway equipment including:
Construction, mining, quarry applications and agriculture.
Heavy-duty industrial gear drives including hypoid gears.
Differentials, final drives, transfer cases and other gear applications where lubricants meeting SAE J2360 (MIL-PRF-2105E), API Service GL-5, EP gear lubricants are recommended.
Recommended for equipment such as winch reduction gears and crawler vehicle propulsion gear drives that are exposed to severe low temperatures.
Recommended where extended service intervals and warranties are required.

SPECIFICATIONS

D-A **SynSure**™ **SAE 75W-90**
Approvals
API GL-5 / MT-1
ArvinMeritor 076-N
Dana SHAES 256 Rev C, SHAES 429
International TMS 6816
Mack G0-J Plus
MIL-PRF-2105E / SAE J2360

D-A **SynSure**™ **SAE 80W-140**
Approvals
API GL-5 / MT-1
ArvinMeritor 0-76-B (petroleum), 0-80 (synthetic)
Dana SHAES 429
International TMS-6816
Mack G0-J
MIL-PRF-2105E / SAE J2360

SynSure™ (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	J306	75W-90	80W-140
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 14.8 154	 18.8 222
Viscosity Index	ASTM D2270	152	146
Pour Point, °F (°C)	ASTM D97	-44 (-42)	-27 (–33)
Flash Point, °F (°C)	ASTM D92	420 (215)	405 (207)
Density @ 60°F, lbs/gal	ASTM D1298	7.39	N/A
FZG Test, Pass Stage	ASTM D5182	12	12
Copper Strip Corrosion	ASTM D130	1a Pass	1a Pass

D-A PART NUMBER

	75W-90	80W-140
Bulk	14421	14451
Drum – 55 Gal	14422	14452
Qtr Drum – 16 Gal	14426	N/A
Pail (Plastic) - 5 Gal	14428	14458

SynSure 2™

D-A **SynSure 2**™ synthetic lubricants are commercial and automotive gear oils which focus on the critical needs of heavy-duty applications. **SynSure 2**™ provides superior lubricant protection in the most severe service conditions, from sub-arctic to desert. **SynSure 2**™ is ideal for use in truck axles operating in standard drain service or in "out-of-warranty" situations where an API Service Category GL-5 lubricant is recommended. **SynSure 2**™ out-performs conventional gear lubricants to promote longer gear life and better equipment operating economy.

PRODUCT FEATURES AND BENEFITS

- Full synthetic gear lubricant providing excellent lubricant flow at a wide range of operating temperatures.
- Contains extreme pressure additives that prevent wear in the most severe applications.
- Rust, corrosion, and oxidation inhibitors to provide superior gear and bearing protection.
- Extremely high film strength prevents metal to metal contact in axles and gearboxes
- Outstanding low temperature performance ensure extra gear life in the toughest service.
- Strong resistance to oxidative and thermal breakdown due to use of premium synthetic components.

TYPICAL APPLICATIONS

D-A **SynSure 2**™ is recommended for heavy duty manual transmissions, axles and final drives requiring API Service Category GL-5 and MT-1 performance. Applications include heavy-duty industrial gear drives (including hypoid gears), differentials, final drives, transfer cases and other gear applications where lubricants meeting SAE J2360 (MIL-PRF-2105E), API Service Category GL-5, API Service Category MT-1 or EP gear lubricants are recommended. Recommended where extended service intervals are required.

On-highway applications include: commercial light and heavy duty trucking, buses and vans.
Off-highway applications include: construction, mining, quarries and agriculture.

Recommended for use as a companion to D-A's **ProDrive – A**™, **ProDrive – E**™ or **ProDrive 2**™ for maximum drivetrain life and fuel economy improvement.

APPROVALS AND SPECIFICATIONS

Meets the known performance requirements of:

API GL-5 / MT-1
SAE J2360
DAF
Ford WSP-M2C197A
GB13895
GE D-50E9C
Harnishfeger (P&H) 474
Mack GO-J
Mentor 076
Navistar 6816
ZF TE-ML 07A
ZF TE-ML 08

SynSure 2™ (cont'd)

TYPICAL PROPERTIES

SAE Viscosity Grade	SAE J306	75W-90	80W-140
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 16.2 111	 29.0 255
Viscosity Index	ASTM D2270	156	150
Pour Point, °F (°C)	ASTM D97	-51 (-46)	-33 (–36)
Flash Point, °F (°C)	ASTM D92	410 (210)	410 (210)
API Gravity	ASTM D4052	N/A	N/A
FZG Test, Pass Stage	ASTM D5182	N/A	N/A

D-A PART NUMBER

	75W-90	80W-140
Bulk	14611	14621
Tote – 330 Gal	14613	14623
Drum – 400 lb	14612LB	14622LB
Qtr Drum – 120 lb	14616LB	14626LB
Pail (Plastic) – 35 lb	14618LB	14628LB

GearTec™

D-A **GearTec**™ is designed to support the performance requirements for the lubrication needs of gear trains and differentials requiring the use of an extreme pressure lubricant, including limited-slip type configurations. This product is formulated with quality base oils and carefully selected additives resulting in a product which will provide excellent anti-wear protection under heavy loads while also guarding against rust and corrosion even when the system is idle. Special inhibitors are also present which limit oil oxidation and deposit formation even at high operating temperatures.

D-A **GearTec**™ is available in two multi-grades and one monograde to provide optimum protection. The multi-grades are formulated without the use of viscosity modifier additives to ensure maximum in-service viscosity retention and minimized gear wear.

PRODUCT FEATURES AND BENEFITS

- Unique balance of extreme pressure additives extends equipment life through minimized gear wear.
- Limits wear during equipment start-up and acceleration, as well as during extreme loading conditions, by minimizing metal-to-metal contact, providing exceptional heavy load protection during low speed/high-torque service.
- Specially formulated to control oxidation and corrosion of all types of metal surfaces.
- Quality base oils and antioxidant additive produce a lubricant with excellent resistance to high temperature degradation for longer lubricant life.
- Incorporated chemistry maintains film strength by eliminating viscosity loss.

TYPICAL APPLICATIONS

Supports the performance requirements of:
Gear Oil applications requiring an API GL-5 or SAE J2360 (formerly MIL-PRF-2105E) including: Most automobile manual transmissions and differentials, including limited-slip off-highway mobile equipment and industrial machinery requiring an EP gear lubricant.

Dana (Spicer) differentials
Eaton (Fuller) differentials
Mack GO-J
Meritor (Rockwell) differentials
Ross and Saginaw steering systems
Wheel bearings

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	80W-90	85W-140	90
AGMA Lubricant Number		4EP	7EP	5EP
API Service Classification		GL-5	GL-5	GL-5
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 14.1 140.3	 28.3 415	 20.0 240
Viscosity Index	ASTM D2270	95	95	95
Pour Point, °F (°C)	ASTM D97	-35 (-37)	5 (–15)	-35 (–37)
Flash Point, °F (°C)	ASTM D92	430 (221)	460 (238)	445 (229)
API Gravity	ASTM D4052	27.2	25.5	26.5
FZG Test, Pass Stage	ASTM D5182	12	12	12
Copper Strip Corrosion	ASTM D130	1b	1b	1b
Timken OK Load, lbs	ASTM D2509	50	50	50

GearTec™ (cont'd)

D-A PART NUMBER

	80W-90	85W-140	90
Bulk	14101	14111	14151
Tote – 330 Gal	14103	14113	N/A
Drum – 400 lb	14102LB	14112LB	N/A
Qtr Drum – 120 lb	14106LB	14116LB	N/A
Pail (Metal) – 35 lb	14109LB	14119LB	14159LB
Pail (Plastic) – 35 lb	14108LB	14118LB	N/A

DTL™

D-A **DTL**™ (**Dirt Tolerant Lubricant**) is a low-friction gear oil specifically formulated to limit the damage caused by dirt and water contamination in gear assemblies. It is chemically engineered to offer extended equipment life, reduced maintenance and energy costs and improved operational efficiency.

PRODUCT FEATURES AND BENEFITS

- Specifically formulated to help prevent catastrophic equipment failure caused by dirt and water contamination.
- Unique composition inhibits abrasive wear caused by water contamination protecting vital components and extending equipment life.
- Thermal and oxidation stability reduces sludge and varnish deposits on gear assemblies preventing seal deterioration, oil thickening and premature component failure.
- Extreme pressure additives form a protective chemical film designed to minimize gear wear while producing a cooler running compartment for reduced energy costs and higher work output.
- Molybdenum disulfide solid lubricant conditions gears to reduce noise and friction.
- Highly functional chemical inhibitors provide lasting protection against rust and corrosion which further reduces abrasive gear wear and maintains component condition.

TYPICAL APPLICATIONS

All applications requiring an API GL-5 or MIL-PRF-2105E/J-2360 lubricant including:
Dana (Spicer) differentials
Eaton (Fuller) differentials
Rockwell differentials
Most automobile and light truck differentials, some automotive manual transmissions
Ross and Saginaw steering systems
Wheel bearings (oil lubricated)
Off-highway mobile equipment and industrial machinery requiring an EP gear lubricant

NOTE: Excluding limited slip differentials

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	85W-140
AGMA Lubricant Number		6EP
API Service Classification		GL-5
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 26.3 342
Viscosity Index	ASTM D2270	101
Pour Point, °F (°C)	ASTM D97	1 (–17)
Flash Point, °F (°C)	ASTM D92	460 (238)
API Gravity	ASTM D4052	25.9
Copper Strip Corrosion	ASTM D130	1a
Foam Test	ASTM D892	Pass
Timken OK Load, lbs	ASTM D2509	65

DTL™ (cont'd)

D-A PART NUMBER

	85W-140
Bulk	14131
Drum – 400 lb	14132
Pail (Plastic) – 35 lb	14138LB

GearSyn RO™

D-A **GearSyn RO**™ is a full synthetic, multipurpose rust and oxidation (R&O) inhibited industrial gear lubricant. **GearSyn RO**™ offers exceptional high temperature stability and excellent low temperature flow when lubricating industrial gear sets and bearings. D-A **GearSyn RO**™ rapidly separates from water while protecting metal surfaces from rust and corrosion. D-A **GearSyn RO**™ is extremely durable in severe service. This can result in an opportunity to reduce overall operating costs when compared to usage of mineral oil gear lubricants. Additionally, the D-A **GearSyn RO**™ formulation is optimized for use in positive displacement blowers, promoting maximum equipment life and minimizing wear. It is able to provide outstanding protection even in demanding operating conditions. D-A **GearSyn RO**™ can withstand blower discharge temperatures up to 250°F.

PRODUCT FEATURES AND BENEFITS

- This full synthetic formulation provides outstanding resistance to high temperature thermal stress and oxidation. Longer oil life results while providing exceptional lubrication protection.
- Excellent fluidity at low temperatures and low co-efficient of friction at all temperatures permits easier start-ups and energy efficient operation.
- A unique combination of synthetic base oils and anti-wear additives provide low gear and bearing wear.
- Special additives minimize corrosion of bronze and copper metals and at the same time protect iron and steel components from rusting.
- Rapid water separation minimizes potential damage caused by exposure of lubricated surfaces to free water.
- Longer oil life, longer gear and bearing life and excellent lubricity and flow properties provide reduced maintenance costs and greater operating efficiency.
- Compatible with a wide variety of seal materials including Teflon®, fluorosilicone, polysulfide, polyacrylic, Viton®, fluorocarbon and nitrile Buna-N®.

TYPICAL APPLICATIONS

Moderately loaded industrial gears
Stationary and mobile equipment, antifriction and journal bearings
Enclosed gearboxes requiring R&O lubricants
Steel-on-steel and steel-on-bronze fittings
Circulating oil systems
Positive Displacement Blowers (ISO 68-220)

Supports the performance requirements of:
AGMA 9005-E02 (R & O)
AIST (US Steel) 120
DIN 51515-1 (ISO 68, 100)
DIN 51524, Parts 1 and 2 (ISO 68-150)

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	68	100	150	220	320	460
AGMA Lubricant Number		2	3	4	5	6	7
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 10.3 68	 14 100	 19.1 151	 26 225	 33.3 321	 43.2 460
Viscosity Index	ASTM D2270	138	142	144	148	146	146
Pour Point, °F (°C)	ASTM D97	-35 (-37)	-36 (-38)	-36 (-38)	-35 (-37)	-30 (34)	-20 (-29)
Flash Point, °F (°C)	ASTM D92	480 (249)	460 (238)	460 (238)	455 (235)	451 (233)	447 (231)
API Gravity	ASTM D4052	34.1	33.2	32.3	31.3	30.6	29.7
Copper Strip Corrosion	ASTM D130	1b	1b	1b	1b	1b	1b
Foam Test	ASTM D892	Pass	Pass	Pass	Pass	Pass	Pass

GearSyn RO™ (cont'd)

D-A PART NUMBER

	68	100	150	220	320	460
Bulk	N/A	N/A	N/A	14851	N/A	14871
Tote – 330 Gal	N/A	N/A	14843	N/A	N/A	N/A
Drum – 400 lb	14822LB	14832LB	14842LB	14852LB	14862LB	14872LB
Pail (Metal) – 35 lb	14829LB	14839LB	14849LB	14859LB	14869LB	N/A
Pail (Plastic) – 35 lb	14828LB	14838LB	14848LB	14858LB	14868LB	14878LB

TorGuard FD™

D-A **TorGuard FD**™ are performance engineered lubricants designed specifically for final drive axle oil (FDAO) type applications that require the Caterpillar FD-1 specification.

D-A **TorGuard FD**™ when used under normal operating conditions, can have drain intervals up to 3,000 operating hours. Special additives are added to control foaming tendencies while deterring pitting and scuffing within gears and bearings. In addition, the robust additive package controls rust and exhibits very good oxidation stability to combat contact fatigue within the drive system.

D-A **TorGuard FD**™ is not recommended for final drive components that contain frictional materials such as wet disk systems.

PRODUCT FEATURES AND BENEFITS

- Longer bearing and gear life.
- Protects against pitting, wear, and scuffing for gears and bearings.
- Superior wear protection under high torque, low speed operating conditions.
- Improved protection against rust and corrosion.
- Excellent oxidation stability to reduce deposits and minimize viscosity oxidative thickening throughout the drain cycle.
- Reduced foaming tendencies result in lower wear rates in high- pressure contact areas.

TYPICAL APPLICATIONS

D-A **TorGuard FD**™ are performance engineered lubricants designed specifically for final drive and axle (FDAO) type applications that require the Caterpillar FD-1 specification.

D-A **TorGuard FD**™ is recommended for use in selected models and compartments such as: forestry equipment, off-highway trucks and track-type tractors.

In applications where D-A **TorGuard FD**™ is recommended, the factory fill oil for standard configured machines is SAE 60 however, Machine Operating Manuals should be consulted to select the appropriate grade for prevailing ambient temperatures.

D-A **TorGuard FD**™ may be used in any other equipment that requires fluids meeting the Caterpillar FD-1 specification.

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	60
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 25.45 332.7
Viscosity Index	ASTM D2270	99
Pour Point, °F (°C)	ASTM D97	-2 (-19)
Flash Point, °F (°C)	ASTM D92	>478 (>248)
API Gravity	ASTM D4052	26.1

D-A PART NUMBER

Bulk	53161
Tote – 330 Gal	53163

Rock Drill™

D-A **Rock Drill Oil** is specially designed for use in extreme working conditions with percussive pneumatic tools, down-the-hole (DTH), and surface drilling equipment. This lubricant begins with naturally high viscosity index base oils for temperature shear stability and is formulated with our advanced **ChemGuard**™ additive technology.

The D-A **ChemGuard**™ innovative formula has a vigorous EP/anti-wear inhibitor that reduces welding or scoring when under constant shock and high load situations. It protects against rust and corrosion and also has a built-in emulsifier for severe circumstances where water and compressed air co-exist. A robust tackifier is added for the preferred adhesiveness that protects against undesired misting or when water spray is present and sustains its strength where superior lubricity is expected.

D-A **Rock Drill Oil** may also be utilized in Mining and Tunneling, Jack-Hammers, Paving Breakers, Chippers, Tampers, Scalers, Impacters, Roofbolters, Screamer Pumps and Water Injection Plunger Pumps.

PRODUCT FEATURES AND BENEFITS
- Excellent temperature and shear stability
- Robust tackifier, adheres to metals for decreased galling, shanking or burning of parts
- Exceptional emulsifying agent for enhanced lubricity
- Utilizes **ChemGuard**™ EP/anti-wear additive package to help reduce wear

TYPICAL APPLICATIONS
Air Line lubrication for all Rock Drills. (Also makes an excellent airline oil for pneumatic tools such as Paving Breakers, Hammers, Chippers, Tampers, Scalers, Impacters, etc.) Rock Drill is also an excellent bar oil for chain saws.

General Remarks: In extremely cold weather, consult the manufacturer's operating or service manual.

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	46	68	100	150	220	320
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 7.30 46.65	 9.10 68.13	 11.63 100.3	 15.44 150.3	 19.44 220.4	 24.75 320.3
Viscosity Index	ASTM D2270	118	109	104	101	100	99
Pour Point, °F (°C)	ASTM D97	-31 (-35)	-31 (-35)	-22 (-30)	-13 (-25)	5 (-15)	5 (-15)
Flash Point, °F (°C)	ASTM D92	420 (216)	425 (218)	435 (224)	445 (229)	455 (235)	465 (241)
Density, lb/gal	Calculated	7.20	7.27	7.35	7.42	7.46	7.53
Copper Strip Corrosion	ASTM D130	1lb	1lb	1lb	1lb	1lb	1lb
Foam Test	ASTM D892	Pass	Pass	Pass	Pass	Pass	Pass
Rust Test	ASTM D665A	Pass	Pass	Pass	Pass	Pass	Pass
4 Ball EP Load, Kgf	ASTM D2783	250	250	250	250	250	250

D-A PART NUMBER

	46	68	100	150	220	320
Bulk	N/A	145.21	14531	14541	14551	14561
Tote – 330 Gal	N/A	N/A	14533	N/A	14553	14563
Pail (Plastic) – 5 Gal	14518	14528	14538	14548	14538	14568
Drum – 55 Gal	N/A	N/A	14532	N/A	N/A	N/A

eco-drill™

D-A **eco-drill**™ is a readily biodegradable rock drill oil specially designed for use in extreme working conditions with percussive pneumatic tools, down-the-hole (DTH), and surface drilling equipment. This lubricant begins with naturally high viscosity index base oils for temperature shear stability and is formulated with our advanced **ChemGuard**™ additive technology.

The D-A **ChemGuard**™ innovative formula has a vigorous EP/anti-wear inhibitor that reduces welding or scoring when under constant shock and high load situations. D-A **eco-drill**™ protects against rust and corrosion and contains a built-in emulsifier for severe circumstances where water and compressed air co-exist. A robust tackifier is added for the preferred adhesiveness that protects against undesired misting or when water spray is present and sustains its strength where superior lubricity is expected. D-A **eco-drill**™ is rigorously tested for its performance as well as its environmentally safe components. This product is highly recommended for use in monitored or environmentally sensitive locations. D-A **eco-drill**™ may also be utilized in Mining, Tunneling, Jack-Hammers, Paving Breakers, Chippers, Tampers, Scalers, Impactors, Roof Bolters, Screamer Pumps and Water Injection Plunger Pumps.

PRODUCT FEATURES AND BENEFITS

- Excellent temperature and shear stability
- Robust tackifier, adheres to metals for decreased galling, shanking or burning of parts
- Exceptional emulsifying agent for enhanced lubricity
- Vigorous ChemGuard™ EP/anti-wear additive package
- Readily Biodegradable

TYPICAL APPLICATIONS

Readily Biodegradable Air Line lubrication for all Rock Drills. (Also makes an excellent Air Line Oil for pneumatic tools such as Paving Breakers, Hammers, Chippers, Tampers, Scalers, Impactors, etc.).

eco-drill™ is also an excellent bar oil for chain saws.

General Remarks: In extremely cold weather, consult the manufacturer's operating or service manual.

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	100	150	220
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 17.8 98	 23.4 156	 28.2 216
Viscosity Index	ASTM D2270	185	180	175
Pour Point, °F (°C)	ASTM D97	-10 (-23)	0 (-18)	5 (-15)
Flash Point, °F (°C)	ASTM D92	550 (288)	574 (301)	574 (301)
API Gravity	ASTM D4052	19.0	17.9	17.7
Four Ball EP, Weld Load @ 500kg	ASTM D2783	91.4	91.4	91.4
Four Ball Load Wear, Scar Dia., mm	ASTM D4172	0.41	0.41	0.41
Falex Pin & Vee Block Max load in lbs.	ASTM D3233	3500	3500	3500

D-A PART NUMBER

	100	150	220
Bulk	14241	14251	14261
Tote – 275 Gal	14247	14257	N/A
Pail(Plastic) – 5 Gal	N/A	14258	N/A

PennGrade 1® Multi-Purpose 'Classic' Gear Oil GL-4 SAE 80W-90

PennGrade 1® Multi-Purpose 'Classic' Gear Oil GL-4 SAE 80W-90 is a specially blended using high quality premium mineral base stocks and select additive technologies. It is designed to be used with "yellow" metallurgy (brass, bronze, copper) and other 'soft' metals used in synchronizers, bushings, thrust washers and other components typically found in classic manual transmissions and transaxles. In applications specifying API GL-4 quality lubricants, use of API GL-5 lubricants with higher extreme pressure additive activity/concentration can damage these 'soft' metal components. It is not intended for use in 'limited slip' applications and does not contain friction modifiers which can interfere with proper synchronizer performance. **PennGrade 1® Multi-Purpose 'Classic' Gear Oil GL-4 SAE 80W-90** is recommended for use in such time-honored traditional manual transmissions as those made by Muncie, Rockwell, NVG/New Process, Borg-Warner, Saginaw, Mercury and Ford "Toploader" as well as those used in many imports. It is suitable for use in Nissan UD trucks, Mitsubishi Fuso trucks, Volvo trucks and Mercedes Benz truck manual transmissions as well as the transmissions/transaxles on Nissan cars and SUV's, Mitsubishi vehicles and Suzuki vehicles calling for an API GL-4 level lubricant. Not for use in applications requiring API GL-5 quality extreme pressure (EP) lubricants or where OEM specialized fluids are mandated. Always consult the equipment owner's manual for proper fluid selection.

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	80W-90
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 15 138.3
Viscosity Index	ASTM D2270	102
Pour Point, °F (°C)	ASTM D97	-27 (-33)
Flash Point, °F (°C)	ASTM D92	450 (232)
API Gravity	ASTM D4052	28.4
Density, lbs/gal	Calculated	7.385

D-A PART NUMBER

Case – 12/1 Qt	77296

PennGrade 1® Full Synthetic Hypoid Gear/Blower Racing Lubricant

PennGrade 1® Full Synthetic Hypoid Gear/Blower Racing Lubricant is a specially formulated 100% synthetic, SAE 75W-90 oil designed for use with self-contained systems where SAE 75W, SAE 80W-90 or SAE 90 grade gear oils are recommended. It is suitable for use in Roots and Lysholm Screw type superchargers and may be used in manual transmissions and hypoid differentials where high shock loading is a concern.

PennGrade 1® Full Synthetic Hypoid Gear/Blower Racing Lubricant may reduce overall oil temperatures by as much as 15°F over conventional gear lubes resulting in longer component life, less drag and more horsepower. This unique formulation offers excellent antifoam characteristics as measured by ASTM D892 and meets or exceeds the following performance requirements of MIL-PRF-2105E, SAE J2360, API MT-1, API GL-5 and Mack GO-J.

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	75W-90
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 16.2 111
Viscosity Index	ASTM D2270	140
Pour Point, °F (°C)	ASTM D97	-50 (-46)
Flash Point, °F (°C)	ASTM D92	410 (210)
API Gravity	ASTM D4052	33.2
Copper Strip Corrosion	ASTM D130	1a
FZG Test, Pass Stage	ASTM D5182	12

D-A PART NUMBER

Case – 12/1 Qt	77666

PennGrade 1® Limited Slip GL-5 Gear Oil SAE 80W-90

PennGrade 1® Limited Slip GL-5 SAE 80W-90 Gear Oil is a specifically developed friction modified lubricant for clutch-type, limited slip differentials, reducing stick-slip 'chatter' in low speed high torque operations. It is formulated with premium grade base stocks, a skillfully tailored additive system and is recommended when an SAE 80W, 90 or 80W-90 viscosity is required.

PennGrade 1® Limited Slip GL-5 SAE 80W-90 Gear Oil is designed for limited slip differentials in passenger cars, vans, SUV's, on-or off-road recreational vehicles and light duty trucks. It is ideally suited for use in 'classic' car limited slip differential systems such as the Chevrolet Posi-traction, Ford Motor Co. Traction-Lok, Pontiac Saf-T-Track, Mopar Sure Grip and similar applications. **PennGrade 1® Limited Slip GL-5 SAE 80W-90 Gear Oil** is fit for use in applications requiring API MT-1, MIL-PRF-2105E, SAE J2360, Mack GO-J and GO-H, API Service GL-5, Navistar B-22, Meritor Automotive O-76-A and O-76-D as well as Ford M2C197-A and M2C118-A.

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	80W-90
AGMA Lubricant Number		4EP
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 14.1 140.3
Viscosity Index	ASTM D2270	100
Pour Point, °F (°C)	ASTM D97	N/A
Flash Point, °F (°C)	ASTM D92	429 (221)
API Gravity	ASTM D4052	28.3
Density, lbs/gal (g/L)	Calculated	7.39 (888.3)
FZG Test, Pass Stage	ASTM D5182	12a
Copper Strip Corrosion	ASTM D131	1b

D-A PART NUMBER

Case – 12/1 Qt	77326

HydraSafe HiVi™

HydraSafe HiVi™ is a high viscosity index, high performance anti-wear hydraulic fluid specially designed to meet the needs of industrial and modern high-pressure hydraulic systems. **HydraSafe HiVi**™ is environmentally sensitive due to its zinc free anti-wear additives that provide a well-balanced performance in a wide range of applications. The product line is constructed from high quality thermally stable base stocks to deliver extended drain intervals. The shear stable high viscosity index offers a wide operating temperature range while maintaining superior film strength to protect internal componentry. The Zinc free anti-wear system provides excellent protection of yellow metal often found in gear, vane, and piston pumps. **HydraSafe HiVi**™ has been rigorously tested for its durability while simultaneously passing environmental tests to deliver a low toxicity, environmentally sensitive hydraulic fluid.

PRODUCT FEATURES AND BENEFITS
- Capable of extending oil drains resulting in reduced oil disposal costs.
- Excellent filterability provides protection of critical hydraulic system components.
- Superior air separation characteristics help prevent aeration and cavitation damage.

TYPICAL APPLICATIONS
Meets the performance requirements of:
Bosch Rexroth RE 90220
Denison HF-0
DIN 51524 Part II
Eaton Vickers M-2950-S
ISO 11158
MAG IAS P68/P69/P70

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	22	32	46	68	100
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 5.21 22	 6.59 32	 8.58 46	 11.38 68	 15.22 104.9
Viscosity Index	ASTM D2270	165	160	160	160	153
Pour Point, °F (°C)	ASTM D97	-68 (-56)	-54 (-48)	-50 (-46)	-47 (-44)	-41.8 (-41)
Flash Point, °F (°C)	ASTM D92	431 (222)	467 (242)	464 (240)	473 (245)	455 (235)
API Gravity	ASTM D4052	36.4	35.5	34.8	32.5	31.3
FZG Test, Pass Stage	ASTM D5182	N/A	12	12	12	12
Copper Strip Corrosion	ASTM D130	1b	1b	1b	1b	1b
Foam Test	ASTM D892	Pass	Pass	Pass	Pass	Pass
Dielectric Strength, KV (min)	ASTM D877	N/A	35	35	35	N/A

D-A PART NUMBER

	22	32	46	68	100
Bulk	54001	N/A	54021	N/A	N/A
Tote – 330 Gal	54003	N/A	N/A	N/A	54043
Drum – 55 Gal	54002	54012	54022	54032	N/A
Pail (Plastic) – 5 Gal	54008	54018	54028	54038	N/A

HydraSafe™

D-A HydraSafe™ is a specially designed hydraulic fluid for use in monitored or environmentally sensitive heavy-duty applications. This premium lubricant begins with naturally high viscosity index base oils for temperature shear stability and is formulated with our advanced **ChemGuard**™ additive technology.

The D-A proprietary **ChemGuard**™ innovative formula has vigorous EP/anti-wear inhibitors resulting in wear control on steel, brass, and bronze parts. An exceptional anti-rust and anti-oxidation additive has been included to significantly limit rusting of ferrous and corrosion of yellow metals. In addition, the robust D-A **ChemGuard**™ technology improves demulsification, provides hydrolytic stability, and greatly reduces foaming, sludge and varnishing. This environmentally responsible zinc and calcium free formula also provides excellent air release characteristics and cold temperature pumping capability. D-A **HydraSafe**™ is rigorously tested for its durability as well as its environmentally safe, low toxicity component performance. D-A **HydraSafe**™ may be utilized to protect and extend equipment life in mobile or stationary hydraulic systems, agriculture, forestry, mining, dredging, off-shore platforms, tunneling, waste management and many other environment sensitive areas.

PRODUCT FEATURES AND BENEFITS

- Naturally high viscosity index base oils provide temperature shear stability.
- Vigorous EP/anti-wear inhibitors control wear on steel, brass and bronze parts.
- Exceptional anti-rust and anti-oxidation additive limit oxidizing of ferrous metals and corrosion on yellow metals.
- Ashless formulation provides excellent air release characteristics and cold pumping capability.

TYPICAL APPLICATIONS

Axial Piston Pumps	P-68 (ISO 32), P-69 (ISO 68), P-70 (ISO 46)DIN
Construction Machinery	51524-2
Hydraulic Power Systems	Eaton 35VQ25 - all grades
Hydraulic Drills	ISO 1158 HM
Piston Pumps	ISO 20763
ASTM D6158	Parker Hannifin HF0, HF1, HF2 - all grades
	SAE MS 1004

TYPICAL PROPERTIES

Applies to all grades:

	Standard	Test Data	Classification
Toxicity	OECD 203	96-h LL50>1000	Non-Toxic
Biodegradability	OECD 301B	22% @ 28 days	Inherently biodegradable

ISO Viscosity Grade	Test Method	32	46	68
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 5.56 32	 7.0 46	 8.97 68
Viscosity Index	ASTM D2270	110	108	105
Pour Point, °F (°C)	ASTM D97	-29 (-34)	-26 (-32)	-22 (-30)
Flash Point, COC, °F (°C)	ASTM D92	400 (204)	425 (218)	440 (227)
API Gravity	ASTM D4052	32.0	31.6	31.0
Dielectric Strength, KV (min)	ASTM D877	35	35	35

HydraSafe™ (cont'd)

D-A PART NUMBER

	32	46	68
Bulk	N/A	55081	N/A
Tote – 330 Gal	55073	55083	55063
Drum – 55 Gal	55072	55082	55062
Pail (Plastic) – 5 Gal	55078	55088	N/A

eco-flo™

D-A **eco-flo**™ series is a performance engineered, readily biodegradable, non-toxic hydraulic oil. It is specifically designed for use in environmentally sensitive applications for all modern high pressure hydraulic powered systems. This lubricant begins with naturally high viscosity index base oils for temperature shear stability and is formulated with our advanced **ChemGuard**™ additive technology.

The D-A **ChemGuard**™ innovative formula has vigorous anti-wear inhibitors that effectively reduce scuffing and wear in severe environments. It also delivers superior protection against corrosion and combats against rust and oxidation (R&O) for industrial gear applications.

D-A **eco-flo**™ series is rigorously tested for its performance as well as its environmentally safe components. This product is highly recommended for use in monitored or environmentally sensitive locations.

PRODUCT FEATURES AND BENEFITS

- Limits wear in low and high pressure vane pumps for longer pump life and reduced operating cost.
- Provides wear control for steel, brass and bronze pump parts when operating at maximum pressure ratings, resulting in excellent pump protection and more cost efficient operation.
- Can be used in both mobile and stationary hydraulic equipment as well as applications requiring an R & O oil for gear box and speed reducer lubrication, giving service flexibility and minimized inventory.
- Special rust and corrosion inhibitors limit rusting of ferrous metals and corrosion of yellow metals.

TYPICAL APPLICATIONS

Axial Piston Pumps
Construction Machinery Hydraulic
Power Systems Hydraulic Drills
Industrial Gear Drives
Rotary Air Compressors

ASTM D6158
Bosch Rexroth RE 90220
Cincinnati Machine
P-68 (ISO 32), P-69 (ISO 68),
P-70 (ISO 46)
Commercial Hydraulics

DIN 51524, part 2
Eaton-Vickers 35VQ25
General Motors LS-2 (LH-03-1,
LH-04-1, LH-06-1)
ISO 11158
Parker Hannifin HF0, HF1, HF2
SAE MS 1004

eco-flo™ (cont'd)

TYPICAL PROPERTIES

Applies to all grades:

	Standard	Test Data	Classification
Biodegradability	OECD 301B	>60% @ 28 days	Readily biodegradable

ISO Viscosity Grade	Test Method	32	46	68
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 7.5 32	 9.5 46	 68 13.6
Viscosity Index	ASTM D2270	207	210	210
Pour Point, °F (°C)	ASTM D97	-36 (-38)	-35 (-37)	-31 (-35)
Flash Point, COC, °F (°C)	ASTM D92	500 (260)	510 (266)	530 (277)
API Gravity	ASTM D4052	21.2	20.6	20.0

D-A PART NUMBER

	32	46	68
Bulk	53321	N/A	N/A
Tote – 330 Gal	53323	N/A	N/A
Drum – 55 Gal	53322	53332	53342
Pail (Plastic) - 5 Gal	53328	N/A	N/A

Mining Fluid

D-A **Mining Fluid** is a hydraulic fluid designed to support the performance requirements of modern high pressure hydraulic systems used in construction equipment and stationary industrial and mining installations - both underground and surface. This anti-wear hydraulic oil is formulated with oxidation and corrosion inhibitors as well as anti-foam and anti-wear additives for protection against scuffing and wear in hydraulic pumps and motors.

D-A **Mining Fluid** is sold in metal pails, palletized and plastic wrapped to provide maximum protection and allow minimum handling.

PRODUCT FEATURES AND BENEFITS

- Limits wear in low and high pressure piston and vane pumps for longer pump life and reduced operating cost.
- Provides wear control for steel, brass and bronze pump part s, resulting in pump protection and more cost efficient operation.
- Special rust and corrosion inhibitors limit rusting of ferrous metals and corrosion of yellow metals.
- Water separation/demulsibility helps protect equipment in wet service environments.

TYPICAL APPLICATIONS

Axial Piston Pumps
Construction Machinery
Hydraulic Drills
Hydraulic Power Systems
Industrial Gear Drives
Rotary Air Compressors

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	68	100	150
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 8.68 68	 11.3 100	 14.6 150
Viscosity Index	ASTM D2270	96	95	95
Pour Point, °F (°C)	ASTM D97	-20 (-29)	0 (-18)	10 (-12)
Flash Point, °F (°C)	ASTM D92	445 (229)	460 (238)	465 (241)
API Gravity	ASTM D1298	30.0	29.5	28.5
Oxidation Life, Typical Hours	ASTM D943	2000+	2000+	2000+

D-A PART NUMBER

	68	**100**	**150**
Bulk	55561	55661	55761
Drum – 55 Gal	55562	N/A	N/A
Square Metal Can (40 per) – 35 lb	55589	55679	55769

R&O Oil

D-A **R&O Oil** is designed for all modern hydraulic power systems where a rust and oxidation (R&O) oil is recommended. This oil is formulated with a high level of R&O inhibitors for maximum protection against rust and oxidation in hydraulic pumps and motors. D-A **R&O Oil** also provides superior service in industrial gear applications requiring R&O inhibited lubricants.

PRODUCT FEATURES AND BENEFITS

- Provides wear control for steel, brass and bronze pump parts when operating at system pressures not requiring anti-wear additives, resulting in excellent pump protection and more cost efficient operation.
- Can be used in hydraulic equipment as well as applications requiring an R&O oil for gear box and speed reducer lubrication giving service flexibility and minimized lubricant inventory.
- Special rust inhibitors limit rusting of ferrous metals.

TYPICAL APPLICATIONS

Supports the Performance Requirements of:
AGMA 9005-E02 (R&O)
Dennison HF-1, DIN 51524 Part 1

Recommended for Use where R&O Oils are permitted in:
Hydraulic Power Systems
Hydraulic Drills Hydraulic Pumps Air Compressors
Industrial Gear Drives

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	32	46	68	100	150	220	320
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 5.3 32	 6.8 46	 8.8 68	 11.3 100	 15.7 162.5	 19.3 220	 25 320
Viscosity Index	ASTM D2270	96	99	100	95	98	99	99
Pour Point, °F (°C)	ASTM D97	-35 (-38)	-30 (-34)	-13 (-25)	0 (-18)	-18 (-28)	0 (-18)	17 (-8)
Flash Point, °F (°C)	ASTM D92	405 (207)	425 (218)	420 (216)	460 (238)	500 (260)	465 (241)	490 (254)
API Gravity	ASTM D4052	31.7	31	30.3	29.5	28.3	27.8	27.0

D-A PART NUMBER

	32	46	68	100	150	220	320
Bulk	54711	54721	54731	54741	54751	54761	54771
Tote – 330 Gal	54713	54723	54733	54743	54753	N/A	54873
Tote – 275 Gal	54717	54727	N/A	N/A	N/A	N/A	N/A
Drum – 55 Gal	54712	54722	54732	54742	54752	54762	54772
Pail (Metal) – 35 lb	54719	54729	54739	54749	54759	54769	N/A
Pail (Plastic) – 35 lb	N/A	N/A	N/A	N/A	N/A	N/A	N/A

PresurFlo FR™

D-A **PresurFlo FR**™ is a premium, water-glycol, fire resistant fluid formulated with diethylene glycol. It is designed to provide optimum performance in hydraulic systems where fire resistant fluids are required.

D-A **PresurFlo FR**™ contains an adequate amount of water to prevent ignition that could occur in hydraulic systems operating under high pressure through sudden line ruptures or fluid contact with a high temperature source. **PresurFlo FR**™ includes additives that provide lubricity, corrosion protection and the overall performance demanded by today's high-performance hydraulic systems. D-A **PresurFlo FR**™ contains no nitrites or nitrosamines.

D-A **PresurFlo FR**™ provides a high viscosity index, low pour point and excellent heat transfer and anti-foam performance. These properties along with the addition of an anti-wear component, provide extended pump life in systems operating under high pressure or overloaded conditions.

PRODUCT FEATURES AND BENEFITS

- Fire resistant to increase job site safety.
- Limits wear in high pressure vane pumps for longer pump life and reduced operating cost.
- Provides wear control for steel, brass and bronze pump parts when operating at maximum pressure ratings, resulting in excellent pump protection and more cost efficient operation.
- Specifically blended to prevent combustion if fluid should come in contact with a high temperature source.

TYPICAL APPLICATIONS

For use in most types of hydraulic equipment found in steel mills, die-casting and transmission plants.
U.S. Steel Requirement #171
USDA Classification H2

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	46
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 8.8 41.8
Viscosity Index	ASTM D2270	N/A
Pour Point, °F (°C)	ASTM D97	-53 (-47)
Flash Point, °F (°C)	ASTM D92	None
API Gravity	ASTM D4052	9.1
Four Ball Wear Test, 40kg load (mm)	ASTM D2266	0.7
Brix Reading, AO Model 10431		44.5
pH		9.4
Color	Visual	Red
Liquid and vapor Phase Corrosion of Steel		Nil

D-A PART NUMBER

Drum – 55 Gal 55252

PresurFlo HiVi™

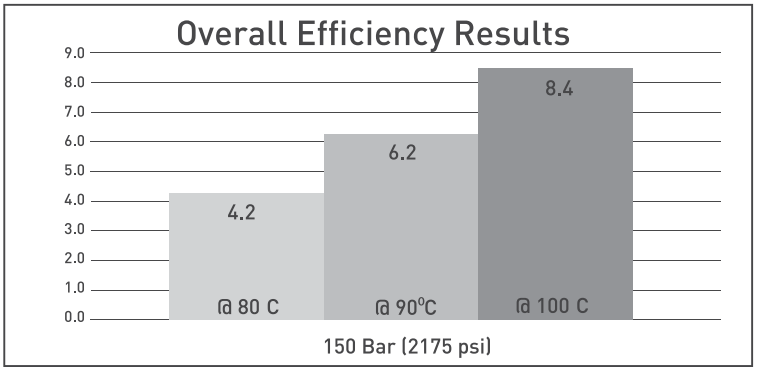
PresurFlo HiVi™ is a high performance anti-wear hydraulic fluid that is specifically designed to meet the needs of industrial, high pressure, and mobile equipment. The shear stable high viscosity index allows for a wide operating temperature range while maintaining maximum hydraulic efficiency. The products are formulated with the highest quality base oils and a proprietary additive system that provides extraordinary performance in high pressure hydraulic systems. **PresurFlo HiVi**™ ISO 15 has a high dielectric strength (40 kV) for use in electrical service equipment, such as cherry pickers. **PresurFlo HiVi**™ has been extensively tested in the laboratory and in-service field testing to provide quantifiable increases in hydraulic efficiency. Hydraulic efficiency benefits can translate to increased machine productivity and reduced fuel consumption. The energy efficiency of **PresurFlo HiVi**™ relates solely to the fluid performance when compared to a conventional hydraulic fluid.

PRODUCT FEATURES AND BENEFITS

- Quantifiable hydraulic efficiency provides up to 8% increase in hydraulic pump efficiency when compared to conventional hydraulic fluids.
- Superior varnish control reduces system deposits leading to increased component life.
- Outstanding air release properties prevent aeration and cavitation damage in low residence time systems.
- Shear stable high viscosity index delivers greater lubrication over a wide temperature range.
- Excellent anti-wear protection helps reduce wear and protects pumps and components for extended equipment life.
- Superior oxidation control and thermal stability may lead to extended oil drain intervals even under severe operating conditions.

TYPICAL APPLICATIONS

Industrial and mobile equipment hydraulic systems operating at high pressures and temperatures.
Hydraulic systems where cold start-up and high operating temperatures are typical.
Hydraulic systems requiring a high load-carrying capability and anti-wear protection.
PresurFlo HiVi™ ISO 15 can be used in applications requiring hydraulic fluids with dielectric strength, such as:
Hydraulic elevators, hoists and lifts
Electrical service equipment (cherry pickers), mobile construction equipment, and hydraulic control systems for machine tools and presses.



PresurFlo HiVi™ (cont'd)

APPROVALS AND SPECIFICATIONS
PresurFlo HiVi™ has the following OEM approval:
Parker Denison HF-0

PresurFlo HiVi™ supports the performance requirements of:
ASTM D6158
Bosch Rexroth RD90220
DIN 51524 Part 1, 2, 3
Eaton Brochure 03-401-2010
General Motors LS-2
JCMAS HK
MAG IAS P-68, P-69, P-70
Parker Denison HF-1, HF-2
SAE MS1004
Sauer Danfoss
US Steel 127 and 136

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	15	32	46	68
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 3.8 15	 6.8 31.7	 9.2 46.5	 12.2 68.6
Viscosity Index	ASTM D2270	155	180	180	180
Pour Point, °F (°C)	ASTM D97	-81.4 (63)	-63 (-53)	-56 (-49)	-53 (-47)
Flash Point, °F (°C)	ASTM D92	325 (162)	410 (210)	425 (218)	440 (267)
API Gravity	ASTM D1298	35.6	33.1	32	30.7
Dielectric Strength, kV (min)	ASTM D877	40	40	40	40
Oxidation Life, Typical Hours	ASTM D943	10000	10000	10000	10000

D-A PART NUMBER

	15	32	46	68
Bulk	55391	55361	55371	55381
Tote – 330 Gal	55393	55363	55373	55383
Drum – 55 Gal	N/A	55362	55372	55382
Pail (Plastic) – 5 Gal	N/A	55368	55378	N/A

PresurFlo™

D-A **PresurFlo**™ hydraulic fluid is designed for all modern high-pressure hydraulic power systems used in construction equipment and stationary industrial installations. These oils are formulated with an optimum level of anti-wear additive for maximum protection against scuffing and wear in hydraulic pumps and motors. Extensive testing has shown these oils exhibit excellent resistance to foaming and oxidation and have excellent anti-rust properties.

PRODUCT FEATURES AND BENEFITS

- Limits wear in low- and high-pressure vane pumps for longer pump life and reduced operating cost.
- Provides wear control for steel, brass and bronze pump parts when operating at maximum pressure ratings, resulting in excellent pump protection and more cost-efficient operation.
- Can be used in both mobile and stationary hydraulic equipment, giving service flexibility and minimized inventory.
- Special rust and corrosion inhibitors limit rusting of ferrous metals and corrosion of yellow metals.
- Water separation/demulsibility helps protect equipment in wet service environments.

TYPICAL APPLICATIONS

Supports the performance requirements of:

AIST (U.S. Steel) 126, 127
ASTM D6158 HM
Axial Piston Pumps
Bosch Rexroth RD 90220
Bosch Variable Volume
Vacuum Pump
Cincinnati Machine
P-68 (ISO 32), P-69 (ISO 68)
P-70 (ISO 46)
Commercial Hydraulics
Construction Machinery
Denison HF-0, HF-1, HF-2
DIN 51524, parts 1, 2, 3
Eaton Brochure 03-401-2010
Eaton-Vickers I-286S, M-2950-S
General Motor LS-2
Hydraulic Power Systems
Hydraulic Drills
Industrial Gear Drives
ISO 11158 HM
JCMAS HK P041
MAG IAS
Rotary Air Compressors
SAE MS 1004
Sauer Danfoss SEB 18122
US Steel

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	32	46	46
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 5.4 32	 6.9 46	 8.7 68
Viscosity Index	ASTM D2270	105	105	100
Pour Point, °F (°C)	ASTM D97	-35 (-37)	-24 (-31)	-13 (-25)
Flash Point, °F (°C)	ASTM D92	410 (210)	450 (232)	450 (232)
API Gravity	ASTM D1298	31.2	31	30
Dielectric Strength, kV (min)	ASTM D877	40	40	40
Oxidation Life, Typical Hours	ASTM D943	6000	6000	6000

PresurFlo™ (cont'd)

TYPICAL PROPERTIES (cont'd)

ISO Viscosity Grade	Test Method	100	150	220	320
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 11.4 100	 15 150	 18 220	 24.6 320
Viscosity Index	ASTM D2270	100	100	98	98
Pour Point, °F (°C)	ASTM D97	0 (-18)	5 (-15)	10 (-12)	14 (-10)
Flash Point, °F (°C)	ASTM D92	469 (243)	480 (249)	495 (257)	500 (260)
API Gravity	ASTM D1298	29.3	28.5	28	27.4
Dielectric Strength, kV (min)	ASTM D877	N/A	N/A	N/A	N/A
Oxidation Life, Typical Hours	ASTM D943	4500	4500	4500	4500

D-A PART NUMBER

	32	46	68
Bulk	55091	55101	55111
Tote – 330 Gal	55093	55103	55113
Drum – 55 Gal	55092	55102	55112
Pail (Metal) – 5 Gal	55099	55109	55119
Pail (Plastic) – 5 Gal	55098	55108	55118

D-A PART NUMBER

	100	150	220	320
Bulk	55121	55131	55141	55211
Tote – 330 Gal	55123	55133	N/A	N/A
Drum – 55 Gal	55122	55132	55142	55212
Pail (Metal) – 5 Gal	55129	N/A	55149	N/A
Pail (Plastic) – 5 Gal	55128	55138	55148	55218

PresurFlo MV™

D-A **PresurFlo MV**™ hydraulic fluid is designed for all modern high-pressure hydraulic power systems used in construction equipment and stationary industrial installations. **PresurFlo MV**™ products are multi-viscosity anti-wear hydraulic fluids with optimum level of anti-wear additive for maximum protection against scuffing and wear in hydraulic pumps and motors. Extensive testing has shown these oils exhibit excellent resistance to foaming and oxidation and have excellent anti-rust properties. **PresurFlo MV**™ offers an expanded operating temperature range, a lower pour point, and a high viscosity index for improved cold temperature properties.

PRODUCT FEATURES AND BENEFITS

- Limits wear in low- and high-pressure vane pumps for longer pump life and reduced operating cost.
- Provides wear control for steel, brass and bronze pump parts when operating at maximum pressure ratings, resulting in excellent pump protection and more cost efficient operation.
- Can be used in both mobile and stationary hydraulic equipment, giving service flexibility and minimized inventory.
- Special rust and corrosion inhibitors limit rusting of ferrous metals and corrosion of yellow metals.
- Water separation/demulsibility helps protect equipment in wet service environments.
- Multi-Viscosity Hydraulic Fluid offers an expanded operating temperature range.

TYPICAL APPLICATIONS

Supports the performance requirements of:

AIST (U.S. Steel) 126, 127
ASTM D6158 HM
Axial Piston Pumps
Bosch Rexroth RD 90220
Bosch Variable Volume
Vacuum Pump
Cincinnati Machine
P-68 (ISO 32), P-69 (ISO 68)
P-70 (ISO 46)
Commercial Hydraulics
Construction Machinery
Denison HF-0, HF-1, HF-2
DIN 51524, parts 1, 2, 3
Eaton Brochure 03-401-2010
Eaton-Vickers I-286S, M-2950-S
General Motor LS-2
Hydraulic Power Systems
Hydraulic Drills
Industrial Gear Drives
ISO 11158 HM
JCMAS HK P041
MAG IAS
Rotary Air Compressors
SAE MS 1004
Sauer Danfoss SEB 18122
US Steel

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	32	46	68
SAE Viscosity Grade	Test Method	5W20	5W20	10W30
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 6.0 31.85	 7.6 44.92	 10.12 63.50
Viscosity Index	ASTM D2270	137	136	146
Pour Point, °F (°C)	ASTM D97	-40 (-40)	-36 (-38)	-33 (-36)
Flash Point, °F (°C)	ASTM D92	>428 (>220)	>428 (>220)	>439 (>226)
Dielectric Strength, kV (min)	ASTM D877	35	35	35
Oxidation Life, Typical Hours	ASTM D943	10,000	10,000	10,000

PresurFlo MV™ (cont'd)

D-A PART NUMBER

	32	46	68
Bulk	55151	55171	55161
Tote – 330 Gal	55153	55173	55163
Drum – 55 Gal	55152	55172	55162
Pail (Metal) – 5 Gal	55159	N/A	N/A
Pail (Plastic) – 5 Gal	55158	55178	55168

HEAVY DUTY

Reliant HD™ Nitrite-Free Antifreeze/Coolant

Reliant HD™ Nitrite-Free Antifreeze/Coolant is a premium quality Organic Acid Technology (OAT), ethylene glycol-based fluid. Specially formulated with advanced additive technology, this product provides extended service maintenance protection in heavy duty applications without the addition of SCAs, and meets nitrite-free coolant requirements of many industry-leading OEMs.

PRODUCT FEATURES AND BENEFITS

- Extended service life of 1,000,000 miles | 8 years or 20,000 hours of off-road use.*
- Free of phosphates, silicate, nitrites, amines, and borates.
- Offers excellent wet sleeve liner cavitation protection.
- Reduces maintenance with no SCAs required*.
- Provides maximum freeze and boil-over protection.
- Extended life corrosion protection for steel, solder, copper, iron, brass, and aluminum.
- High-quality defoamer system; Non-harmful to hoses, plastics, or gaskets.
- Compatible with all major American brands of coolant technologies including conventional and Organic Acid Technology (OAT).

**Recommended test interval is 300,000 miles/6,000 hours/1 year. Proper inhibitor can typically be achieved by topping off with Reliant HD Nitrite Free.*

Antifreeze/Coolant is poisonous; Clean up any leaks or spills immediately. Store away from children and animals. Do not store in open or unlabeled containers. When disposing of antifreeze/coolant, follow local laws and regulations. If required, dispose at facilities licensed to accept household hazardous waste, if permitted, dispose of in sanitary sewer systems. Do NOT discard into storm sewers, septic systems or onto the ground.

Meets or Exceeds These Performance Specifications:
ASTM D3306, ASTM D6210, Cummins CES 14603, GM 6277M (DEX-COOL®)**, JDS-G135, John Deere H24A, Navistar MPAPS B-1 Type IIIA, Perkins SEBU7833-03, TMC RP 329B
**DEX-COOL® is a registered trademark of the General Motors Corporation.

Works In/Suitable For:
CAT EC-1, Chrysler MS-7170, Case New Holland MAT 3620, Detroit Diesel 93K217, EMD 1748F, Ford ESE-M97B18-C, Ford ESE-M97B44-A, Komatsu KES 07892, MAN 324 Type SNF, Volvo 20774185

TYPICAL PROPERTIES

Reliant HD™ Nitrite-Free	50/50	Concentrate
Specific Gravity @ 68°F	1.082	1.131
pH	8.6	8.6
RA, mL	4.0	6.4
Base Fluid	Virgin Ethylene Glycol	Virgin Ethylene Glycol
Product Color	Yellow	Yellow
Bitterant	Yes	Yes
Freeze Point (of 50/50 solution by Volume)	-34°F (-36°C)	-34°F (-36°C)
Boil Point (of 50/50 solution by Volume)	226°F (108°C)	226°F (108°C)

Reserve alkalinity (RA) is a term used to indicate the amount of alkaline present in an antifreeze/coolant formulation. Advanced formulations contain new inhibitors which give added protection to certain metals but do not raise the RA number.

Reliant HD™ Nitrite-Free Antifreeze/Coolant (cont'd)

D-A PART NUMBER	50/50	CONCENTRATE
Bulk	88401	84421
Tote – 275 Gal	88407	88427
Drum – 55 Gal	88402	N/A

Reliant HD™ Extended Life Antifreeze/Coolant

Reliant HD™ Extended Life Antifreeze/Coolant is a premium quality Nitrite Organic Acid Technology (NOAT), ethylene glycol-based fluid. Specially formulated with industry-leading additives, this product provides extended service interval protection in heavy duty applications without the addition of SCAs.

PRODUCT FEATURES AND BENEFITS

- Extended service life of 1,000,000 miles on-road | 8 years or 20,000 hours of off-road use.*
- Offers excellent wet sleeve liner cavitation protection with a nitrite and molybdate additive combination.
- Reduces maintenance with no SCAs required*.
- Provides maximum freeze and boil-over protection.
- Free of phosphates, silicates, and amines.
- Extended life corrosion protection for steel, solder, copper, iron, brass, and aluminum.
- High-quality defoamer system; Non-harmful to hoses, plastics, or gaskets.
- Compatible with most major American brands of extended life Organic Acid Technology (OAT)-type Antifreeze/Coolant.

**HD Extender may be needed based on test results.*

Antifreeze/Coolant is poisonous; Clean up any leaks or spills immediately. Store away from children and animals. Do not store in open or unlabeled containers. When disposing of antifreeze/coolant, follow local laws and regulations. If required, dispose at facilities licensed to accept household hazardous waste, if permitted, dispose of in sanitary sewer systems. Do NOT discard into storm sewers, septic systems or onto the ground.

Meets or Exceeds These Performance Specifications:
ASTM D3306, ASTM D6210, John Deere H24A, Navistar MPAPS B-1 Type III, Perkins SEBU7833-03, TMC RP 329B

Works In/Suitable For:
CAT EC-1, Chrysler MS-7170, Case New Holland MAT 3620, EMD 1748F, Ford ESE-M97B18-C, Ford ESE-M97B44-A, Ford WSS-M97B51-A1, MAN 324 Type N, Volvo 20774185

TYPICAL PROPERTIES

Reliant HD™ Extended Life	50/50	Concentrate
Specific Gravity @ 68°F	1.072	1.122
pH	8.5	8.7
RA, mL	2.8	4.9
Base Fluid	Virgin Ethylene Glycol	Virgin Ethylene Glycol
Product Color	Red	Red
Bitterant	Yes	Yes
Freeze Point (of 50/50 solution by Volume)	-34°F (-36°C)	-34°F (-36°C)
Boil Point (of 50/50 solution by Volume)	226°F (108°C)	226°F (108°C)

Reserve alkalinity (RA) is a term used to indicate the amount of alkaline present in an antifreeze/coolant formulation. Advanced formulations contain new inhibitors which give added protection to certain metals but do not raise the RA number.

Reliant HD™ Extended Life Antifreeze/Coolant (cont'd)

D-A PART NUMBER

	50/50	Concentrate
Bulk	88381	N/A
Tote – 275 Gal	88387	N/A
Drum – 55 Gal	88382	88392
Case – 3/1 Gal	88384	N/A

Reliant HD™ Multi-Vehicle Antifreeze/Coolant

Reliant HD™ Multi-Vehicle Antifreeze/Coolant is a premium quality global Hybrid Organic Acid Technology (HOAT), ethylene glycol-based fluid. This product is specially formulated with industry-leading additives to provide optimum performance in gasoline engines, light duty diesel engines, and heavy-duty applications.

PRODUCT FEATURES AND BENEFITS

- User-friendly fluid color and product formulation allows for top-off of any fluid color and fluid consolidation.
- Can be used in automobiles and heavy-duty diesel engines.
- Contains a combination of nitrite and molybdate additives to provide superior wet sleeve liner cavitation protection.
- No initial SCA pre-charge required.
- Eliminates the need for SCAs at initial fill and when topping off.
- Phosphate-free with low silicates.
- Corrosion protection for steel, solder, copper, iron, brass, and aluminum.
- High-quality defoamer system; Non-harmful to hoses, plastics, or gaskets.
- Compatible with most conventional and extended life Organic Acid Technology (OAT)-type Antifreeze/Coolants.

Antifreeze/Coolant is poisonous; Clean up any leaks or spills immediately. Store away from children and animals. Do not store in open or unlabeled containers. When disposing of antifreeze/coolant, follow local laws and regulations. If required, dispose at facilities licensed to accept household hazardous waste, if permitted, dispose of in sanitary sewer systems. Do NOT discard into storm sewers, septic systems or onto the ground.

Meets or Exceeds These Performance Specifications:
ASTM D3306, ASTM D6210, John Deere H24A, Perkins SEBU7833-03, TMC RP 329B

Works In/Suitable For:
CAT EC-1, Chrysler MS-7170, Case New Holland MAT 3620, Cummins CES 14603, Detroit Diesel 93K217, EMD 1748F, Ford ESE-M97B18-C, Ford ESE-M97B44-A, Ford WSS-M97B51-A1, MAN 324 Type N, Navistar MPAPS B-1 Type III

TYPICAL PROPERTIES

Reliant HD™ Multi-Vehicle	50/50	Concentrate
Specific Gravity @ 68°F	1.072	1.119
pH	10.5	10.8
RA, mL	3.5	6.5
Base Fluid	Virgin Ethylene Glycol	Virgin Ethylene Glycol
Product Color	Yellow	Yellow
Bitterant	Yes	Yes
Freeze Point (of 50/50 solution by Volume)	-34°F (-36°C)	-34°F (-36°C)
Boil Point (of 50/50 solution by Volume)	226°F (108°C)	226°F (108°C)

Reserve alkalinity (RA) is a term used to indicate the amount of alkaline present in an antifreeze/coolant formulation. Advanced formulations contain new inhibitors which give added protection to certain metals but do not raise the RA number.

Reliant HD™ Multi-Vehicle Antifreeze/Coolant (cont'd)

D-A PART NUMBER

	50/50	Concentrate
Bulk	88321	N/A
Tote – 275 Gal	88327	N/A
Drum – 55 Gal	88322	88332
Case – 3/1 Gal	88324	N/A

Reliant HD™ Fully Formulated Antifreeze/Coolant

Reliant HD™ Fully Formulated Antifreeze/Coolant is a premium quality, conventional technology ethylene glycol-based fluid. This product is specially formulated with industry-leading additives to provide optimum performance in heavy-duty vehicles maintained with supplemental coolant additives (SCAs).

PRODUCT FEATURES AND BENEFITS

- Contains nitrites for superior wet sleeve liner cavitation protection.
- Provides maximum freeze and boil-over protection.
- Designed for heavy duty applications, yet can be used in automotive applications where conventional technology coolants are acceptable.
- Phosphate-free with low silicates.
- Effective, long-term corrosion protection for steel, solder, copper, iron, brass, and aluminum.
- High-quality defoamer system; Non-harmful to hoses, plastics, or gaskets.
- Compatible with all major American brands of conventional coolants, with or without the addition of SCAs.*
- Appropriate for use in on-and off-road diesel engines, as well as in stationary engine applications where a conventional pre-charged coolant is required.

*SCA levels will need maintaining throughout the life of the engine. Consult your vehicle's owner's manual for recommendations.

Antifreeze/Coolant is poisonous; Clean up any leaks or spills immediately. Store away from children and animals. Do not store in open or unlabeled containers. When disposing of antifreeze/coolant, follow local laws and regulations. If required, dispose at facilities licensed to accept household hazardous waste, if permitted, dispose of in sanitary sewer systems. Do NOT discard into storm sewers, septic systems or onto the ground.

Meets or Exceeds These Performance Specifications:
ASTM D3306, ASTM D6210, John Deere H24A, Navistar MPAPS B-1 Type II, Perkins SEBU7833-03, TMC RP 329B

Works In/Suitable For:
CAT EC-1, Chrysler MS-7170, Case New Holland MAT 3620, Cummins CES 14603, Detroit Diesel 93K217, EMD 1748F, Ford ESE-M97B18-C, Ford ESE-M97B44-A, MAN 324 Type N

TYPICAL PROPERTIES

Reliant HD™ Fully Formulated	50/50	Concentrate
Specific Gravity @ 68°F	1.075	1.125
pH	10.5	10.8
RA, mL	2.8	5.6
Base Fluid	Virgin Ethylene Glycol	Virgin Ethylene Glycol
Product Color	Fuschia or Green (88371)	Fuschia
Bitterant	Yes	Yes
Freeze Point (of 50/50 solution by Volume)	-34°F (-36°C)	-34°F (-36°C)
Boil Point (of 50/50 solution by Volume)	226°F (108°C)	226°F (108°C)

Reserve alkalinity (RA) is a term used to indicate the amount of alkaline present in an antifreeze/coolant formulation. Advanced formulations contain new inhibitors which give added protection to certain metals but do not raise the RA number.

Reliant HD™ Fully Formulated Antifreeze/Coolant (cont'd)

D-A PART NUMBER

	50/50	Concentrate
Bulk	88351(Fuschia), 88371(Green)	N/A
Tote – 275 Gal	88357	88367
Drum – 55 Gal	88352	88362
Case – 3/1 Gal	88354	N/A

PennGrade® Conventional Antifreeze/Coolant

PennGrade® Conventional Antifreeze/Coolant is a premium ethylene glycol-based fluid specially formulated with industry-leading additives to provide optimum performance in all gasoline, light and heavy-duty diesel engines*.

PRODUCT FEATURES AND BENEFITS
- Protects against corrosion of brass, copper, solder, steel, cast iron, and aluminum.
- Provides freeze and boil-over protection.
- Designed for use in passenger cars, light duty, and heavy-duty vehicles*.
- Ideal for conventional antifreeze applications.
- Phosphate-free with low silicates.
- High-quality defoamer system; Non-harmful to hoses, plastics, or gaskets.
- Compatible with most major American brands of conventional antifreeze/coolants.

*Conventional formulation can be used with the addition of SCA (Supplemental Coolant Additives) in heavy duty vehicles. Consult your vehicle's owner's manual for recommendations.

Antifreeze/Coolant is poisonous; Clean up any leaks or spills immediately. Store away from children and animals. Do not store in open or unlabeled containers. When disposing of antifreeze/coolant, follow local laws and regulations. If required, dispose at facilities licensed to accept household hazardous waste, if permitted, dispose of in sanitary sewer systems. Do NOT discard into storm sewers, septic systems or onto the ground.

Meets or Exceeds These Performance Specifications:
ASTM D3306, ASTM D4985, John Deere JDM H24C, Navistar MPAPS B-1 Type I

Works In/Suitable For:
Bombardier, BMW, Chrysler MS-7170, Case New Holland MAT 3620, Daimler DBL 7700.00, Daimler DBL 7700.10/.20, EMD MI 1748F, Ford ESE-M97B44-A, GM1825M, GM1899M, Wisconsin Motors

TYPICAL PROPERTIES

PennGrade® Conventional	50/50	Concentrate
Specific Gravity @ 68°F	1.072	1.119
pH	10.6	10.8
RA, mL	3.0	6.0
Base Fluid	Virgin Ethylene Glycol	Virgin Ethylene Glycol
Product Color	Green	Green
Bitterant	Yes	Yes
Freeze Point (of 50/50 solution by Volume)	-34°F (-36°C)	-34°F (-36°C)
Boil Point (of 50/50 solution by Volume)	226°F (108°C)	226°F (108°C)

Reserve alkalinity (RA) is a term used to indicate the amount of alkaline present in an antifreeze/coolant formulation. Advanced formulations contain new inhibitors which give added protection to certain metals but do not raise the RA number.

PennGrade® Conventional Antifreeze/Coolant (cont'd)

D-A PART NUMBER

	50/50	Concentrate
Bulk	88301	N/A
Tote – 275 Gal	88307	88317
Drum – 55 Gal	88302	88312
Case – 3/1 Gal	88304	N/A

Concrete Form Oil™

D-A **Concrete Form Oils**™ are non-residual, non-staining, VOC compliant* lubricants specifically designed to prevent concrete build-up on wood and metal forms used in concrete construction. These light colored oils form a non-drying oily surface which acts to seal and separate forms from the concrete, facilitating easy removal and eliminating bug holes. These form oils resist water wash-off and add rust protection to metal forms. Field performance has demonstrated that these form oils actually have a cleansing effect on previously existing concrete residues. D-A **Concrete Form Oils**™ are formulated with virgin base oils and specially selected additives to impart excellent parting characteristics to concrete forms. These form oils have low pour points and contain the proper level of free fatty acid. This fatty acid reacts with the base in the concrete to neutralize and form a soap, while the remaining triglycerides act as a slip agent for the form. This formulation works very well in allowing both a physical and chemical release, as well as increasing the life of the forms. This product is free of kerosene, diesel fuel, fuel oils, waxes and resins and may be applied with a roller, brush or sprayer. For best results, these form oils should be applied to a clean, dry surface.

D-A **Concrete Form Oils**™ are available in two viscosity grades: 65 SUS and 95 SUS. The 65 SUS form oil is well suited for year-round applications, whereas the 95 SUS form oil finds more use in warmer weather applications.

*VOC regulations vary with individual State requirements.
D-A **Concrete Form Oils**™ VOC data are provided in Typical Properties Table.

TYPICAL PROPERTIES

SUS Viscosity Grade	Test Method	65	95
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 2.8 10.7	 4.2 22
Viscosity Index	ASTM D2270	102	105
Pour Point,	ASTM D97	-25 (-30)	-20 (-27)
Flash Point, °F (°C)	ASTM D92	325 (163)	350 (176)
API Gravity	ASTM D4052	35.2	33
Density, lbs/gal (g/L)	Calculated	7.08 (849)	7.08 (860)
Color	ASTM D1500	0.5	1
VOC, g/L	EPA Method 24	103	66

D-A PART NUMBER

	65	**95**
Bulk	55271	55281
Tote – 330 Gal	55273	55283
Drum – 55 Gal	55272	55282
Pail – 5 Gal	N/A	55288

D-A Cross Transformer Oil™

D-A **Cross Transformer Oil**™ is a specially processed, inhibited, naphthenic transformer oil that meets ASTM D3487 transformer oil requirements.

It contains no harmful polychlorinated biphenyls (PCB's) or corrosive sulfur. Its low moisture content ensures high electrical resistance, and both thermal and oxidative stability. D-A **Cross Transformer Oil**™ is highly stable and not corrosive to copper. Its low pour point and low viscosity provides excellent heat transfer under all temperature conditions. The high flash point provides for a margin of safety.

PRODUCT FEATURES AND BENEFITS

- Prolonged transformer life – excellent heat transfer properties improve cooling of transformer components.
- Maximized life of oil immersed switches – rapid quenching of arcs reduces contact erosion.
- Transformer efficiency – high dielectric strength and low dissipation factor provides excellent insulating characteristics.
- Extended service life – oxidation stability of D-A **Cross Transformer Oil**™ limits the formulation of sludge, deposits and soluble compounds which break down the electrical properties of the oil in extended service conditions.

TYPICAL APPLICATIONS

D-A **Cross Transformer Oil**™ is recommended for use in arc-forming apparatus including:
Oil immersed transformers
Switches
Circuit breakers
Oil-filled capacitors
Tap changers
Electrical enclosures
Fuses

D-A **Cross Transformer Oil**™ complies fully with the following specifications:
ASTM D3487, Type II
Doble TOPS-884, Inhibited Type II
BS 148:1984, Class IIA (Inhibited)
IEC 296:1982, Class IIA (Inhibited)
CAN/CSA-C50-97, Type II (Class B)

TYPICAL PROPERTIES

D-A Cross Transformer Oil™	Test Method	
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 2.34 9.54
Pour Point °F (°C)	ASTM D97	-65.2 (-54)
Flash Point, °F (°C)	ASTM D92	302 (150)
Specific Gravity @ 15°C/60°F	ASTM D1298	0.894
Dielectric Breakdown Voltage 60Hz: Disc electrodes, KV	ASTM D877	50
Power Factor @ 60Hz, % max @ 100°C	ASTM D924	0.05
PCB Content, ppm	ASTM D4059	None Detected

D-A PART NUMBER

Drum – 55 Gal 57012

Bar and Chain Oil

All Season D-A **Bar and Chain Oil** is formulated to insure good performance on all link chain and chain bars including chain saw bars. Premium quality D-A **Bar and Chain Oil** extends the life of the bar, chain and sprocket by protecting against wear. It is formulated with high levels of tackifier additive to resist dripping and throw-off. D-A **Bar and Chain Oil** prevents rusting and reduces friction and heat build-up on cutting chain and guide bar. Anti-wear agents reduce metal-to-metal contact wear between the drive sprocket, the bar guide and the moving chain.

D-A **Bar and Chain Oil** is recommended for all makes of chain saws and all types of link chains that require lubrication - including motorcycles and bicycles as well as farm and industrial uses.

PRODUCT FEATURES AND BENEFITS
- Extends bar, chain and sprocket life
- Tackifier stays on the bar and chain
- Easy pour
- Resists “throw-off”
- Quality oil and tackifier prevent moisture from oxidizing bar and chain
- Prevents rusting
- Reduces friction and wear
- Easy to use

TYPICAL APPLICATIONS
D-A **Bar and Chain Oil** is recommended for all makes of chain saws and all types of link chains that require lubrication, including motorcycles, and bicycles, as well as farm and industrial uses.

TYPICAL PROPERTIES

Bar and Chain Oil	Test Method	100	150	220
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 12.0 97.7	 15.7 148.4	 19.9 217.4
Viscosity Index	ASTM D2270	114	109	105
Pour Point, °F (°C)	ASTM D97	-29 (-34)	-17 (-27)	-9 (-23)
Flash Point, °F (°C)	ASTM D92	445 (229)	455 (235)	460 (238)
API Gravity	ASTM D4052	30.6	29.6	28.7

D-A PART NUMBER

	100	**150**	**220**
Bulk	59101	59111	59121
Tote - 330 Gal	59103	59113	59123
Drum – 55 Gal	59102	N/A	N/A
Case – 4/1 Gal	59105	N/A	N/A

No Rust Journal Bearing Oil

D-A **No Rust Journal Bearing Oil** is a high quality, low pour point lubricating oil designed specifically for use in railroad car journal boxes utilizing plain bearings. It is formulated with premium paraffinic base oils and a balanced heavy-duty additive system that provides superior performance over a wide range of service conditions.

The term “journal” in conventional machine design applies to that part of the shaft which revolves and is supported by the bearing. The “journal bearing,” is the cylinder which surrounds the shaft and provides a frictionless hydrodynamic barrier to support and guide the rotating shaft.

PRODUCT FEATURES AND BENEFITS
D-A **No Rust Journal Bearing Oil** is a multi-viscosity rust inhibited lubricating oil that provides exceptional lubrication during start-up, as well as the proper viscosity and film strength required under various operational speeds. This product incorporates a pour point depressant to ensure an adequate supply of oil to the journal over a wide range of operating temperatures. It is further enhanced with a highly effective additive system that controls deposits and provides outstanding rust and corrosion protection.

Additionally, this product provides:
- Excellent fluidity
- Good shear stability
- Good water separability
- Outstanding resistance to foaming

D-A **No Rust Journal Bearing Oil** is designed for the lubrication of railcar and locomotive journal bearings and conforms to the stringent requirements of the Association of American Railroads (AAR) Specification M-963-84 Standard for “All-Year Journal Box Lubricating Oil.” Meets the EMD & GE Ashless requirements. It is recommended for use in saturating lubricating devices, plain journal bearing waste saturation, pad lubrication and free oiling of journal boxes. Always follow the manufacturer’s recommendations regarding equipment and lubricant maintenance.

No Rust Journal Bearing Oil (cont'd)

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	68
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 8.7 65
Viscosity Index	ASTM D2270	106
Pour Point, °F (°C)	ASTM D97	-38 (-39)
Flash Point, °F (°C)	ASTM D92	453 (234)
API Gravity	ASTM D4052	29.5

D-A PART NUMBER

Tote	73053
Drum – 55 Gal	73052

Brad Penn® Security Non Detergent Motor Oil

D-A **Brad Penn® Security Non Detergent Motor Oil** is a SAE 30 uninhibited oil formulated with high quality base stocks and anti-foam to minimize cavitation. The base stock is refined from PennGrade® base oil, which is a unique, thermally stable paraffinic crude that is free of asphalt constituents, has a naturally high viscosity index, and contains only trace amounts of sulfur and nitrogen. PennGrade® base oil offers naturally good anti-wear characteristics making this oil suitable for use in certain hydraulic applications where an ISO viscosity grade (VG) 100 fluid is warranted, straight cut reduction gear applications where bearing protection is crucial, and other applications requiring an API Service SA fluid. Category SA denotes service typical of older engines operated under such mild conditions that the protection afforded by compounded oils is not required. This category has no performance requirements, and oils in this category should not be used in any engine unless specifically recommended by the equipment manufacturer.

TYPICAL PROPERTIES

SAE Viscosity Grade	J300	30
API Service		SA
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 11.3 100
Viscosity Index	ASTM D2270	95
Pour Point °F (°C)	ASTM D97	0 (-18)
Flash Point, °F (°C)	ASTM D92	460 (238)
API Gravity	ASTM D4052	29.5

D-A PART NUMBER

Case – 12/1 Qt 70306

Circulating Oil GR II™

D-A **Circulating Oil GR II**™ is a premium quality circulating oil available in ISO viscosity grade 460. It is designed to be environmentally friendly. D-A **Circulating Oil GR II**™ is zinc and phenol free. The highest quality petroleum base oil is selected for its natural stability and for its compatibility with high performance components. Exceptional rust and oxidation resistance are results of the unique formulation of select base oil and additives. Anti-wear performance is achieved by the basic formulation which is of a non-corrosive nature.

D-A **Circulating Oil GR II**™ supports the performance requirements of lubricants used in *Morgoil® Bearings. These high quality oils meet Morgoil® Advanced Lubricant (Super Demulsibility) specification (Rev. 2.4 dated Feb. 29, 2007).

PRODUCT FEATURES AND BENEFITS
- Resistance to oxidation and the formation of deposits.
- Fast separation from water protects bearings from water damage.
- Protection against rust and corrosion provides longer bearing life.
- Compatibility with seal material provides excellent seal life.
- Environmentally favorable (no zinc, phenol) - allows for use in environmentally sensitive areas.

TYPICAL APPLICATIONS
D-A **Circulating Oil GR II**™ supports the performance requirements of lubricants used in Morgoil® Bearings. These high quality oils meet Morgoil® Advanced Lubricant (Super Demulsibility) specification (Rev. 2.4 dated Feb. 29, 2007). Use generally in any lubricating oil circulation system that is well-engineered and protected from leakage or contamination which would require frequent oil replacement. Designed for lubrication of bearings, gears and ways.

*Morgoil® is a registered trademark of Morgan Co.

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	460
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 34.2 460
Viscosity Index	ASTM D2270	110
Pour Point, °F (°C)	ASTM D97	10 (-12)
Flash Point, COC, °F (°C)	ASTM D92	588 (292)
API Gravity	ASTM D4052	27.5
Copper Strip Corrosion	ASTM D130	1a
Rust Test	ASTM D665	Pass
Foam Test	ASTM D892	Pass

D-A PART NUMBER

Bulk	57281
Tote – 330 Gal	57283

Torque Fluid II™

D-A **Torque Fluid II**™ is a unique high-performance lubricant specifically designed for superior lubrication of heavy duty automatic and powershift transmissions requiring an Allison C-4 fluid.

D-A **Torque Fluid II**™ is engineered to control friction which minimizes clutch plate slippage, wear and helps reduce glazing. It limits wear and protects against oxidation, sludge and varnish formation. This fluid is also widely utilized in rotary screw air compressors.

PRODUCT FEATURES AND BENEFITS

- Seal and elastomer compatibility keeps fluid in, and dirt and water out.
- High detergency and dispersancy control sludge and varnish deposits to maintain a clean, efficient transmission.
- Superior resistance to fluid oxidation and thermal deterioration, provide longer fluid service life with less oil thickening and fewer transmission deposits.
- Controlled frictional properties minimize clutch plate slippage and wear reducing operating costs through efficient power transfer.
- Special anti-wear additives limit wear and loss of transmission power transfer capacity reducing maintenance expenses.
- Compatibility with diesel engine oil prevents potential damage resulting if fluid is accidentally mixed with engine oil in crankcase or transmission.

TYPICAL APPLICATIONS

Transmissions/Torque Converters
- Allison Automatics
- Allison Powershifts C-3, C-4
- Caterpillar TO-2 (not TO-4)
- Sundstrand Hydrostatics

Rotary Air Compressors
- Vane
- Screw
- High Temperature
- High Speed

Hydraulic Systems and Pumps
- Vane
- Axial Piston — Some Gear

TYPICAL PROPERTIES

SAE Viscosity Grade	Test Method	10W
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 6.4 41.8
Viscosity Index	ASTM D2270	100
Pour Point, °F (°C)	ASTM D96	-35 (-37)
Flash Point, °F (°C)	ASTM D92	410 (210)
API Gravity	ASTM D4052	28.8
Copper Strip Corrosion	ASTM D130	Pass
Rust Test	ASTM D665	Pass
Foam Test	ASTM D892	Pass

D-A PART NUMBER

Bulk	53511
Tote – 330 Gal	53513
Drum – 55 Gal	53512
Pail (Plastic) – 5 Gal	53518

WearGuard™ SYN 3000 Series

WearGuard™ SYN 3000 Series is a premium Group III full synthetic fluid formulated with **ChemGuard™** additive technology system. It is designed to exceed the demanding lubrication requirements of oil flooded rotary vane, screw and reciprocating type compressors. **WearGuard™ SYN 3000 Series** conforms to ISO viscosity classifications 32, 46, 68, 100 and 150. It is formulated from severely hydro-treated, hydro-cracked hydrocarbon base stocks combined with the latest developments in additive technology. This combination makes **WearGuard™ SYN 3000 Series** excellent for oxidation and thermal degradation resistance - providing the potential for extended drain intervals, fewer air filter changes and less oil carryover.

PRODUCT FEATURES AND BENEFITS

- Low temperature fluidity
- Exceptional oxidation stability
- Excellent anti-friction and anti-wear properties
- D-A synthetic base oil combination is compatible with seals and elastomers commonly found in compressed air systems
- Excellent demulsibility protects against rust and corrosion

TYPICAL APPLICATIONS

Oil Flooded Rotary Vane Compressors
Oil Flooded Screw Type Compressors
Air Compressors where the lubricant is injected directly into the airstream
Reciprocating (Piston-Type) Compressors (ISO 100 grade)
Vacuum Pumps

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	32	46	68	100	150
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 5.8 32.8	 7.8 45.6	 10.0 67.9	 14.1 101.2	 17.9 152.4
Viscosity Index	ASTM D2270	127	126	131	142	130
Pour Point, °F (°C)	ASTM D97	-29 (-34)	-20 (-29)	-11 (-24)	-11 (-24)	-42 (-41)
Flash Point, °F (°C)	ASTM D92	446 (230)	478 (248)	482 (250)	486 (252)	430 (221)
API Gravity	ASTM D4052	35.6	34.8	34.5	34.2	29.7
FZG Test, Pass Stage	ASTM D5182	12	12	12	12	12
Copper Strip Corrosion	ASTM D130	1b	1b	1b	1b	1b
Foam Test	ASTM D892	Pass	Pass	Pass	Pass	Pass

D-A PART NUMBER

	32	46	68	100	150
Bulk	IP53711	IP53721	IP53731	IP53741	N/A
Tote – 330 Gal	IP53713	IP53723	N/A	IP53743	IP53753
Drum – 55 Gal	IP53712	IP53722	IP53732	IP53742	IP53752
Pail (Plastic) – 5 Gal	IP53718	IP53728	IP53738	IP53748	N/A

WearGuard™ SYN 8000i Series

WearGuard™ SYN 8000i Series are fully synthetic lubricants formulated with superior polyalkylene glycol (PAG)-based oils. These premium lubricants are designed for use in compressors and vacuum pumps compressing polar gases, such as NH3, CO2, and propane. They are blended with D-A's advanced **ChemGuard™** additive technology and offer excellent oxidation resistance and are excellent in wet gas compression.

The **WearGuard™ SYN 8000i Series** yields a compressor service life of 8,000 – 10,000 hours under good operating conditions. This product is also recommended for Rotary Screw, Rotary Vane, Centrifugal, and Reciprocating Compressors including Vacuum Pump operations.

PRODUCT FEATURES AND BENEFITS

- Resists hydrocarbon washout/dilution
- Insoluble
- Extended drain life
- Reduced sludge and deposit formulation
- Excellent oxidative and thermal stability

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	100	150	220
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 18.9 106	 25.7 154	 34.5 220
Viscosity Index	ASTM D2270	195	195	205
Pour Point, °F (°C)	ASTM D97	-40 (-40)	-36 (-38)	-36 (-38)
Flash Point, °F (°C)	ASTM D92	445 (230)	445 (230)	445 (230)
API Gravity	ASTM D4052	11.4	11.4	11.4
FZG Test, Pass Stage	ASTM D5182	11	12	N/A

D-A PART NUMBER

	100	150	220
Bulk	N/A	N/A	N/A
Drum – 55 Gal	IP53842	N/A	IP53862
Pail (Plastic) – 5 Gal	IP53848	IP53858	N/A

WearGuard™ SYN Compressor Flush

WearGuard™ SYN Compressor Flush is a premium quality synthetic fluid designed to dissolve varnish and solubilize sludge from rotary-screw air compressors during operation. It can also be used as a system flush when changing-over from mineral to synthetic oils in order to reduce contamination due to oil carry-over. Regular use of **WearGuard™ SYN Compressor Flush** will help you get the most out of your synthetic oil and your compressor by removing varnish and reducing operating temperature.

PRODUCT FEATURES AND BENEFITS

- 100% Synthetic Lubricant
- Solubilizes and removes harmful varnish and sludge
- Contains additives – can be used as a lubricant for up to 500 hours
- Contains no aromatic solvents or hazardous chemicals
- Compatible with mineral oils as well as synthetic oils
- USDA H-2 authorized
- High flash point
- May adversely affect some paint finishes, plastics and seals

TYPICAL APPLICATIONS

Rotary Screw Compressors
Rotary Vane Compressors
Centrifugal Compressors

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	32
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 6.5 37.1
Viscosity Index	ASTM D2270	126
Pour Point, °F (°C)	ASTM D97	-49 (-45)
Flash Point, °F (°C)	ASTM D92	400 (204)
API Gravity	ASTM D4052	19
Copper Strip Corrosion	ASTM D130	1b

D-A PART NUMBER

Bulk	IP72511
Tote – 330 Gal	IP72513
Pail (Plastic) – 5 Gal	IP72518

WearGuard™ SYN 2000 Series

WearGuard™ SYN 2000 Series is specially formulated with **ChemGuard™** PAO additive technology system. Under normal operating conditions you can expect extended drain cycles and experience 6,000 to 8,000 hours of use in rotary screw and rotary vane compressors.

WearGuard™ SYN 2000 Series is based on a very thermally and oxidatively stable PAO (polyalphaolefin) base oil for use in a wide variety of air compressors. **WearGuard™ SYN 2000 Series** is used where maximum seal, paint, plastic, and rubber compatibility is required. **WearGuard™ SYN 2000 Series** is formulated to resist varnish under high temperature applications and minimize impact from airborne contaminants.

PRODUCT FEATURES AND BENEFITS
- Outstanding thermal and oxidative stability
- Compatible with most seals, plastics, rubbers
- Wide operating temperature range
- Non-detergent
- Anti-wear protection
- Compatible with most compressor oils
- High flash point means increased safety
- Extended drain intervals

TYPICAL APPLICATIONS
Rotary Screw
Reciprocating
Rotary Vane
Vacuum Pumps

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	46	68	100	150
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 7.5 46	 9.5 68	 14.5 100	 18.3 150
Viscosity Index	ASTM D2270	128	135	150	131
Pour Point, °F (°C)	ASTM D97	-60 (-51)	-55 (-48)	-50 (-45)	-50 (-45)
Flash Point, °F (°C)	ASTM D92	465 (244)	465 (241)	475 (246)	500 (260)
API Gravity	ASTM D4052	33.0	33.0	33.0	33.0
Copper Strip Corrosion	ASTM D130	1b	1b	1b	1b
Foam Test	ASTM D892	Pass	Pass	Pass	Pass

D-A PART NUMBER

	46	68	100	150
Bulk	IP72621	IP72631	IP72641	IP72651
Tote – 330 Gal	IP72623	N/A	IP72643	IP72653
Drum – 55 Gal	N/A	IP72632	IP72642	IP72652
Pail (Plastic) – 5 Gal	IP72628	N/A	IP72648	IP72658

WearGuard™ SYN 7000 Series

WearGuard™ SYN 7000 Series is formulated with **ChemGuard™** additive technology. Unlike many other rotary screw synthetic compressor oils, these lubricants have been developed from a unique blend of polyglycol and pentaerythritol esters, which together form an exceptional coolant and act to reduce oxidation and deposit formation. **WearGuard™ SYN 7000 Series** offers excellent heat transfer properties, long life, high flash points, low evaporation, low volatility, and excellent hydrolytic stability, and will not form varnish deposits like petroleum or PAO oils.

PRODUCT FEATURES AND BENEFITS

- Fully 100% synthetic
- Polyglycol/Pentaerythritol ester blend
- Wide temperature range
- Extended oil change intervals
- Eliminates deposit formation
- High flash points mean reduced fire hazards
- Waste disposal is minimized due to longer life
- Cost effective
- Eliminates seasonal oil changes

TYPICAL APPLICATIONS

Rotary Screw
Reciprocating
Rotary Vane

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	32	46
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 8.3 40	 9.0 48
Viscosity Index	ASTM D2270	188	170
Pour Point, °F (°C)	ASTM D97	-55 (-48)	-50 (-45)
Flash Point, °F (°C)	ASTM D92	690 (366)	490 (254)
API Gravity	ASTM D4052	11.4	12.9
Foam Test	ASTM D892	Pass	Pass

D-A PART NUMBER	32	46
Drum – 55 Gal	N/A	IP73222
Pail (Plastic) - 5 Gal	IP73218	IP73228

WearGuard™ SYN HVI Compressor Oil 32/46

WearGuard™ SYN HVI Compressor Oil 32/46 is made from a severely hydro-treated, hydro-cracked hydrocarbon base fluid and designed especially for portable compressor applications. **WearGuard™ SYN HVI Compressor Oil 32/46** has been formulated with excellent anti-wear and high film strength properties to provide the superior lubricating performance required for the severe service conditions in the portable compressor industry. This lubricant is designed to extend portable compressor life well beyond the standard motor oils and hydraulic fluids typically used in this service.

PRODUCT FEATURES AND BENEFITS
- Superior lubricating film strength
- Compatible with all seal materials
- Excellent rust & oxidation protection
- Superior wear protection
- Excellent low temperature performance
- Reduced foaming & fluid loss in severe service conditions
- Cleaner running operation, more resistant to varnish

TYPICAL APPLICATIONS
- Rotary Screw Compressors

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	32/46
Viscosity @ 100°C, cSt @ 40°C, cSt	ASTM D445 ASTM D445	7.82 38
Viscosity Index	ASTM D2270	183
Pour Point, °F (°C)	ASTM D97	-47 (-44)
Flash Point, °F (°C)	ASTM D92	439 (226)
API Gravity	ASTM D4052	34.9

D-A PART NUMBER
Pail (Plastic) – 5 Gal IP74318

WearGuard™ FQH WO Series

WearGuard™ FQH WO Series are food grade hydraulic fluids that are formulated with USP grade white oils. These NSF registered food grade hydraulic fluids are engineered to meet the demanding requirements of severe service hydraulic systems using high pressure, high temperature and high output pumps.

PRODUCT FEATURES AND BENEFITS

- Anti-wear protection for high-pressure systems
- Recommended for gear, vane and piston pumps
- Rust, oxidation and foam inhibited
- Designed for extreme-temperature operations
- Hydrolytically stable and readily separates from water
- Excellent compatibility with elastomers, seals, plastics, and paints
- Protects lubricants from microbial degradation
- Complies with FDA 21 CFR 178.3570 H-1

TYPICAL APPLICATIONS

Hydraulic Systems
Hydraulic Systems containing gears and bearings
Gears
Bearings
Compressors
Vacuum pumps
Slide Ways & Chains
Wipe Down Oil
Air Lines
Meat Processing Plants
Poultry Processing Plants
Food Processing (H-1)

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	32
Viscosity @ 40°C, cSt @ 100°C, cSt	 ASTM D445 ASTM D445	 31.1 5.3
Viscosity Index	ASTM D2270	102
Pour Point, °F (°C)	ASTM D97	-11 (-24)
Flash Point, °F (°C)	ASTM D92	400 (204)
API Gravity	ASTM D4052	34
Rust Test	ASTM D665	Pass
Foam Test	ASTM D892	Pass
NSF Registration No./Category Code		154605/H1

D-A PART NUMBER

Pail (Plastic) – 5 Gal IP71818

Heat Transfer Oil No. 300™

D-A **Heat Transfer Oil No. 300**™ may be used in most major asphalt heaters and other types of heat transfer systems requiring a mineral oil as a medium for storing and transferring heat. It possesses excellent natural temperature stability when subjected to the high temperatures encountered in most heater systems. It is not unusual for some heat transfer systems to operate at an oil temperature in excess of 400°F, which means that the heater tube walls themselves can be considerably hotter. The most important criteria of a heat transfer oil is temperature stability.

D-A **Heat Transfer Oil No. 300**™ provides the required temperature stability with a minimum of coking, which is the reduction of a petroleum product to carbon in an atmosphere devoid of oxygen. D-A's research indicates that the tendency of an oil to coke is dependent on the methods used to refine the base oil. D-A **Heat Transfer Oil No. 300**™ is produced from a carefully selected base oil that has been refined in such a manner as to provide maximum natural temperature stability and reduced coking.

PRODUCT FEATURES AND BENEFITS

- Meets and exceeds the heater oil requirements established by the manufacturers of asphalt heaters, ideal for use in any heat application.
- Contains extremely effective oxidation inhibitors for longer oil life and minimum coking.
- Performance-proven temperature stability means the oil won't break down under severe heat stress.
- Compounded with high quality stable base stocks fortified with oxidation inhibitor and ashless detergent-dispersant to
- effectively reduce the deposit of carbon (coking) on heater tubes.
- Choice base oils and additives give the oil exceptionally low carbon forming tendencies for minimum tube coking.

TYPICAL APPLICATIONS

High temperature heat transfer systems
Asphalt heaters
Any system using mineral oil as a medium for storing and transferring heat

TYPICAL PROPERTIES

Heat Transfer Oil No. 300™	Test Method	
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 7.35 53.7
Viscosity Index	ASTM D2270	96
Flash Point, °F (°C)	ASTM D92	455 (235)
Fire Point, °F (°C)	ASTM D92	520 (271)
API Gravity	ASTM D287	30.6
Carbon Residue of Blend		0.028%

D-A PART NUMBER

Bulk	58001
Tote – 330 Gal	58003
Drum – 55 Gal	58002
Pail (Plastic) – 5 Gal	58008

HTCF Oil™

D-A **HTCF Oil**™ (Heat Transfer Cleaning and Flushing Oil) is a specially formulated, acid-free product for annual or semi-annual cleaning and flushing of the heating core that cokes up causing inefficient operation of asphalt heating machinery. It possesses excellent natural temperature stability when subjected to the high temperatures encountered in most heater systems.

D-A **HTCF Oil**™ provides the required temperature stability and will completely clean and strip the built-up coke without damaging the heating element like some acid products can. Afterwards, the **HTCF Oil**™ flushed from the system can be used to fuel a gas heater, so there are no waste or EPA issues. After flushing the system, we recommend using D-A **Heat Transfer Oil No. 300**™ in the heater to minimize future problems with coking.

D-A **HTCF Oil**™ can also be used at a lower treat level and left in the oil circulation system.

After the system has been cleaned with **HTCF Oil**™, the drained product is non-hazardous, unlike acid products and can be burned in shop heaters.

PRODUCT FEATURES AND BENEFITS

- Meets and exceeds the heater oil requirements established by the manufacturers of asphalt heaters, ideal for use in any heat application.
- Contains aggressive coke cutting additives to clean and strip the system of clogging coke build-up.
- Performance-proven temperature stability means the oil won't break down under severe heat stress.
- Non-acid formula will not damage heating equipment.
- High flash point and fire point means **HTCF Oil**™ can work safely in oxygen free environments.

TYPICAL APPLICATIONS

High temperature heat transfer systems.
Asphalt heaters.
Any system using mineral oil as a medium for storing and transferring heat where coking and tube build-up have caused problems.

TYPICAL PROPERTIES

Heat Transfer Cleaning and Flushing Oil	Test Method	
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 14.8 109.5
Viscosity Index	ASTM D2270	140
Flash Point, °F (°C)	ASTM D92	425 (218)
Fire Point, °F (°C)	ASTM D92	460 (238)
API Gravity	ASTM D287	27.5

D-A PART NUMBER

Bulk	58011
Tote – 330 Gal	58013
Drum – 55 Gal	58012

Heat Transfer Oil 22™

D-A **Heat Transfer Oil 22**™ may be used in all major asphalt heaters and other types of heat transfer systems requiring a highly stable oil as a medium for storing and transferring heat. It possesses excellent natural temperature stability when subjected to the high temperatures encountered in most heater systems. It is not unusual for some heat transfer systems to operate at an oil temperature in excess of 400°F, which means that the heater tube walls themselves can be considerably hotter. The most important criteria of a heat transfer oil is temperature stability.

D-A **Heat Transfer Oil 22**™ provides the required temperature stability with a minimum of coking, which is the reduction of a petroleum product to carbon in an atmosphere devoid of oxygen. D-A's research indicates that the tendency of an oil to coke is dependent on the methods used to refine the base oil.

D-A **Heat Transfer Oil 22**™ is produced from a carefully selected base oil that has been refined in such a manner as to provide maximum natural temperature stability.

PRODUCT FEATURES AND BENEFITS

- Supports the heating oil performance requirements established by the manufacturers of asphalt heaters, ideal for use in any heat application.
- Contains extremely effective oxidation inhibitors for longer oil life and minimum coking. Performance-proven temperature stability means the oil won't break down under severe heat stress.
- Compounded with high quality stable base stocks fortified with additives designed to effectively reduce the deposit of carbon (coking) on heater tubes, resulting in minimal tube fouling.

TYPICAL APPLICATIONS

High temperature heat transfer systems
Residual fuel heating systems
Asphalt heaters
Any system using mineral oil as a medium for storing and transferring heat

TYPICAL PROPERTIES

Heat Transfer Oil No. 22™	Test Method	22
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 4.35 22
Viscosity Index	ASTM D2270	105
Flash Point, COC, °F (°C)	ASTM D92	374 (190)
API Gravity	ASTM D4052	31.6
Maximum System Temperature Closed System, °F (°C) Open System, °F (°C)		 550 (288) 340 (171)

D-A PART NUMBER

Bulk	58041
Drum – 55 Gal	58042

Custom Blend Heat Transfer Fluid

D-A **Custom Blend Heat Transfer Oil** may be used in most major asphalt heaters and other types of heat transfer systems requiring a mineral oil as a medium for storing and transferring heat. It possesses excellent natural temperature stability when subjected to the temperatures encountered in most heater systems. It is not unusual for some heat transfer systems to operate at an oil temperature in excess of 400°F, which means that the heater tube walls themselves can be considerably hotter. The most important criteria of a heat transfer oil is temperature stability.

D-A **Custom Blend Heat Transfer Oil** provides the required temperature stability with a minimum of coking, which is the reduction of a petroleum product to carbon in an atmosphere devoid of oxygen. D-A's research indicates that the tendency of an oil to coke is dependent on the methods used to refine the base oil. D-A Custom Blend Heat Transfer Oil is produced from a carefully selected base oil that has been refined in such a manner as to provide maximum natural temperature stability and reduced coking.

PRODUCT FEATURES AND BENEFITS

- Meets and exceeds the heater oil requirements established by the manufacturers of asphalt heaters, ideal for use in any heat applications
- Contains extremely effective oxidation inhibitors for longer life and minimum coking.
- Performance proven temperature stability means the oil won't break down under severe heat stress.
- Compounded with high quality stable base stocks fortified with oxidation inhibitors and ashless detergent – dispersant to effectively retard the deposit of carbon (coking) on heater tubes.
- Choice base oils and additives give the oil exceptionally low carbon forming tendencies for minimum tube coking.

TYPICAL APPLICATIONS

High temperature heat transfer systems; Asphalt Heaters
Any system using mineral oil as a medium for storing and transferring heat

TYPICAL PROPERTIES

Custom Blend Heat Transfer Fluid	Test Method	
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 9.2 69
Viscosity Index	ASTM D2270	110
Flash Point, °F (°C)	ASTM D92	450 (232)
Fire Point, °F (°C)	ASTM D92	520 (271)
API Gravity	ASTM D287	29

D-A PART NUMBER

Bulk	58051
Tote – 330 Gal	58053
Drum – 55 Gal	58052

WearGuard™ MWF

WearGuard™ MWF (Metal Working Fluid) is an optimized multi-purpose inactive cutting oil without the harmful presence of chlorinated compounds. This lubricant begins with high viscosity index premium base oils for its natural temperature shear stability, low pour point and superior protective metal to tool boundary characteristics.

D-A **ChemGuard**™ innovative additive formula has a vigorous EP/anti-wear inhibitor that reduces friction to minimize potential welding, galling or scoring and rust and corrosion protection for high load carrying capabilities. It also has a foam inhibitor and a low-odor mist suppressant that allows transparent work for improved visual examination during cutting.

D-A **ChemGuard**™ innovative additive formula effectively manages undesirable build up on the tool tip and extends tool life. The result produces less stress on the machine while increasing efficiency and significantly improves the finish on the cutting surface.

WearGuard™ MWF works well in high temperature applications and flows easily in low temperature work environments. This product is highly recommended for use where higher turning speeds, faster feed and higher loads are present.

PRODUCT FEATURES AND BENEFITS
- Elimination of chlorinated compounds
- Waste disposal cost reduction
- Multi-purpose/inventory reduction
- Improved corrosion resistance
- Higher speeds and feed rates
- Improved tool life
- Improved surface finish

TYPICAL APPLICATIONS
Ferrous Materials with Machinability Ratings over 70%: Tapping, Threading, Gear Generation & Hobbing, Drilling (Deephole), Reaming, Milling and Turning.
Non-Ferrous Materials, Copper, Brass, Bronze/Nickel, Aluminum: Gear Generation & Hobbing.

TYPICAL PROPERTIES

WearGuard™ D-A MWF	Test Method	
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 5.0 24.9
Viscosity Index	ASTM D2270	122
Pour Point, °F (°C)	ASTM D97	5 (-15)
Flash Point, °F (°C)	ASTM D92	395 (205)
Color	ASTM D1500	L 7.0
Sulfur, Total %		0.62
Sulfur, Active %	ASTM D1662	0.00
Chlorine %		0.00
Antimist		Yes
Antifoam		Yes

WearGuard™ MWF (cont'd)

D-A PART NUMBER	
Bulk	IP73001
Tote – 330 Gal	IP73003
Drum – 55 Gal	IP73002

Fast Quench 70™

D-A **Fast Quench 70**™ is a fast-speed quenching oil formulated to optimize heat resistance using paraffinic base oils and unique resins. Sludge forming tendencies are reduced to a minimum and the quench oil's ability to continuously produce bright finish parts is enhanced. D-A **Fast Quench 70**™ provides outstanding stability in its resistance to the oxidation effects of quenching operations. It exhibits excellent thermal stability, retaining its original viscosity in normal service. Additionally, this product minimizes cracking and distortion through controlled cooling of parts, requires no additive replacement, and its high flash point helps minimize fire hazards.

TYPICAL APPLICATIONS

D-A **Fast Quench 70**™ is recommended for use when deeper and more uniform hardening is required in steels having small grain size or wide variation in grain size, in steels lean in alloy content, when minimum distortion is required in high hardenability steels, or in parts having odd shapes or variable sections. It is also ideally suited for use when parts must retain a bright finish. Such parts are usually heat treated under a protective atmosphere. Conventional quenching oils do not "wet" the smooth, shiny surface. However, this product is formulated to adhere to the surface, thus preserving the bright finish and resulting in more even cooling.

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	15
Viscosity @ 40°C, cSt	ASTM D445	14.5
Pour Point, °F (°C)	ASTM D5949	-10 (-24)
Flash Point, °F (°C)	ASTM D92	375 (190)
API Gravity	ASTM D287	34.6
Density, lbs/gal (g/L)	Calculated	7.11 (852)
GM Magnetic Quenchometer, sec	ASTM D3520	10.4
Conradson Carbon Residue, mass %	ASTM D189	0.54
Quench Oil Stain Test		Pass
Color	ASTM D1500	Opaque

D-A PART NUMBER

Bulk	46701
Tote – 330 Gal	46703

WearGuard™ SYN 6000 Series

WearGuard™ SYN 6000 Series is full synthetic and has been formulated from premium polyalphaolefin (PAO) base fluids for enclosed gear systems requiring ashless antioxidants and anti-wear properties. These oils have been blended with D-A's advanced **ChemGuard™** additive technology and designed to provide proper lubrication under hydrodynamic and mild boundary lubrication conditions. This product is recommended for gear systems where moderate loads and high temperatures are expected, including worm gears containing soft metals such as bronze, brass and copper. **WearGuard™ SYN 6000 Series** is also considered a multi-purpose lubricant that can be used in a wide variety of industrial applications.

They are similar to petroleum oils in their compatibility with seals, hoses, gaskets and paint. The **WearGuard™ SYN 6000 Series** is recommended for Rotary Screw, Rotary Vane, Centrifugal and Reciprocating Compressors. In addition, it is also recommended for Hydraulic Systems, Enclosed Gear Units: i.e. Spur, Helical, Bevel & Worm Gears, Plain and Roller Contact Bearings, Circulating and Splash Lubricated Systems including Mist Systems.

PRODUCT FEATURES AND BENEFITS

- 100% Synthetic Lubricant
- Wide Temperature Range
- Low Pour Points
- High Flash Points
- Increased Thermal & Oxidative Stability

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	150	220
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 18.29 156.3	 24.14 230.4
Viscosity Index	ASTM D2270	131	131
Pour Point, °F (°C)	ASTM D97	-49 (-45)	-31 (-35)
Flash Point, °F (°C)	ASTM D92	500 (260)	504 (262)
API Gravity	ASTM D4052	31.1	31.1
Copper Strip Corrosion	ASTM D130	1b	1b
Rust Test	ASTM D665	Pass	Pass
Evaporation, %	ASTM D972	<1%	<1%

D-A PART NUMBER

	150	220
Bulk	IP72751	IP72761
Drum – 55 Gal	IP72752	IP72762

WearGuard™ SYN 8000s Series

WearGuard™ SYN 8000s Series are a fully synthetic, high performance gear oils formulated with superior polyalkylene glycol (PAG)-based oils. This product is blended with D-A's advanced **ChemGuard™** additive technology that includes premium anti-oxidants, anti-wear, and corrosion inhibitor additives.

The **WearGuard™ SYN 8000s Series** is recommended for industrial worm gear lubrication. They can also function well with Rotary Screw, Rotary Vane, Centrifugal and Reciprocating Compressors, including Vacuum Pumps and Enclosed gears and bearings.

PRODUCT FEATURES AND BENEFITS

- Resists hydrocarbon washout/dilution
- High load carrying capacity
- Reduced sludge and deposit formation
- Excellent oxidative and thermal stability
- Low friction and less power consumption
- Good steel on steel and steel on bronze anti-wear

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	150	220	320
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 25 150	 38 220	 58 340.6
Viscosity Index	ASTM D2270	223	225	240
Pour Point, °F (°C)	ASTM D97	-44 (-42)	-35 (-37)	-29 (-35)
Flash Point, °F (°C)	ASTM D92	530 (270)	540 (280)	540 (280)
API Gravity	ASTM D4052	3.26	3.26	3.26
FZG Test, Pass Stage	ASTM D5182	11	12	12
Rust Test	ASTM D665	Pass	Pass	Pass

D-A PART NUMBER

	150	220	320
Drum 55 Gal	IP73452	IP73462	IP73472
Pail (Plastic) – 5 Gal	IP73458	IP73468	N/A

WearGuard™ SYN Turbine Oil

WearGuard™ SYN Turbine Oil Series begins with premium synthetic PAO base oils optimized for extended drain intervals while providing outstanding protection even in the most demanding operating conditions. This high-performance product exhibits superior thermal stability, reduced volatility and compatibility with mineral oils including elastomers and seals.

WearGuard™ SYN Turbine Oil Series is blended with D-A's advanced **ChemGuard™** additive technology. It excels with comprehensive ashless and phosphorous-free rust and oxidation inhibitors (R&O) to provide extended fluid life. This product rigorously impedes foaming and undesirable varnishing from coke deposits. The proprietary **ChemGuard™** additive also delivers demulsibility characteristics while resisting filter plugging from sludge formation and foreign contaminants.

PRODUCT FEATURES AND BENEFITS
- Synthetic performance for extended drain intervals
- Excellent R&O inhibitor
- Thermal stability
- Reduces maintenance costs
- Anti-foam properties

TYPICAL APPLICATIONS
Alstrom HTGD 90117
Cincinnati Milacron P-38, P-55, P-57
DIN 51524, Part 1; 51515 Part 1
Denison HF-1
General Electric GEK-23568, GEK-107395
Hägglunds Denison, HF-0 Bench Tests
Siemens TLV 9013 04
Solar Turbines ES9-224

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	32
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 5.4 28.8 - 35,2
Viscosity Index	ASTM D2270	144
Pour Point, °F (°C)	ASTM D97	-90 (-68)
Flash Point, °F (°C)	ASTM D92	470 (243)
API Gravity	ASTM D4052	37.9

D-A PART NUMBER

Bulk	IP53911
Drum – 55 Gal	IP53912

WearGuard™ Turbine Oil

WearGuard™ Turbine Oil Series begins with premium hydro-treated base oils optimized for providing outstanding protection even in the most demanding operating conditions. This high-performance product exhibits excellent thermal stability, reduced volatility and compatibility with elastomers and seals.

WearGuard™ Turbine Oil Series is blended with D-A's advanced **ChemGuard™** additive technology. It excels with comprehensive ashless and phosphorous-free rust and oxidation (R&O) inhibitors to provide extended fluid life. This product rigorously impedes foaming and undesirable varnishing from coke deposits. The proprietary **ChemGuard™** additive also delivers demulsibility characteristics while resisting filter plugging from sludge formation and foreign contaminants.

PRODUCT FEATURES AND BENEFITS

- Excellent R&O inhibitor
- Thermal stability
- Extends drain intervals
- Reduces maintenance costs
- Ashless anti-wear

TYPICAL APPLICATIONS

Meets or Exceeds
ASTM D4304-13
Cincinnati Milacron P-38, P-55, P-54 and P-57
DIN 51524, Part 1
General Electric GEK-32568
Hägglunds Denison, HF-1
Hägglunds Denison, HF-0 Bench Tests
JIS K-2213 type 2
Siemens TLV 9013 04
Solar Turbines ES9-224
U.S. Military MIL-H-17672D

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	32	46
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 5.4 32	 6.8 46
Viscosity Index	ASTM D2270	105	105
Pour Point, °F (°C)	ASTM D97	-36 (-38)	-31 (-35)
Flash Point, °F (°C)	ASTM D92	430 (221)	435 (224)
API Gravity	ASTM D4052	31.8	30.9

D-A PART NUMBER

	32	46
Bulk	IP72911	IP72921
Tote – 330 Gal	IP72913	IP72923
Drum – 55 Gal	IP72912	N/A
Pail (Metal) – 5 Gal	IP72919	N/A

Way Lube

D-A **Way Lube** is a premium-formulated lubricant for machine tool slides and ways. **Way Lube** is manufactured from select base oils fortified with extreme pressure, tackiness, and friction modifying additives. This well-balanced blend provides superior slip-stick protection to ensure smooth and consistent movement for optimum surface finish. Furthermore, D-A **Way Lube** exhibits excellent separation from coolants. This property allows easy removal for reuse and reduces susceptibility for bacteria growth in coolant sumps.

PRODUCT FEATURES AND BENEFITS

- D-A's select base oils fortified with extreme pressure, adhesive agent and friction modifiers provide superior slip- stick protection.
- Excellent separation ability from coolants allows easy removal for reuse. Coolant separation ability reduces bacteria growth in coolant sump.
- Slip-stick protection ensures smooth and consistent movement for optimum surface finish.

TYPICAL APPLICATIONS

Machine tool components:
Headstock
Translating screws
Lightly loaded gears (including worm gears)
Lightly loaded hydraulic systems
Use where Cincinnati Machine P-50 oils are specified (ISO 220)
Use where Cincinnati Machine P-47 oils are specified (ISO 68)

TYPICAL PROPERTIES

ISO Viscosity Grade	Test Method	32	46	68	100	150	220
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 5.87 32.46	 7.25 45.52	 9.19 67.45	 11.73 100.5	 15.22 150	 19.33 219
Viscosity Index	ASTM D2270	122	119	113	105	102	100
Pour Point, °F (°C)	ASTM D97	-40 (-40)	-35 (137)	-29 (-34)	-24 (-31)	-4 (-20)	-2 (-19)
Flash Point, °F (°C)	ASTM D92	405 (207)	425 (218)	435 (224)	440 (227)	440 (227)	445 (229)
API Gravity	ASTM D4052	34.4	32.8	31.7	30.2	28.9	27.5

D-A PART NUMBER

	32	**46**	**68**	**100**	**150**	**220**
Bulk	54411	54421	54431	54441	54451	54461
Tote – 330 Gal	N/A	54423	54433	54443	N/A	54463
Drum – 55 Gal	54412	54422	54432	54442	54452	54462
Pail (Plastic) – 5 Gal	N/A	N/A	54438	N/A	N/A	N/A

WearGuard™ Wireline Lubricant

WearGuard™ Wireline Lubricant is a premium quality lubricant specifically formulated for oil and gas exploration/ production wireline operation. It's highly refined base oil/selective additive combination makes it an ideal lubrication for braided wireline and cables utilized in oil and gas wells.

PRODUCT FEATURES AND BENEFITS

WearGuard™ Wireline Lubricant provides excellent characteristics for enhanced low temperature performance and imparts non-corrosive properties that continuously protect components from rust and corrosion. **WearGuard™ Wireline Lubricant** affords a unique "clingability" which reduces lubricant discharge and safeguards against "down-hole" well pressures, H2S (Hydrogen Sulfide) exposure and other corrosive materials. Additionally, it employs essential anti-friction characteristics for wear prevention.

WearGuard™ Wireline Lubricant provides the following benefits:

- Exceptional rust and corrosion protection
- Superior low temperature properties for cold ambient temperatures
- Excellent adhesive / sealing properties
- Promotes wireline longevity
- Withstands corrosive environs
- 100% Made in the USA

TYPICAL APPLICATIONS

WearGuard™ Wireline Lubricant is the appropriate choice for most oil and gas wireline operation and various cable systems. It was designed and formulated with the needs of the application in mind utilizing only the best in base oil quality and additive technology. Always consult with OEM (Original Equipment Manufacturer) for appropriate lubricant viscosity and quality selection.

TYPICAL PROPERTIES

ISO Viscosity Grade	ASTM D2422	68	680	1500
Color	ASTM D1500	L0.5	L0.5	L0.5
Viscosity @ 100°C, cSt @ 40°C, cSt	 ASTM D445 ASTM D445	 11.11 70.3	 79.52 664.1	 162.6 1513.9
Viscisity Index	ASTM D2270	161	204	226
Pour Point	ASTM D97	-31 (-35)	-22 (-30)	-13 (-25)
Flash Point, °F (°C)	ASTM D92	435 (224)	440 (227)	440 (227)
Specific Gravity @ 60°F	ASTM D4052	0.8514	0.8509	0.8509

D-A PART NUMBER

	68	680	1500
Bulk	IP75031	IP75091	IP75101
Tote – 330 Gal	IP75033	IP75093	N/A

PERFORMANCE ENGINEERED LUBRICANTS SINCE 1919

MADE IN USA

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