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rev07/23/2018
Committed to the European Market

Our team of highly trained professionals, dedicated strictly to the lubrication market, gives us the ability to be responsive to your needs from both a technical as well as a commercial perspective, and in doing so provide a level of service second to none.
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This brochure contains brief descriptions of most of the products sold by Vanderbilt Chemicals, LLC to the lubricating oil and grease industry. The products not included in this brochure are either experimental, or those that are only available on a local basis. We also welcome inquiries with regard to custom-made lubricants or joint research projects. For more detailed information, please contact your Vanderbilt Chemicals Technical Sales Representative, or the Petroleum Department at our corporate office in Norwalk, Connecticut.

Vanderbilt Chemicals, LLC will continuously improve all products and services to consistently meet customer expectations the first time and every time.
# Quick-Scan Application/Function Guide

| APPLICATION | CUVAN® 303 | CUVAN® 864 | MOLYVAN® A | MOLYVAN® L | MOLYVAN® FE Plus | MOLYVAN® 607NHT | MOLYVAN® 852NHT | MOLYVAN® 855 | MOLYVAN® 3000 | MOLYVAN® A | MOLYVAN® L | MOLYVAN® FEI Plus | MOLYVAN® 807N | MOLYVAN® 822N | MOLYVAN® 855 | MOLYVAN® 3000 | NACAP® | VANCHEM® DMTD | VANCHEM® NAIT | VANLUBE® AZ | VANLUBE® BNC | VANLUBE® EZ | VANLUBE® RA | VANLUBE® RG | VANLUBE® RR-CN | VANLUBE® RR-ZSN | VANLUBE® SS | VANLUBE® TK-100* | VANLUBE® TK-200* | VANLUBE® TK-223* | VANLUBE® W-334 | VANLUBE® 73 | VANLUBE® 81 | VANLUBE® 75 Super Plus | VANLUBE® 89 |
|-------------|-----------|-----------|------------|------------|-----------------|-----------------|-----------------|--------------|--------------|------------|------------|-----------------|----------------|-------------|--------------|--------------|--------------|-------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------|------------|-----------------|----------|
| Coolant     | ✓         | ✓         | ✓          | ✓          | ✓               | ✓               | ✓               | ✓            | ✓            | ✓          | ✓          | ✓               | ✓              | ✓           | ✓            | ✓            | ✓            | ✓           | ✓              | ✓              | ✓              | ✓              | ✓              | ✓            | ✓           | ✓              | ✓         |
| Water-Based Fluids | ✓         | ✓         | ✓          | ✓          | ✓               | ✓               | ✓               | ✓            | ✓            | ✓          | ✓          | ✓               | ✓              | ✓           | ✓            | ✓            | ✓            | ✓           | ✓              | ✓              | ✓              | ✓              | ✓              | ✓            | ✓           | ✓              | ✓         |
| Auto Transmission Fluid | ✓         | ✓         | ✓          | ✓          | ✓               | ✓               | ✓               | ✓            | ✓            | ✓          | ✓          | ✓               | ✓              | ✓           | ✓            | ✓            | ✓            | ✓           | ✓              | ✓              | ✓              | ✓              | ✓              | ✓            | ✓           | ✓              | ✓         |
| Compressor Oil | ✓         | ✓         | ✓          | ✓          | ✓               | ✓               | ✓               | ✓            | ✓            | ✓          | ✓          | ✓               | ✓              | ✓           | ✓            | ✓            | ✓            | ✓           | ✓              | ✓              | ✓              | ✓              | ✓              | ✓            | ✓           | ✓              | ✓         |
| Engine Oil  | ✓         | ✓         | ✓          | ✓          | ✓               | ✓               | ✓               | ✓            | ✓            | ✓          | ✓          | ✓               | ✓              | ✓           | ✓            | ✓            | ✓            | ✓           | ✓              | ✓              | ✓              | ✓              | ✓              | ✓            | ✓           | ✓              | ✓         |
| Fuel        | ✓         | ✓         | ✓          | ✓          | ✓               | ✓               | ✓               | ✓            | ✓            | ✓          | ✓          | ✓               | ✓              | ✓           | ✓            | ✓            | ✓            | ✓           | ✓              | ✓              | ✓              | ✓              | ✓              | ✓            | ✓           | ✓              | ✓         |
| Gear Oil    | ✓         | ✓         | ✓          | ✓          | ✓               | ✓               | ✓               | ✓            | ✓            | ✓          | ✓          | ✓               | ✓              | ✓           | ✓            | ✓            | ✓            | ✓           | ✓              | ✓              | ✓              | ✓              | ✓              | ✓            | ✓           | ✓              | ✓         |
| Grease      | ✓         | ✓         | ✓          | ✓          | ✓               | ✓               | ✓               | ✓            | ✓            | ✓          | ✓          | ✓               | ✓              | ✓           | ✓            | ✓            | ✓            | ✓           | ✓              | ✓              | ✓              | ✓              | ✓              | ✓            | ✓           | ✓              | ✓         |
| Hydraulic Oil | ✓         | ✓         | ✓          | ✓          | ✓               | ✓               | ✓               | ✓            | ✓            | ✓          | ✓          | ✓               | ✓              | ✓           | ✓            | ✓            | ✓            | ✓           | ✓              | ✓              | ✓              | ✓              | ✓              | ✓            | ✓           | ✓              | ✓         |
| Metalworking | ✓         | ✓         | ✓          | ✓          | ✓               | ✓               | ✓               | ✓            | ✓            | ✓          | ✓          | ✓               | ✓              | ✓           | ✓            | ✓            | ✓            | ✓           | ✓              | ✓              | ✓              | ✓              | ✓              | ✓            | ✓           | ✓              | ✓         |
| Rust Preventive | ✓       | ✓         | ✓          | ✓          | ✓               | ✓               | ✓               | ✓            | ✓            | ✓          | ✓          | ✓               | ✓              | ✓           | ✓            | ✓            | ✓            | ✓           | ✓              | ✓              | ✓              | ✓              | ✓              | ✓            | ✓           | ✓              | ✓         |
| Synthetic Lube | ✓         | ✓         | ✓          | ✓          | ✓               | ✓               | ✓               | ✓            | ✓            | ✓          | ✓          | ✓               | ✓              | ✓           | ✓            | ✓            | ✓            | ✓           | ✓              | ✓              | ✓              | ✓              | ✓              | ✓            | ✓           | ✓              | ✓         |
| Turbine Oil | ✓         | ✓         | ✓          | ✓          | ✓               | ✓               | ✓               | ✓            | ✓            | ✓          | ✓          | ✓               | ✓              | ✓           | ✓            | ✓            | ✓            | ✓           | ✓              | ✓              | ✓              | ✓              | ✓              | ✓            | ✓           | ✓              | ✓         |
| FUNCTION     |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| Ashless     | ✓         | ✓         | ✓          | ✓          | ✓               | ✓               | ✓               | ✓            | ✓            | ✓          | ✓          | ✓               | ✓              | ✓           | ✓            | ✓            | ✓            | ✓           | ✓              | ✓              | ✓              | ✓              | ✓              | ✓            | ✓           | ✓              | ✓         |
| High Temp.  | ✓         | ✓         | ✓          | ✓          | ✓               | ✓               | ✓               | ✓            | ✓            | ✓          | ✓          | ✓               | ✓              | ✓           | ✓            | ✓            | ✓            | ✓           | ✓              | ✓              | ✓              | ✓              | ✓              | ✓            | ✓           | ✓              | ✓         |
| Antioxidant | 2         | 2         | 2          | 2          | 1               | 2               | 2               | 2            | 2            | 1          | 1          | 1               | 1              | 1           | 2            | 2            | 2            | 1           | 2               | 2              | 2              | 2              | 2              | 2            | 2           | 2              | ✓         |
| Antioxidant/ Antiscuff  | 2         | 2         | 2          | 2          | 1               | 2               | 2               | 2            | 2            | 1          | 1          | 1               | 1              | 1           | 2            | 2            | 2            | 1           | 2               | 2              | 2              | 2              | 2              | 2            | 2           | 2              | ✓         |
| Friction Reducer | 1         | 1         | 1          | 1          | 1               | 1               | 1               | 1            | 1            | 1          | 1          | 1               | 1              | 1           | 1            | 1            | 1            | 1           | 1               | 1              | 1              | 1              | 1              | 1            | 1           | 1              | ✓         |
| Corrosion Inhibitor | 1         | 1         | 2          | 1          | 1               | 2               | 2               | 2            | 2            | 2          | 2          | 2               | 2              | 2           | 2            | 2            | 2            | 2           | 2               | 2              | 2              | 2              | 2              | 2            | 2           | 2              | ✓         |
| Demulsifier |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| Chemical Intermediate | 1         | 1         | 1          | 1          | 1               | 1               | 1               | 1            | 1            | 1          | 1          | 1               | 1              | 1           | 1            | 1            | 1            | 1           | 1               | 1              | 1              | 1              | 1              | 1            | 1           | 1              | ✓         |
| Extreme Pressure | 2         | 2         | 2          | 2          | 2               | 2               | 2               | 2            | 2            | 2          | 2          | 2               | 2              | 2           | 2            | 2            | 2            | 2           | 2               | 2              | 2              | 2              | 2              | 2            | 2           | 2              | ✓         |
| Metal Deactivator | 1         | 1         | 1          | 1          | 1               | 1               | 1               | 1            | 1            | 1          | 1          | 1               | 1              | 1           | 1            | 1            | 1            | 1           | 1               | 1              | 1              | 1              | 1              | 1            | 1           | 1              | ✓         |
| Rust Inhibitor |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |

✓ = Application/Function    1 = Primary Function    2 = Secondary Function    * = Tackifier

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| FUNCTION              |               |             |             |             |              |             |             |             |             |              |             |             |             |             |             |             |             |             |             |             |             |             |             |
| Ashless               |               |             |             |             |              |             |             |             |             |              |             |             |             |             |             |             |             |             |             |             |             |             |
| High Temp.            |               |             |             |             |              |             |             |             |             |              |             |             |             |             |             |             |             |             |             |             |             |             |
| Antioxidant          |               |             |             |             |              |             |             |             |             |              |             |             |             |             |             |             |             |             |             |             |             |             |
| Antwear/Antiscuff     |               |             |             |             |              |             |             |             |             |              |             |             |             |             |             |             |             |             |             |             |             |             |
| Friction Reducer     |               |             |             |             |              |             |             |             |             |              |             |             |             |             |             |             |             |             |             |             |             |             |
| Corrosion Inhibitor  |               |             |             |             |              |             |             |             |             |              |             |             |             |             |             |             |             |             |             |             |             |             |
| Demulsifier          |               |             |             |             |              |             |             |             |             |              |             |             |             |             |             |             |             |             |             |             |             |             |
| Chemical Intermediate|               |             |             |             |              |             |             |             |             |              |             |             |             |             |             |             |             |             |             |             |             |             |
| Extreme Pressure     |               |             |             |             |              |             |             |             |             |              |             |             |             |             |             |             |             |             |             |             |             |             |
| Metal Deactivator    |               |             |             |             |              |             |             |             |             |              |             |             |             |             |             |             |             |             |             |             |             |             |
| Rust Inhibitor       |               |             |             |             |              |             |             |             |             |              |             |             |             |             |             |             |             |             |             |             |             |             |

✓ = Application/Function
1 = Primary Function
2 = Secondary Function

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CUVAN® 303
Metal Deactivator

Application: Auto Transmission Fluid, Compressor Oil, Engine Oil, Fuel, Gear Oil, Grease, Hydraulic Oil, Metalworking, Synthetic Lube, Turbine Oil
Function: Ashless, Corrosion Inhibitor, Metal Deactivator
Chemical Composition: N, N-bis(2-ethylhexyl)-ar-methyl-1H-benzotriazole-1-methanamine
Physical State/Color: Liquid/Amber
Density @ 15.6°C Mg/m³ (lb/gal): 0.95 (7.9) @ 25°C
Viscosity @ 100°C mm²/s: 5.81
Flash Point (PMCC), °C: 125
Solubility: Soluble in petroleum and synthetic lubricant bases. Insoluble in water.
Use Concentration, % mass: 0.05 - 0.20
Typical Uses: CUVAN® 303 is an oil-soluble corrosion inhibitor and metal deactivator for lubricants, greases and metalworking fluids. As a corrosion inhibitor, it is effective in protecting copper, copper alloys, cadmium, cobalt, silver and zinc. As a metal deactivator, it is effective in precipitating ions of the same metals, thus preventing galvanic corrosion of other metal surfaces and inhibiting these ions from acting as oxidation catalysts.

NSF® Certified HX-1, 138995

CUVAN 484
Metal Deactivator

Application: Compressor Oil, Engine Oil, Gear Oil, Grease, Hydraulic Oil, Metalworking, Turbine Oil
Function: Ashless, Antioxidant, Antiwear/Antiscuff, Corrosion Inhibitor, Metal Deactivator
Chemical Composition: 2,5 dimercapto-1,3,4-thiadiazole derivative
Physical State/Color: Liquid/Amber
Density @ 15.6°C Mg/m³ (lb/gal): 1.07 (9.0)
Viscosity @ 100°C mm²/s: 11
Flash Point (PMCC), °C: 76
Solubility: Soluble in petroleum and synthetic lubricant bases. Insoluble in water.
Use Concentration, % mass: 0.10 - 0.50
Typical Uses: CUVAN® 484 is an ashless oil-soluble corrosion inhibitor and metal deactivator for nonferrous metals, particularly for copper. Useful in industrial and automotive oils and greases, metalworking fluids, etc. CUVAN 484 may also enhance the antiwear and oxidation properties of lubricants.

CUVAN 826
Metal Deactivator

Application: Compressor Oil, Engine Oil, Fuel, Gear Oil, Grease, Hydraulic Oil, Metalworking, Turbine Oil
Function: Ashless, Antioxidant, Corrosion Inhibitor, Metal Deactivator
Chemical Composition: 2,5 dimercapto-1,3,4-thiadiazole derivative
Physical State/Color: Liquid/Amber
Density @ 15.6°C Mg/m³ (lb/gal): 1.04 (8.6)
Viscosity @ 100°C mm²/s: 3.32
Flash Point (PMCC), °C: 192
Solubility: Soluble in petroleum lubricating bases.
Use Concentration, % mass: 0.10 - 0.50
Typical Uses: CUVAN® 826 is a ashless oil-soluble corrosion inhibitor and metal deactivator for nonferrous metals, particularly for copper. It is useful in industrial and automotive oils and greases, metalworking fluids, etc. CUVAN 826 has a unique composition enables it to suppress the corrosive action of hydrogen sulfide.
MOLYVAN® A
Friction Reducer

Application: Grease, Synthetic Lube
Function: High Temperature, Antioxidant, Antiwear/Antiscuff, Friction Reducer, Extreme Pressure
Chemical Composition: Molybdenum di-n-butylidithio-carbamate
Physical State/Color: Powder/Yellow
Density @ 15.6°C Mg/m³ (lb/gal): 1.59 @ 25°C
Solubility: Slightly soluble in aromatic hydrocarbons. Insoluble in water.
Use Concentration, % mass: 0.5 - 3.0

Typical Uses: MOLYVAN® A is used in long life chassis greases for ball joints, steering linkages and other lubricating greases requiring good antioxidant and antiwear at high temperatures for long periods of time. It is an organic molybdenum extreme pressure and antiwear additive for petroleum and synthetic lubricants. It has good high temperature stability. In lubricating greases it is superior to inorganic molybdenum additives for both antiwear and antioxidant properties. MOLYVAN A is slightly basic and does not promote rusting. It has a low specific gravity which makes it easy to disperse with simple equipment. It is used in non-petroleum base valve lubricants.
Not recommended for diesel engine oils without proper corrosion testing and voluntary assumption of risk.

MOLYVAN L
Friction Reducer

Application: Engine Oil, Gear Oil, Grease, Metalworking, Synthetic Lube
Function: Antioxidant, Antiwear/Antiscuff, Friction Reducer, Extreme Pressure
Chemical Composition: Molybdenum di(2-ethylhexyl) phosphorodithioate
Physical State/Color: Liquid/Dark Green
Density @ 15.6°C Mg/m³ (lb/gal): 1.08 (9.0)
Viscosity @ 100°C mm²/s: 8.6
Flash Point (PMCC), °C: 142
Solubility: Soluble in petroleum and synthetic lubricant bases. Insoluble in water.
Use Concentration, % mass: 0.25 - 1.0

Typical Uses: MOLYVAN® L is an oil-soluble organic molybdenum additive containing sulfur and phosphorus. It functions as a friction reducer, antioxidant, antiwear, and extreme pressure agent. It is used in engine oils, metalworking compositions and in a variety of industrial and automotive lubricating oils, greases and specialties. MOLYVAN L is an outstanding antiwear agent. It is quite useful in automotive and industrial gear oils and greases which operate under heavy load conditions.
Not recommended for diesel engine oils without proper corrosion testing and voluntary assumption of risk.

MOLYVAN FEI Plus
Friction Reducer

Application: Engine Oil
Function: Friction Reducer, Antioxidant, Antiwear
Chemical Composition: Antioxidant, Antiwear, Friction Reducer Blend
Physical State/Color: Liquid/Dark Amber to Brown
Density @ 15.6°C Mg/m³ (lb/gal): 1.01 @ 25°C
Viscosity @ 100°C mm²/s: 10.8
Flash Point (PMCC), °C: 178
Solubility: Soluble in petroleum and synthetic lubricant base stocks. Insoluble in water.
Use Concentration, % mass: 0.1 - 4.0

Typical Uses: MOLYVAN® FEI Plus is a lubricant composition that when combined with a dispersant, detergent, VI improver and base oil constitutes a low phosphorus, high molybdenum containing engine oil with enhanced fuel economy and catalyst compatibility.
Not recommended for diesel engine oils without proper corrosion testing and voluntary assumption of risk.
MOLYVAN® 807NT
Friction Reducer

Application: Engine Oil, Gear Oil, Grease, Synthetic Lube
Function: Antioxidant, Antiwear/Antiscuff, Friction Reducer, Extreme Pressure
Chemical Composition: Molybdenum dialkyldithiocarbamate in oil
Physical State/Color: Liquid/Dark Green
Density @ 15.6°C Mg/m³ (lb/gal): 0.97 (8.1)
Viscosity @ 100°C mm²/s: 13
Flash Point (PMCC), °C: 135
Solubility: Soluble in petroleum and synthetic lubricant bases. Insoluble in water.
Use Concentration, % mass: 0.25 - 0.5

Typical Uses: MOLYVAN® 807NT offers a unique molybdenum-sulfur combination in an oil-soluble form which is easy to blend into lubricants. It can be used to maintain the antifriction properties of an engine oil while reducing the phosphorus content. To obtain significant increases in extreme pressure properties and to impart improved antiwear performance. MOLYVAN 807NT can be used in combination with VANLUBE® 7723 Antioxidant, a nonmetallic dithiocarbamate which functions as an antioxidant and extreme pressure agent. Not recommended for diesel engine oils without proper corrosion testing and voluntary assumption of risk.

MOLYVAN® 822NT
Friction Reducer

Application: Engine Oil, Gear Oil, Grease, Synthetic Lube
Function: Antioxidant, Antiwear/Antiscuff, Friction Reducer, Extreme Pressure
Chemical Composition: Molybdenum dialkyldithiocarbamate in oil
Physical State/Color: Liquid/Brown
Density @ 15.6°C Mg/m³ (lb/gal): 0.97 (8.1)
Viscosity @ 100°C mm²/s: 13
Flash Point (PMCC), °C: 135
Solubility: Soluble in petroleum and synthetic lubricant bases. Insoluble in water.
Use Concentration, % mass: 0.25 - 0.5

Typical Uses: MOLYVAN® 822NT may be used to maintain or improve the antifriction properties of an engine oil while reducing the phosphorus content. Not recommended for diesel engine oils without proper corrosion testing and voluntary assumption of risk.

MOLYVAN® 855
Friction Reducer

Application: Engine Oil, Grease, Metalworking
Function: Antioxidant, Antiwear/Antiscuff, Friction Reducer
Chemical Composition: Organomolybdenum complex
Physical State/Color: Liquid/Brown
Density @ 15.6°C Mg/m³ (lb/gal): 1.08 (8.9)
Viscosity @ 100°C mm²/s: 55
Flash Point (PMCC), °C: 193
Solubility: Soluble in petroleum and synthetic lubricant bases. Insoluble in water.
Use Concentration, % mass: 0.1 - 1.0

Typical Uses: MOLYVAN®855 is a liquid organomolybdenum friction reducer specifically designed for crankcase oils. MOLYVAN 855 provides engine oils with a substantial reduction in the coefficient of friction. Not recommended for diesel engine oils without proper corrosion testing and voluntary assumption of risk.
MOLYVAN® 3000
Friction Reducer

**Application:** Engine Oils, Gear Oils, Greases, Synthetic Lubes  
**Function:** Friction Reducer, Antiwear/Antiscuff, Extreme Pressure  
**Chemical Composition:** Molybdenum Dithiocarbamate in oil  
**Physical State/Color:** Liquid/Brown  
**Density @ 15.6°C Mg/m³ (lb/gal):** 1.05  
**Viscosity @ 100°C mm²/s:** 50 - 100  
**Flash Point (PMCC), °C:** >145  
**Solubility:** Soluble in petroleum and synthetic base oils. Insoluble in water.  
**Use Concentration, % mass:** 0.1 - 1.0  
**Typical Uses:** MOLYVAN® 3000 may be used to maintain or improve the antifriction properties of an engine oil while reducing the phosphorus content. Not recommended for diesel engine oils without proper corrosion testing and voluntary assumption of risk.

NACAP®
Corrosion Inhibitor

**Application:** Coolant, Water-Based Fluids  
**Function:** Antioxidant, Corrosion Inhibitor, Chemical Intermediate, Metal Deactivator  
**Chemical Composition:** Sodium 2-mercaptobenzothiazole, 50% aqueous solution  
**Physical State/Color:** Liquid/Light Amber  
**Density @ 15.6°C Mg/m³ (lb/gal):** 1.27 (10.6)  
**Solubility:** Soluble in water, alcohols and glycols. Insoluble in petroleum hydrocarbons.  
**Use Concentration, % mass:** 0.1 - 0.6  
**Typical Uses:** NACAP® is a corrosion inhibitor for water, alcohol and glycol systems. It is particularly effective in preventing corrosion of copper and brass. Widely used in antifreeze, where it functions as a copper corrosion inhibitor and alkaline buffer. It is an excellent corrosion inhibitor for aluminum in systems where aluminum is used in the presence of copper and copper alloys. NACAP is one of the standard copper corrosion inhibitors for the antifreeze industry. Used as a chemical intermediate.

VANCHEM™ DMTD
Metal Deactivator

**Application:** Coolant, Water-Based Fluids, Metalworking  
**Function:** Ashless, Corrosion Inhibitor, Chemical Intermediate, Metal Deactivator  
**Chemical Composition:** 2,5-dimercapto-1,3,4-thiadiazole  
**Physical State/Color:** Powder/Cream to Light Yellow  
**Density @ 15.6°C Mg/m³ (lb/gal):** 1.79  
**Solubility:** Soluble in water, ethanol, acetone and diesters. Slightly soluble in petroleum lubricant bases, hexane, petroleum ether, chloroform and toluene.  
**Use Concentration, % mass:** Chemical Intermediate  
**Typical Uses:** VANCHEM™ DMTD’s common reactions are double decomposition reactions with soluble metal salts, salt formation with alkaline metal hydroxides, oxidation reactions involving mercaptans, addition reactions with organic compounds containing activated double bonds, reactions with epoxy groups, reactions with aldehydes and alcohols, salt formation with amines and ammonia and reactions with acyl chlorides. The two active sites on VANCHEM DMTD can generally be reacted successively.
VANCHEM™ NATD
Metal Deactivator

Application: Coolant, Water-Based Fluids, Metalworking
Function: Corrosion Inhibitor, Chemical Intermediate, Metal Deactivator
Chemical Composition: Disodium 2,5-dimercaptothiadiazole, 30% aqueous solution
Physical State/Color: Liquid/Amber
Density @ 15.6°C Mg/m³ (lb/gal): 1.22 (10.2)
Solubility: Soluble in water.
Use Concentration, % mass: 0.1 - 0.25

Typical Uses: VANCHEM™ NATD is a corrosion inhibitor and metal deactivator for nonferrous metals in aqueous systems. It is particularly indicated for the protection of solder, aluminum, copper and copper alloys. It is stable and active at lower pH values than many mercapto compounds. VANCHEM NATD as a stable reactive dimercaptide which is readily alkylated, oxidized to the disulfide, or converted to metal salts.

VANLUBE® AZ
Lubricant Additive

Application: Auto Transmission Fluid, Compressor Oil, Engine Oil, Gear Oil, Grease, Metalworking, Rust Preventive, Synthetic Lube
Function: Antioxidant, Antiwear/Antiscuff, Corrosion Inhibitor, Metal Deactivator
Chemical Composition: Zinc diamyldithiocarbamate in oil
Physical State/Color: Liquid/Amber
Density @ 15.6°C Mg/m³ (lb/gal): 1.02 (8.2)
Viscosity @ 100°C mm²/s: 9.8
Flash Point (PMCC), °C: 136
Solubility: Soluble in petroleum and synthetic lubricant bases. Insoluble in water.
Use Concentration, % mass: 0.25 - 4.0

Typical Uses: VANLUBE® AZ is used in engine oils, in industrial oils, and in soap and clay-thickened greases. Used in both gasoline and diesel crankcase oils to inhibit oxidation, bearing corrosion and wear. Used in combination with detergents, it inhibits corrosion and wear by inhibiting oxidation of the oil and also by the formation of protective films on metal surfaces. Used as a partial replacement for zinc dithiophosphates. Because of its effectiveness at high temperatures, it is a good additive for crankcase oils in heavy duty service. In industrial oils and automatic transmission fluids it functions as a high temperature oxidation and corrosion inhibitor. Used in lubricating greases both as an oxidation inhibitor and metal deactivator. An excellent copper corrosion inhibitor of film-forming type.

VANLUBE® EZ
Antioxidant

Application: Gear Oil, Grease, Metalworking, Synthetic Lube
Function: Antioxidant, Antiwear/Antiscuff, Extreme Pressure
Chemical Composition: 2,5-dimercapto-1,3,4-thiadiazole
Physical State/Color: Liquid/Yellowish/Amber
Density @ 15.6°C Mg/m³ (lb/gal): 1.1
Viscosity @ 100°C mm²/s: 40 - 70
Flash Point (PMCC), °C: 93
Solubility: Soluble in petroleum and synthetic lubricant bases. Insoluble in water.
Use Concentration, % mass: 0.1 - 2.0

Typical Uses: VANLUBE® EZ is a multifunctional additive that imparts excellent antiwear, extreme pressure, corrosion resistance and antioxidant properties to industrial lubricants and greases. It is a concentrated version of VANLUBE AZ.
VANLUBE PA
Antioxidant

**Application:** Auto Transmission Fluid, Compressor Oil, Engine Oil, Gear Oil, Grease, Hydraulic Oil, Metalworking, Synthetic Lube, Turbine Oil

**Function:** Ashless, Antioxidant

**Chemical Composition:** Alkylated diphenylamines & sterically hindered phenol

**Physical State/Color:** Liquid/Clear Yellow

**Density @ 15.6°C Mg/m³ (lb/gal):** 0.97

**Viscosity @ 40°C mm²/s:** 255

**Flash Point (PMCC), °C:** 200

**Solubility:** Soluble in petroleum and synthetic lubricant bases. Insoluble in water.

**Use Concentration, % mass:** 0.1 - 2.0

**Typical Uses:** VANLUBE® PA is a synergistic combination of alkylated diphenylamine (ADPA) and syerically hindered phenol. VANLUBE PA provides optimized antioxidant performance in many applications: Industrial Oils - turbine oil, hydraulic oils, compressor oils, heat transfer fluids, metalworking fluids and greases; Engine Oils - both passenger car and diesel engine oils; Automatic Transmission Fluids.

VANLUBE RD
Antioxidant

**Application:** Grease, Synthetic Lube

**Function:** Ashless, Antioxidant

**Chemical Composition:** Polymerized 1,2-dihydro-2,2,4-trimethylquinoline

**Physical State/Color:** Small Pastilles/Amber

**Density @ 15.6°C Mg/m³ (lb/gal):** 1.06

**Solubility:** Soluble in diesters, polyglycols and Ucon® fluids. Insoluble in water and petroleum oils.

**Use Concentration, % mass:** 0.1 - 1.0

**Typical Uses:** VANLUBE® RD inhibits oxidation in polyglycols, Ucon® fluids and diester synthetic lubricants. Good high temperature inhibitor for both petroleum and synthetic lubricants. Widely used in Ucon and polyglycol brake fluids at concentrations of 0.1 to 0.25%. Prevents the depolymerization of polyoxyethylene and similar polymers. Used as a high temperature oxidation inhibitor in both petroleum and synthetic base lubricating greases. Effective in both static (ASTM grease pressure vessel and dynamic (bearing life or spindle) oxidation tests.

VANLUBE® SB
Lubricant Additive

**Application:** Engine Oil, Gear Oil, Grease, Metalworking

**Function:** Antiwear/Antiscuff, Extreme Pressure

**Chemical Composition:** Sulfur-based additive

**Physical State/Color:** Liquid/Amber

**Density @ 15.6°C Mg/m³ (lb/gal):** 1.14 (9.5)

**Viscosity @ 100°C mm²/s:** 10

**Flash Point (PMCC), °C:** 79

**Solubility:** Soluble in petroleum and synthetic lubricant bases. Insoluble in water.

**Use Concentration, % mass:** 1.0 - 2.0

**Typical Uses:** VANLUBE® SB is a sulfur-based additive used in the formulation of industrial gear oils, automotive and industrial greases of various types, and other formulations where noncorrosive sulfur is desired. VANLUBE SB is an economical source of sulfur in a form that provides good load-carrying and antiwear properties combined with low copper corrosion.
VANLUBE SS
Antioxidant

Application: Auto Transmission Fluid, Compressor Oil, Engine Oil, Grease, Synthetic Lube, Turbine Oil
Function: Ashless, High Temperature, Antioxidant
Chemical Composition: Octylated diphenylamines
Physical State/Color: Powder/Light Tan
Density @ 15.6°C Mg/m³ (lb/gal): 1.02
Solubility: Soluble in petroleum and synthetic lubricant bases. Insoluble in water.
Use Concentration, % mass: 0.5 - 2.0

Typical Uses: VANLUBE® SS is a general-purpose antioxidant. It is used as a high temperature antioxidant in petroleum and synthetic lubricants. Effective as an antioxidant and corrosion inhibitor in silane and siloxane synthetic lubricants - both in fluids and greases. Used in hydraulic fluids, various industrial oils, automatic transmission fluids and synthetic and petroleum-based engine oils.

NSF® Certified HX-1, 155717

VANLUBE BHC
Antioxidant

Application: Auto Transmission Fluid, Compressor Oil, Engine Oil, Gear Oil, Grease, Hydraulic Oil, Metalworking, Synthetic Lube, Turbine Oil
Function: Ashless, Antioxidant
Chemical Composition: Butylated hydroxy-hydrocinnamate
Physical State/Color: Liquid/Yellowish
Density @ 15.6°C Mg/m³ (lb/gal): 0.9665
Viscosity @ 100°C mm²/s: 6.2
Flash Point (PMCC), °C: 152
Solubility: Soluble in petroleum and synthetic lubricant bases. Insoluble in water.
Use Concentration, % mass: 0.1 - 2.0

Typical Uses: VANLUBE® BHC is an effective general purpose, nonstaining, ashless antioxidant that provides excellent oxidative stability to wide range of automotive and industrial lubricants. It has excellent solubility in mineral and non-conventional base stocks, and contains no diluents. It is easy to handle and will not crystallize at low temperatures. It has low volatility and helps control oxidation and high temperature deposits especially when combined with alkylated diphenylamines, molybdenum compounds, sulfur-containing antioxidants and/or phosphites in many industrial oils and automotive lubricants.

VANLUBE® RI-A
Lubricant Additive

Application: Gear Oil, Grease, Hydraulic Oil, Rust Preventive, Turbine Oil
Function: Ashless, Corrosion Inhibitor, Rust Inhibitor
Chemical Composition: Dodecenylsucciinic acid reaction product
Physical State/Color: Liquid/Ambor
Density @ 15.6°C Mg/m³ (lb/gal): 0.96 (8.0) @ 25°C
Viscosity @ 100°C mm²/s: 19
Flash Point (PMCC), °C: 165
Solubility: Soluble in petroleum lubricant bases.
Use Concentration, % mass: 0.05 - 0.25

Typical Uses: VANLUBE® RI-A is an oil-soluble rust inhibitor recommended for steam turbine oils, circulating oils and hydraulic oils. It is used in industrial gear oils with extreme pressure additives, levels of approximately 0.25% are recommended. VANLUBE RI-A is most effective in greases when used with a sulfonate such as VANLUBE RI-BA in a 50/50 ratio.

NSF® Certified HX-2, 139738
VANLUBE RI-BSN  
Lubricant Additive

**Application:** Gear Oil, Grease, Hydraulic Oil, Metal Working Fluid, Rust Preventive, Turbine Oil  
**Function:** Corrosion Inhibitor, Rust Inhibitors, Demulsifier  
**Chemical Composition:** Neutral barium dinonylnaphthalene sulfonate in light mineral oil  
**Physical State/Color:** Liquid/Dark Brown  
**Density @ 15.6°C Mg/m³ (lb/gal):** 1.01 (8.4) @ 20°C  
**Viscosity @ 100°C mm²/s:** 65.0  
**Flash Point (PMCC), °C:** >165 (COC)  
**Solubility:** Soluble in petroleum and synthetic lubricant bases. Insoluble in water.  
**Use Concentration, % mass:** 0.005 - 10.0  
**Typical Uses:** VANLUBE® RI-BSN is an effective general purpose rust inhibitor recommended for use where excellent rust inhibition and water resistance are needed. It can be used in industrial lubricants operating in the presence of moisture such as paper machine oils, rock drill oils, turbine, hydraulic and circulating oils. It can also be used as rust inhibitor in lubricating greases and as rust preventive for metal parts from metalworking processes.

VANLUBE RI-CSN  
Lubricant Additive

**Application:** Gear Oil, Grease, Hydraulic oil, Metal Working Fluid, Rust Preventive, Turbine Oil  
**Function:** Corrosion Inhibitor, Rust Inhibitor, Demulsifier  
**Chemical Composition:** Neutral calcium dinonylnaphthalene sulfonate in light mineral oil  
**Physical State/Color:** Liquid/Dark Brown  
**Density @ 15.6°C Mg/m³ (lb/gal):** 0.980  
**Viscosity @ 100°C mm²/s:** 125  
**Flash Point (PMCC), °C:** >165 (COC)  
**Solubility:** Soluble in petroleum and synthetic lubricant bases. Insoluble in water.  
**Use Concentration, % mass:** 0.1 - 20.0  
**Typical Uses:** VANLUBE® RI-CSN is an effective general purpose rust inhibitor recommended for use where excellent rust inhibition and water resistance are needed. It can be used in industrial lubricants operating in the presence of moisture such as paper machine oils, rock drill oils, turbine hydraulic and circulating oils. It can also be used as rust inhibitor in lubricating greases and as rust preventive for metal parts from metalworking processes.

VANLUBE® RI-G  
Lubricant Additive

**Application:** Gear Oil, Grease, Hydraulic Oil, Rust Preventive  
**Function:** Ashless, Corrosion Inhibitor, Rust Inhibitor  
**Chemical Composition:** Fatty acid derivative of 4,5-dihydro-1H-imidazole  
**Physical State/Color:** Liquid/Amber  
**Density @ 15.6°C Mg/m³ (lb/gal):** 0.94 (7.8)  
**Viscosity @ 100°C mm²/s:** 117  
**Flash Point (PMCC), °C:** 271  
**Solubility:** Soluble in petroleum lubricant bases. Insoluble in water.  
**Use Concentration, % mass:** 0.25 - 0.50  
**Typical Uses:** VANLUBE® RI-G was specifically designed to provide excellent rust inhibition for greases. It is compatible with other VANLUBE extreme pressure, antioxidant and antiwear additives.
VANLUBE® TK-100
Lubricant Additive

**Application:** Gear Oil, Grease, Metalworking, Rust Preventive
**Function:** Tackifier
**Chemical Composition:** Solution of a copolymer of ethylene and propylene
**Physical State/Color:** Liquid/Amber

- **Density @ 15.6°C Mg/m³ (lb/gal):** 0.89
- **Viscosity @ 100°C mm²/s:** 4500
- **Flash Point (PMCC), °C:** >160 (COC)
- **Solubility:** Soluble in petroleum and synthetic lubricant bases. Insoluble in water.

**Use Concentration, % mass:** 0.5 - 5.0

**Typical Uses:** VANLUBE® TK-100 is used to provide adherence in way oils, chain lubricants and greases. It provides excellent aerosol resistance in pneumatic system lubricants.

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VANLUBE® TK-200
Lubricant Additive

**Application:** Grease, Industrial Slide-way, Chain Oils, Gear Oils, Process Oil, Metal Working Fluid (Demisting)
**Function:** Oil and Grease Tackifier
**Chemical Composition:** Polyisobutylene in a process oil
**Physical State/Color:** Liquid/Pale Yellow

- **Density @ 15.6°C Mg/m³ (lb/gal):** 0.9
- **Viscosity @ 100°C mm²/s:** 2400
- **Flash Point (PMCC), °C:** >160
- **Solubility:** Soluble in petroleum and synthetic base stocks.

**Use Concentration, % mass:** 0.25 - 1%

**Typical Uses:** VANLUBE® TK-200 is a high molecular weight, low viscosity polyisobutylene (PIB) polymer in a process oil used to hold a grease or an industrial fluid on to the metal surfaces that needs to be lubricated and protected. A tackifier can also be used as an antimumisting additive for metal working fluids or other industrial applications. This material can be used in cold or warm weather climates.
**VANLUBE TK-223**
Lubricant Additive

**Application:** Grease, Industrial Slideway, Chain Oils, Gear Oils, Process Oil, Metal Working Fluid (Demisting)

**Function:** Oil and Grease Tackifier

**Chemical Composition:** Polyisobutylene in a process oil

**Physical State/Color:** Liquid/Pale Yellow

**Density @ 15.6°C Mg/m³ (lb/gal):** 0.9

**Viscosity @ 100°C mm²/s:** 7300

**Flash Point (PMCC), °C:** >160

**Solubility:** Soluble in petroleum and synthetic base stocks.

**Use Concentration, % mass:** 0.15 - 1%

**Typical Uses:** VANLUBE® TK-223 is a high molecular weight, high viscosity polyisobutylene (PIB) polymer in a process oil used to hold a grease or an industrial fluid on to the metal surfaces that need to be lubricated and protected. A tackifier can also be used as an antimisting additive for metal working fluid or other industrial applications. This material should only be used in warm weather climates.

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**VANLUBE W-324**
Lubricant Additive

**Application:** Engine Oils, Gear Oils, Grease, Synthetic Lubricants

**Function:** Antiwear, Antioxidant and high temperature Friction Reducer

**Chemical Composition:** Dialkylammonium Tungstate

**Physical State/Color:** Liquid/Amber to Black

**Viscosity @ 100°C mm²/s:** 11.6

**Flash Point (PMCC), °C:** >140

**Solubility:** Only soluble in lubricants using dispersants. Insoluble in water.

**Use Concentration, % mass:** 0.01 - 0.5

**Typical Uses:** VANLUBE® W 324 is a liquid additive that enhances the antioxidant, antiwear and friction properties of greases, engine oils and other lubricating oils.

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**VANLUBE® 73**
Lubricant Additive

**Application:** Compressor Oil, Engine Oil, Gear Oil, Grease, Synthetic Lube

**Function:** Antioxidant, Antiwear/Antiscuff, Friction Reducer, Extreme Pressure

**Chemical Composition:** Antimony tris(dialkyldithiocarbamate) in oil

**Physical State/Color:** Clear to Hazy Liquid/Dark Amber

**Density @ 15.6°C Mg/m³ (lb/gal):** 1.03 (8.6)

**Viscosity @ 100°C mm²/s:** 11

**Flash Point (PMCC), °C:** 171

**Solubility:** Soluble in petroleum and synthetic lubricant bases. Insoluble in water.

**Use Concentration, % mass:** 0.1 - 1.0 as antioxidant, 2.0 - 5.0 as extreme pressure agent.

**Typical Uses:** VANLUBE® 73 is one of the most versatile of the dithiocarbamate additives. It has excellent antiwear, extreme pressure and antioxidant properties. It is used as an antiwear additive, a bearing corrosion inhibitor in motor oils, gas engine oil, compressor oils, etc. It is used in lubricating greases of all types as an antioxidant, antiwear and extreme pressure additive.

NSF® Certified HX-2,137553

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### VANLUBE 73 Super Plus

**Lubricant Additive**

**Application:** Gear Oil, Grease  
**Function:** Antioxidant, Antiwear/Antiscuff, Extreme Pressure  
**Chemical Composition:** Proprietary blend of dialkyldithiocarbamates  
**Physical State/Color:** Liquid/Amber  
**Density @ 15.6°C Mg/m³ (lb/gal):** 1.0987 @ 25°C  
**Viscosity @ 100°C mm²/s:** 33.34  
**Flash Point (PMCC), °C:** >118  
**Solubility:** Soluble in petroleum and synthetic lubricant bases. Insoluble in water.  
**Use Concentration, % mass:** 0.5 - 4.0  
**Typical Uses:** VANLUBE® 73 Super Plus is a proprietary mixture of dialkyldithiocarbamates. Based on equivalent antimony content, the load-carrying capability of VANLUBE 73 Super Plus is superior to that of antimony dialkyldithiocarbamate (SDDC), and comparable to that of combinations of SDDC and sulfurized olefin. As an antioxidant, VANLUBE 73 Super Plus outperforms both SDDC and SDDC/sulfurized olefin and, unlike sulfurized olefin, it does not lower the dropping point of lithium complex grease. VANLUBE 73 Super Plus does not have the pungent order of sulfurized olefin.

### VANLUBE 81

**Antioxidant**

**Application:** Auto Transmission Fluid, Compressor Oil, Engine Oil, Grease, Synthetic Lube, Turbine Oil  
**Function:** Ashless, High Temperature, Antioxidant  
**Chemical Composition:** p,p'-dioctyldiphenylamine  
**Physical State/Color:** Powder/Off White  
**Density @ 15.6°C Mg/m³ (lb/gal):** 1.01  
**Solubility:** Soluble in petroleum and synthetic lubricant bases. Insoluble in water.  
**Use Concentration, % mass:** 0.5 - 2.0  
**Typical Uses:** VANLUBE® 81 is similar chemically to VANLUBE SS but is a better high temperature oxidation inhibitor because of its high purity and high p,p'-dioctyldiphenylamine content. VANLUBE 81 can be used in a variety of petroleum and synthetic lubricants where an ashless oxidation inhibitor with good high temperature properties is needed. Effective in silane, siloxane, silicone and diester fluids at concentrations of 0.5 to 2.0% and temperature of 400 to 500°F. In lubricating greases, VANLUBE 81 is effective in both oxidation pressure vessel tests and in high speed spindle tests. Siloxane greases containing 2% VANLUBE 81 have given outstanding results in bearing performance tests at 350°F. Has a good color stability. Widely used as a high temperature antioxidant in jet engine oils.  
**NSF® Certified HX-1, 143815**

### VANLUBE® 289

**Lubricant Additive**

**Application:** Auto Transmission Fluid, Compressor Oil, Engine Oil, Gear Oil, Grease, Metalworking  
**Function:** Ashless, Antiwear/Antiscuff, Friction Reducer  
**Chemical Composition:** Borate ester  
**Physical State/Color:** Liquid/Yellowish  
**Density @ 15.6°C Mg/m³ (lb/gal):** 0.99  
**Viscosity @ 100°C mm²/s:** 22.3  
**Flash Point (PMCC), °C:** 191  
**Solubility:** Soluble in petroleum and synthetic lubricant bases. Insoluble in water.  
**Use Concentration, % mass:** 0.5 - 1.0  
**Typical Uses:** VANLUBE® 289 is an oil-soluble borate ester that is an effective antiwear additive, by itself or in synergistic combinations with other antiwear/extreme pressure additives such as dithiophosphates, dithiocarbamates and alkyl thiadiazoles. It contains no phosphorous, sulfur or metals. It is therefore useful in eliminating and/or reducing levels of these elements in lubricants and greases while maintaining cost-effective performance.
### VANLUBE 289HD

**Application:** Heavy Duty, Engine Oil, Auto Transmission Fluid, Compressor Oil, Gear Oil, Grease, Metalworking  
**Function:** Ashless, Antiwear/Antiscuff, Friction Reducer  
**Chemical Composition:** Borate ester  
**Physical State/Color:** Liquid/Gold to Amber  
**Density @ 15.6°C Mg/m³ (lb/gal):** 0.968  
**Flash Point (MPCC), °C:** 160  
**Solubility:** Soluble in petroleum and synthetic lubricant bases. Insoluble in water.  
**Use Concentration, % mass:** 0.5 - 1.0  
**Typical Uses:** VANLUBE® 289HD is specially formulated for heavy duty engine oils with enhanced metal corrosion protection. VANLUBE 289HD is an oil-soluble borate ester that is an effective antiwear additive, by itself or in synergistic combinations with other antiwear/extreme pressure additives such as dithiophosphates, dithiocarbamates and alkyl thiadiazoles. It contains no phosphorous, sulfur or metals. It is therefore useful in eliminating and/or reducing levels of these elements in lubricants and greases while maintaining cost-effective performance.

### VANLUBE 407

**Application:** Industrial Oil, Turbine Oil, Compressor Oil, Greases, Food Grade HX-1 Lubricants  
**Function:** High Temperature, Antioxidant  
**Chemical Composition:** Blend of octylated phenyl-alpha-naphthylamine with proprietary antioxidants  
**Physical State/Color:** Liquid/Clear Light Amber  
**Density @ 25°C Mg/m³ (lb/gal):** 1.02  
**Viscosity @ 100°C mm²/s:** 23.7  
**Flash Point (CCCFP), °C:** 212  
**Solubility:** Soluble in meneral oils, polyalkylene glycols, synthetics esters and most non-polar synthetic base oils.  
**Use Concentration, % mass:**  
**Typical Uses:** VANLUBE® 407 is a liquid blend of octylated phenyl-alpha-naphthylamine with other proprietary antioxidants. This unique combination provides exceptional antioxidant performance in PDSC (ASTM D6186) and RPVOT (ASTM D2272) at very low treat rates. VANLUBE 407 is approved by NSF for use in USDA HX-1 food grade lubricants with incidental food contact. NSF® Certified HX-1, 152988

### VANLUBE® 601

**Application:** Fuel, Gear Oil, Grease, Hydraulic Oil, Metalworking, Synthetic Lube, Turbine Oil  
**Function:** Ashless, Antioxidant, Corrosion Inhibitor, Metal Deactivator  
**Chemical Composition:** Heterocyclic sulfur-nitrogen compound  
**Physical State/Color:** Liquid/Dark Amber  
**Density @ 15.6°C Mg/m³ (lb/gal):** 0.98 (8.1)  
**Viscosity @ 100°C mm²/s:** 10.5  
**Flash Point (PMCC), °C:** 122  
**Solubility:** Soluble in petroleum and synthetic lubricant bases. Insoluble in water.  
**Use Concentration, % mass:** 0.02 - 1.0  
**Typical Uses:** VANLUBE® 601 is a copper passivator, corrosion and rust inhibitor of the film-forming type. It exhibits synergistic properties with various metal organic extreme pressure additives such as the dithiocarbamates. Used in petroleum fuels and solvents at concentration of 1 to 10 pounds per 1,000 barrels to prevent copper stain and corrosion. Used in petroleum base oils and greases and in synthetic base greases at concentrations of 0.02 to 0.5% to protect copper. VANLUBE 601 has color stabilizing properties in oils and greases stored at elevated temperatures. It is useful EP/synergist with a variety of extreme pressure and antiwear additives.
**VANLUBE® 672E**
Lubricant Additive

**Application:** Gear Oil, Grease, Metalworking, Synthetic Lube

**Function:** Ashless, Antioxidant, Antiwear/Antiscuff, Extreme Pressure

**Chemical Composition:** Amine phosphate

**Physical State/Color:** Viscous Liquid/Light Amber

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density @ 15.6°C Mg/m³ (lb/gal)</td>
<td>0.98 (8.5)</td>
</tr>
<tr>
<td>Viscosity @ 100°C mm²/s</td>
<td>250</td>
</tr>
<tr>
<td>Flash Point (PMCC), °C</td>
<td>113</td>
</tr>
</tbody>
</table>

**Solubility:** Soluble in water, petroleum and synthetic lubricant bases. Insoluble in water.

**Use Concentration, % mass:** 1.0 - 3.0

**Typical Uses:** VANLUBE® 672E is an extreme pressure and antiwear additive for industrial lubricants, including lubricating oils, greases and synthetic fluids. Used as an extreme pressure and antiwear additive in various metalworking lubricants such as drawing, stamping and forming compounds. Improves extreme pressure performance of conventional extreme pressure materials such as sulfurized olefins, fatty oils, chlorinated paraffins, metal dithiocarbamates and phosphorodithioates. Effective in low concentrations as an antiwear additive in synthetic lubricants.

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**VANLUBE® 622**
Lubricant Additive

**Application:** Engine Oil, Gear Oil, Grease, Synthetic Lube

**Function:** Antioxidant, Antiwear/Antiscuff, Friction Reducer, Extreme Pressure

**Chemical Composition:** Antimony o,o-dialkylphosphorodithioate in oil

**Physical State/Color:** Clear to Slightly Hazy Liquid/Amber

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density @ 15.6°C Mg/m³ (lb/gal)</td>
<td>1.20 (10.0)</td>
</tr>
<tr>
<td>Viscosity @ 100°C mm²/s</td>
<td>5</td>
</tr>
<tr>
<td>Flash Point (PMCC), °C</td>
<td>150</td>
</tr>
</tbody>
</table>

**Solubility:** Soluble in petroleum and synthetic lubricant bases. Insoluble in water.

**Use Concentration, % mass:** 0.5 - 3.0

**Typical Uses:** VANLUBE® 622 is an antiwear and extreme pressure additive for steel mill and other industrial gear oils. VANLUBE 622 has outstanding extreme pressure and antiwear properties in a variety of base lubricants. It will give unusually high Timken®, Falex® and 4-Ball extreme pressure values at economical concentrations of 1 to 3%. It can also be used as an extreme pressure and antiwear additive in automotive gear oils.

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**VANLUBE® 601E**
Lubricant Additive

**Application:** Fuel, Gear Oil, Grease, Hydraulic Oil, Metalworking, Synthetic Lube, Turbine Oil

**Function:** Antioxidant, Corrosion Inhibitor

**Chemical Composition:** Heterocyclic sulfur-nitrogen compound

**Physical State/Color:** Liquid/Dark Amber

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density @ 15.6°C Mg/m³ (lb/gal)</td>
<td>0.98 (8.1)</td>
</tr>
<tr>
<td>Viscosity @ 100°C mm²/s</td>
<td>7</td>
</tr>
<tr>
<td>Flash Point (PMCC), °C</td>
<td>157</td>
</tr>
</tbody>
</table>

**Solubility:** Soluble in petroleum and synthetic lubricant bases. Insoluble in water.

**Use Concentration, % mass:** 0.02 - 1.0

**Typical Uses:** VANLUBE® 601E is a copper passivator, corrosion and rust inhibitor of the film-forming type. It exhibits synergistic properties with various metal organic extreme pressure additives such as the dithiocarbamates. Used in petroleum fuels and solvents at concentrations to 1 to 10 pounds per 1,00 barrels to prevent copper stain and corrosion. Used in petroleum base oils and greases and in synthetic base greases at concentrations of 0.02 to 0.5% to protect copper. VANLUBE 601E has shown color stabilizing properties in oils and greases stored at elevated temperatures. It is a useful extreme pressure/synergist with a variety of extreme pressure and antiwear additives.
**VANLUBE 692E**

**Application:** Gear Oil, Grease, Metalworking, Synthetic Lube

**Function:** Ashless, Antioxidant, Antiwear/Antiscuff, Extreme Pressure

**Chemical Composition:** Aromatic amine phosphate

**Physical State/Color:** Viscous Liquid/Dark Amber

- **Density @ 15.6°C Mg/m³ (lb/gal):** 0.99 (8.2)
- **Viscosity @ 100°C mm²/s:** 53
- **Flash Point (PMCC), °C:** ≥65

**Solubility:** Soluble in petroleum and synthetic lubricant bases. Insoluble in water.

**Use Concentration, % mass:** 1.0 - 3.0

**Typical Uses:** VANLUBE® 692E is used in nonmetallic industrial gear oils to give high load carrying properties. Extreme pressure and antiwear additive for lubricants based on petroleum oils and synthetics. VANLUBE 692E enhances the extreme pressure properties of sulfurized olefins, chlorinated paraffins, dithiocarbamates and phosphorodithioates.

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**VANLUBE 704S**

**Application:** Gear Oil, Grease, Hydraulic Oil, Metalworking, Synthetic Lube, Turbine Oil

**Function:** Corrosion Inhibitor, Demulsifier, Metal Deactivator, Rust Inhibitor

**Chemical Composition:** Barium sulfonate blend

**Physical State/Color:** Viscous Liquid/Dark Amber

- **Density @ 15.6°C Mg/m³ (lb/gal):** 1.03 (8.5)
- **Viscosity @ 100°C mm²/s:** 72
- **Flash Point (PMCC), °C:** 188

**Solubility:** Soluble in petroleum and synthetic lubricant bases. Insoluble in water.

**Use Concentration, % mass:** 0.05 - 0.25

**Typical Uses:** VANLUBE® 704S is used in petroleum and synthetic lubricants as a multifunctional rust and corrosion inhibitor. VANLUBE 704S is a synergistic blend of polar additives capable of forming films or complexes on metal surfaces, particularly copper and copper alloys that might be exposed to free sulfur of active sulfur compounds. It is used in a variety of lubricants based on petroleum oils or synthetics. Economical concentrations enhance antioxidants by passivating catalytic metal surfaces in the lubricant system.

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**VANLUBE® 719**

**Application:** Gear Oil, Metalworking, Synthetic Lube

**Function:** Antioxidant, Antiwear/Antiscuff, Extreme pressure

**Chemical Composition:** Amine phosphate package

**Physical State/Color:** Liquid/Dark Amber

- **Density @ 15.6°C Mg/m³ (lb/gal):** 0.99 (8.2)
- **Viscosity @ 100°C mm²/s:** 48
- **Flash Point (PMCC), °C:** 85

**Solubility:** Soluble in petroleum and synthetic lubricant bases. Insoluble in water.

**Use Concentration, % mass:** 1.0 - 4.0

**Typical Uses:** VANLUBE® 719 was developed primarily for steel mill and similar industrial gear oils. It gives good extreme pressure and antiwear properties, good high temperature stability, and good demulsibility. VANLUBE 719 at a concentration range of 2 to 3% will meet the requirements of most steel mill gear oil specifications. It is also used in 2-cycle engine oils.

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### VANLUBE 727

**Application:** Auto Transmission Fluid, Engine Oil, Grease, Hydraulic Oil, Metalworking, Synthetic Lube  
**Function:** Ashless, Antioxidant, Antiwear/Antiscuff  
**Chemical Composition:** Organosulfur-phosphorus compound  
**Physical State/Color:** Liquid/Light Amber  
**Density @ 15.6°C Mg/m³ (lb/gal):** 1.01 (8.4)  
**Viscosity @ 100°C mm²/s:** 2.6  
**Flash Point (PMCC), °C:** 100  
**Solubility:** Soluble in petroleum and synthetic lubricant bases. Insoluble in water.  
**Use Concentration, % mass:** 1.0 - 2.0  
**Typical Uses:** VANLUBE® 727 is a versatile additive for various types of automotive and industrial lubricating oils. VANLUBE 727 functions as an antiwear agent and antioxidant. Its nonmetallic nature makes it of interest for ashless or low ash applications. Some suggested applications are: automotive engine oils, railroad diesel oils, compressor oils, gas engine oils, antiwear hydraulic and turbine oils, and various types of industrial oils. Bench tests indicate that the performance of VANLUBE 727 is competitive with that of commonly used zinc dithiophosphates. One percent in SAE 90 gear oil gives a 12-stage pass in the FZG test.

### VANLUBE 739

**Application:** Auto Transmission Fluid, Compressor Oil, Engine Oil, Gear Oil, Grease, Hydraulic Oil, Turbine Oil  
**Function:** Ashless, Corrosion Inhibitor, Rust Inhibitor  
**Chemical Composition:** Ashless rust inhibitor in oil  
**Physical State/Color:** Liquid/Light Amber  
**Density @ 15.6°C Mg/m³ (lb/gal):** 0.92 (7.7)  
**Viscosity @ 100°C mm²/s:** 5  
**Flash Point (PMCC), °C:** 130  
**Solubility:** Soluble in petroleum and synthetic lubricant bases. Insoluble in water.  
**Use Concentration, % mass:** 0.05 - 0.5  
**Typical Uses:** VANLUBE® 739 was designed to improve rust protection in lube oils and greases.

### VANLUBE® 829

**Application:** Grease, Synthetic Lube  
**Function:** Ashless, High Temperature, Antioxidant, Antiwear/Antiscuff, Friction Reducer, Corrosion Inhibitor, Extreme Pressure, Metal Deactivator  
**Chemical Composition:** 5,5-dithiobis(1,3,4-thiadiazole-2(3H)-thione)  
**Physical State/Color:** Powder/Yellow  
**Density @ 15.6°C Mg/m³ (lb/gal):** 2.09  
**Solubility:** Dispersible in grease.  
**Use Concentration, % mass:** 1.0 - 3.0  
**Typical Uses:** VANLUBE® 829 possesses excellent extreme pressure properties when dispersed in various greases. It also functions as an antwear agent and an antioxidant. VANLUBE 829 should be used in greases in applications where extreme pressures prevail, such as steel mills and heavy equipment lubrication.  
**NSF® Certified HX-2,138302**
**VANLUBE® 871**

**Antioxidant**

**Application:** Engine Oil, Grease  
**Function:** Ashless, Antioxidant, Antiwear/Antiscuff  
**Chemical Composition:** 2,5-dimercapto-1,3,4-thiadiazole alkyl polycarboxylate  
**Physical State/Color:** Liquid/Amber  
**Density @ 15.6°C Mg/m³ (lb/gal):** 1.10 (9.3)  
**Viscosity @ 100°C mm²/s:** 19.6  
**Flash Point (PMCC), °C:** 178  
**Solubility:** Soluble in petroleum and synthetic lubricant bases. Insoluble in water.  
**Use Concentration, % mass:** 0.5 - 2.0  
**Typical Uses:** VANLUBE® 871 is a liquid ashless antioxidant/antiwear agent. Possible uses include both gasoline and diesel engine oil formulations to improve existing additive packages.

**VANLUBE® 887**

**Antioxidant**

**Application:** Auto Transmission Fluid, Compressor Oil, Engine Oil, Gear Oil, Grease, Hydraulic Oil, Turbine Oil  
**Function:** Ashless, High Temperature, Antioxidant  
**Chemical Composition:** Tolutriazole compound in oil  
**Physical State/Color:** Liquid/Amber  
**Density @ 15.6°C Mg/m³ (lb/gal):** 1.01 (8.36)  
**Viscosity @ 100°C mm²/s:** 17  
**Flash Point (PMCC), °C:** 146  
**Solubility:** Soluble in petroleum and synthetic lubricant bases. Insoluble in water.  
**Use Concentration, % mass:** 0.5 - 1.0  
**Typical Uses:** VANLUBE® 887 is a liquid ashless antioxidant. It is most effective as an antioxidant synergist with mixtures of hindered phenols and /or ashless dithiocarbamates such as VANLUBE 7723. VANLUBE 887 possesses excellent high temperature stability. Combined with VANLUBE 7723 and a suitable base stock, it will pass the MAG Cincinnati Mchine Thermal Stability Test, Procedure A.

**VANLUBE 887E**

**Antioxidant**

**Application:** Auto Transmission Fluid, Compressor Oil, Engine Oil, Gear Oil, Grease, Hydraulic Oil, Synthetic Lube, Turbine Oil  
**Function:** Ashless, High Temperature, Antioxidant  
**Chemical Composition:** Tolutriazole compound in oil  
**Physical State/Color:** Liquid/Amber  
**Density @ 15.6°C Mg/m³ (lb/gal):** 1.00 (8.36)  
**Viscosity @ 100°C mm²/s:** 17  
**Flash Point (PMCC), °C:** 146  
**Solubility:** Soluble in petroleum and synthetic lubricant bases. Insoluble in water.  
**Use Concentration, % mass:** 0.5 - 2.0  
**Typical Uses:** VANLUBE® 887E is a liquid ashless antioxidant. It is most effective as an antioxidant synergist with mixtures of hindered phenols and /or ashless dithiocarbamates such as VANLUBE 7723. VANLUBE 887E possesses excellent high temperature stability.
**VANLUBE 887FG**  
*Antioxidant*

**Application:** Auto Transmission Fluid, Compressor Oil, Engine Oil, Gear Oil, Grease, Hydraulic Oil, Synthetic Lube, Turbine Oil  
**Function:** Ashless, High Temperature, Antioxidant  
**Chemical Composition:** Tolutriazole compound in ester  
**Physical State/Color:** Liquid/Light Amber  
**Density @ 15.6°C Mg/m³ (lb/gal):** 1.01 (8.4)  
**Viscosity @ 100°C mm²/s:** 20  
**Flash Point (PMCC), °C:** 180  
**Solubility:** Soluble in petroleum and synthetic lubricant bases. Insoluble in water.  
**Use Concentration, % mass:** 0.5 - 2.0  
**Typical Uses:** VANLUBE® 887FG is a liquid ashless antioxidant. It is most effective as an antioxidant synergist with mixtures of hindered phenols and/or ashless dithiocarbamates such as VANLUBE 7723. VANLUBE 887FG possesses excellent high temperature stability.  
**NSF® Certified HX-1, 150690**

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**VANLUBE 961**  
*Lubricant Additive*

**Application:** Auto Transmission Fluid, Compressor Oil, Engine Oil, Gear Oil, Grease, Hydraulic Oil, Synthetic Lube, Turbine Oil  
**Function:** Ashless, Antioxidant  
**Chemical Composition:** Mixed octylated and butylated diphenylamines  
**Physical State/Color:** Liquid/Light Amber  
**Density @ 15.6°C Mg/m³ (lb/gal):** 0.98 (8.2)  
**Viscosity @ 100°C mm²/s:** 9.9  
**Flash Point (PMCC), °C:** 190  
**Solubility:** Soluble in petroleum and synthetic lubricant bases. Insoluble in water.  
**Use Concentration, % mass:** 0.5 - 1.0  
**Typical Uses:** VANLUBE® 961 is a liquid ashless antioxidant for use in oils and greases of various types. It may be used in industrial lubricants, including compressor, hydraulic, turbine, gas engine and circulating oils. VANLUBE 961 may be used as an ashless antioxidant in all types of crankcase oils.  
**NSF® Certified HX-1, HX-2, 135573**

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**VANLUBE 972M**  
*Lubricant Additive*

**Application:** Grease, Synthetic Lube  
**Function:** Ashless, Antiwear/Antiscuff, Extreme Pressure  
**Chemical Composition:** Thiadiazole derivative in polyalkylene glycols  
**Physical State/Color:** Liquid/Amber  
**Density @ 15.6°C Mg/m³ (lb/gal):** 1.24 (10.2)  
**Viscosity @ 100°C mm²/s:** 6.0  
**Flash Point (PMCC), °C:** 110  
**Solubility:** Soluble PAG fluids. Insoluble petroleum lubricant bases and water.  
**Use Concentration, % mass:** 0.5 - 3.0  
**Typical Uses:** VANLUBE® 972M, a thiadiazole derivative in polyalkylene glycol, is an ashless extreme pressure additive recommended for use in grease and some polyalkylene glycols (PAG) and some synthetic esters. The advantages this product offers are that it contains no metals, is easily handled, is readily biodegradable, is a cost effective alternative to other metal-containing EP additives and does not have the strong sulfur odor that is typical of the other sulfur EP additives.
### VANLUBE® 972 NT

**Lubricant Additive**

<table>
<thead>
<tr>
<th>Application:</th>
<th>Grease, Synthetic Lube</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function:</td>
<td>Ashless, Extreme Pressure, Antiwear / Antiscuff</td>
</tr>
<tr>
<td>Chemical Composition:</td>
<td>Thiadiazole derivative in polyalkylene glycols</td>
</tr>
<tr>
<td>Physical State/Color:</td>
<td>Liquid/Dark Amber</td>
</tr>
<tr>
<td>Density @ 15.6°C Mg/m³ (lb/gal):</td>
<td>1.30 (10.8)</td>
</tr>
<tr>
<td>Viscosity @ 100°C mm²/s:</td>
<td>20</td>
</tr>
<tr>
<td>Flash Point (PMCC), °C:</td>
<td>188</td>
</tr>
<tr>
<td>Solubility:</td>
<td>Soluble in PAG fluids. Insoluble in petroleum lubricant bases and water.</td>
</tr>
<tr>
<td>Use Concentration, % mass:</td>
<td>0.5 - 3.0</td>
</tr>
</tbody>
</table>

**Typical Uses:** VANLUBE® 972 NT is a thiadiazole in a polyalkylene glycol. It is an ashless extreme pressure additive recommended for use in grease, some polyalkylene glycols, and some synthetic esters. Advantages of VANLUBE 972 NT are that it contains no metals, is easily handled, and is a cost effective alternative to other metal-containing EP additives. It does not have the strong sulfur odor that is typical of other sulfur EP additives. This product is HAPs (Hazardous Air Pollutants) free.

### VANLUBE 981

**Antioxidant**

<table>
<thead>
<tr>
<th>Application:</th>
<th>Compressor Oil, Gear Oil, Grease, Hydraulic Oil, Synthetic Lube, Turbine Oil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function:</td>
<td>Ashless, Antioxidant</td>
</tr>
<tr>
<td>Chemical Composition:</td>
<td>dithiocarbamate derivative</td>
</tr>
<tr>
<td>Physical State/Color:</td>
<td>Liquid/Golden Yellow to Amber</td>
</tr>
<tr>
<td>Density @ 15.6°C Mg/m³ (lb/gal):</td>
<td>1.03 (8.6)</td>
</tr>
<tr>
<td>Viscosity @ 100°C mm²/s:</td>
<td>6</td>
</tr>
<tr>
<td>Flash Point (PMCC), °C:</td>
<td>120</td>
</tr>
<tr>
<td>Solubility:</td>
<td>Soluble in petroleum and synthetic lubricant bases. Insoluble in water.</td>
</tr>
<tr>
<td>Use Concentration, % mass:</td>
<td>0.1 - 1.0 as an antioxidant</td>
</tr>
</tbody>
</table>

**Typical Uses:** VANLUBE® 981 is an ashless antioxidant in lubricants.

### VANLUBE 996E

**Antioxidant**

<table>
<thead>
<tr>
<th>Application:</th>
<th>Auto Transmission Fluid, Compressor Oil, Engine Oil, Gear Oil, Grease, Hydraulic Oil, Metalworking, Synthetic Lube, Turbine Oil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function:</td>
<td>Ashless, High Temperature, Antioxidant, Corrosion Inhibitor</td>
</tr>
<tr>
<td>Chemical Composition:</td>
<td>Methylene bis (dibutyl dithiocarbamate) and tolutriazole derivative</td>
</tr>
<tr>
<td>Physical State/Color:</td>
<td>Liquid/Amber</td>
</tr>
<tr>
<td>Density @ 15.6°C Mg/m³ (lb/gal):</td>
<td>1.06 (8.8)</td>
</tr>
<tr>
<td>Viscosity @ 100°C mm²/s:</td>
<td>16.4</td>
</tr>
<tr>
<td>Flash Point (PMCC), °C:</td>
<td>191</td>
</tr>
<tr>
<td>Solubility:</td>
<td>Soluble in petroleum and synthetic lubricant bases. Insoluble in water.</td>
</tr>
<tr>
<td>Use Concentration, % mass:</td>
<td>0.1 - 1.0 as antioxidant; 1-4 as extreme pressure agent</td>
</tr>
</tbody>
</table>

**Typical Uses:** VANLUBE® 996E is a liquid ashless antioxidant that finds application in petroleum lubricants of all types. It possesses excellent high temperature stability and is noncorrosive despite having high sulfur content. VANLUBE 996E also exhibits extreme pressure performance alone and in combination with other additives.
**VANLUBE® 0902**
Lubricant Additive

**Application:** Grease and Industrial Gear Oils  
**Function:** Multifunctional additive package for both greases and industrial gear oil.  
**Chemical Composition:** Metal-free multifunctional additive package, phosphorus containing sulfurized hydrocarbon  
**Physical State/Color:** Liquid/Light Amber  
**Density @ 15.6°C Mg/m³ (lb/gal):** 1.06 (8.8)  
**Viscosity @ 100°C mm²/s:** 10-30  
**Flash Point (PMCC), °C:** >90  
**Solubility:** Soluble in petroleum and synthetic lubricant bases. Insoluble in water.  
**Use Concentration, % mass:** 1.5 - 4.0  
**Typical Uses:** VANLUBE® 0902 is a multifunctional additive package recommended for use at 1.5 to 2.25 % in suitable base stocks to formulate industrial gear oils. It is also recommended for use at 3.0 to 4.0% to formulate high performance greases.

**VANLUBE 1202**
Lubricant Additive

**Application:** Engine Oils, Gear oil, Grease, Metal Working Fluids and Synthetic Lubricants  
**Function:** Antioxidant  
**Chemical Composition:** Alkylated PANA  
**Physical State/Color:** Solid, Powder/Yellow to Brown  
**Flash Point (PMCC), °C:** 186  
**Solubility:** Soluble in petroleum and synthetic lubricant base stocks. Insoluble in water.  
**Use Concentration, % mass:** 0.1 - 1.0  
**Typical Uses:** VANLUBE® 1202 is a solid ashless antioxidant for use in lubricating oils and greases of various types and is especially effective in engine oils and other high temperature applications.  
**NSF® Certified HX-1, 240617**

**VANLUBE 1305**
Lubricant Additive

**Application:** Passenger car motor oil performance booster  
**Function:** Friction Reducer, Improves Oxidation & Deposit Control  
**Chemical Composition:** Proprietary Blend  
**Physical State/Color:** Liquid/Brown  
**Density @ 25°C Mg/m³ (lb/gal):** 1.0  
**Viscosity @ 100°C mm²/s:** 230  
**Flash Point (CCCFP), °C:** 186  
**Solubility:** Soluble in fully formulated motor oil. Insoluble in water.  
**Use Concentration, % mass:** 1.0 - 3.5  
**Typical Uses:** VANLUBE® 1305 is a low ash and phosphorus free engine oil performance booster for enhanced friction reduction, improved oxidation and deposit control and supplemental anti-wear protection.
### VANLUBE® 7611M
Lubricant Additive

<table>
<thead>
<tr>
<th>Application:</th>
<th>Auto Transmission Fluid, Engine Oil, Grease, Hydraulic Oil, Metalworking, Synthetic Lube</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function:</td>
<td>Ashless, Antioxidant, Antiwear/Antiscuff</td>
</tr>
<tr>
<td>Chemical Composition:</td>
<td>Ashless phosphorodithioate</td>
</tr>
<tr>
<td>Physical State/Color:</td>
<td>Liquid/Light Amber</td>
</tr>
<tr>
<td>Density @ 15.6°C Mg/m³ (lb/gal):</td>
<td>1.08 (9.0)</td>
</tr>
<tr>
<td>Viscosity @ 100°C mm²/s:</td>
<td>2.54</td>
</tr>
<tr>
<td>Flash Point (PMCC), °C:</td>
<td>142</td>
</tr>
<tr>
<td>Solubility:</td>
<td>Soluble in petroleum and synthetic lubricant bases. Insoluble in water.</td>
</tr>
<tr>
<td>Use Concentration, % mass:</td>
<td>1.0 - 2.0</td>
</tr>
</tbody>
</table>

**Typical Uses:** VANLUBE® 7611M is an organic liquid additive containing sulfur and phosphorus. 4-Ball Wear tests show that VANLUBE 7611M, at a 20 kg load, performs equivalently to typical zinc dialkyldithiophosphates. At a 40 kg load it is superior to these products. VANLUBE 7611M will improve the antiwear properties of sulfurized extreme pressure additives. It is a useful component for extreme pressure/antiwear lubricant formulations and additive packages. VANLUBE 7611M does not contain metallic elements. Thus, it is applicable to ashless and low ash formulations. 

NSF® Certified HX-2, 136048

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### VANLUBE® 7723
Lubricant Additive

![Methylene bis(dibutyldithiocarbamate)](image)

<table>
<thead>
<tr>
<th>Application:</th>
<th>Compressor Oil, Gear Oil, Grease, Hydraulic Oil, Synthetic Lube, Turbine Oil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function:</td>
<td>Ashless, High Temperature, Antioxidant, Antiwear/Antiscuff, Friction Reducer, Extreme Pressure</td>
</tr>
<tr>
<td>Chemical Composition:</td>
<td>Methylene bis(dibutyldithiocarbamate)</td>
</tr>
<tr>
<td>Physical State/Color:</td>
<td>Liquid/Amber to Amber Green</td>
</tr>
<tr>
<td>Density @ 15.6°C Mg/m³ (lb/gal):</td>
<td>1.06 (8.8)</td>
</tr>
<tr>
<td>Viscosity @ 100°C mm²/s:</td>
<td>15</td>
</tr>
<tr>
<td>Flash Point (PMCC), °C:</td>
<td>177</td>
</tr>
<tr>
<td>Solubility:</td>
<td>Soluble in petroleum and synthetic lubricant bases. Insoluble in water.</td>
</tr>
<tr>
<td>Use Concentration, % mass:</td>
<td>0.1 - 1.0 as antioxidant; 2.0 - 4.0 as extreme pressure agent</td>
</tr>
</tbody>
</table>

**Typical Uses:** VANLUBE® 7723 is a general purpose, ashless antioxidant which should find application in petroleum lubricants of all types. It is effective at economical concentrations, readily soluble, and easy to blend. VANLUBE 7723 has been tested in a variety of base stocks commonly used in compounding turbine, hydraulic and circulating oils. In addition to being an effective antioxidant, VANLUBE 7723 also exhibits good extreme pressure performance alone and in combination with other additives. Useful as a component of additive packages.

NSF® Certified HX-1, HX-2, 136049

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### VANLUBE® 8610
Lubricant Additives

<table>
<thead>
<tr>
<th>Application:</th>
<th>Gear Oil, Grease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function:</td>
<td>Antioxidant, Antiwear/Antiscuff, Extreme Pressure</td>
</tr>
<tr>
<td>Chemical Composition:</td>
<td>Antimony dithiocarbamate/sulfurized olefin blend</td>
</tr>
<tr>
<td>Physical State/Color:</td>
<td>Liquid/Amber</td>
</tr>
<tr>
<td>Density @ 15.6°C Mg/m³ (lb/gal):</td>
<td>1.16 (9.42)</td>
</tr>
<tr>
<td>Viscosity @ 100°C mm²/s:</td>
<td>2.54</td>
</tr>
<tr>
<td>Flash Point (PMCC), °C:</td>
<td>100</td>
</tr>
<tr>
<td>Solubility:</td>
<td>Soluble in petroleum and synthetic lubricant bases. Insoluble in water.</td>
</tr>
<tr>
<td>Use Concentration, % mass:</td>
<td>1.25 - 2.0</td>
</tr>
</tbody>
</table>

**Typical Uses:** VANLUBE® 8610 is an extreme pressure/antioxidant useful for various lubricating oils and greases. Impressive Timken loads of 90 to 100 lbs. are achieved with 2% treatment levels. VANLUBE 8610 is compatible with other VANLUBE rust inhibitors/antioxidants and metal deactivators.
**VANLUBE® 8912E**

**Lubricant Additive**

**Application:** Gear Oil, Grease, Hydraulic Oil, Metalworking, Rust Preventive, Turbine Oil  
**Function:** Corrosion Inhibitor, Rust Inhibitor  
**Chemical Composition:** Calcium sulfonate  
**Physical State/Color:** Liquid/Dark Brown  
**Density @ 15.6°C Mg/m³ (lb/gal):** 0.97  
**Viscosity @ 100°C mm²/s:** 19  
**Flash Point (PMCC), °C:** 150 (COC)  
**Solubility:** Soluble in petroleum and synthetic lubricant bases. Insoluble in water.  
**Use Concentration, % mass:** 0.05 - 0.10  
**Typical Uses:** VANLUBE® 8912E is an oil-soluble calcium sulfonate with excellent rust-inhibiting and water-resistant properties.

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**VANLUBE 9123**

**Lubricant Additive**

**Application:** Gear Oil, Grease, Rust Preventive  
**Function:** Ashless, Antiwear/Antiscuff, Rust Inhibitor  
**Chemical Composition:** Amine phosphate  
**Physical State/Color:** Liquid/Amber  
**Density @ 15.6°C Mg/m³ (lb/gal):** 0.94 (7.8)  
**Viscosity @ 100°C mm²/s:** 24  
**Flash Point (PMCC), °C:** 96  
**Solubility:** Soluble in petroleum and synthetic lubricant bases. Insoluble in water.  
**Use Concentration, % mass:** 0.10 - 1.0  
**Typical Uses:** VANLUBE® 9123 is an excellent antiwear additive and rust inhibitor in a wide range of industrial oils and lubricating greases.  
**NSF® Certified HX-1, HX-2,135575**

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**VANLUBE 9317**

**Antioxidant**

**Application:** Synthetic Lube  
**Function:** High Temperature, Antioxidant  
**Chemical Composition:** Organic amine compounds in a synthetic ester  
**Physical State/Color:** Liquid/Dark Brown  
**Density @ 15.6°C Mg/m³ (lb/gal):** 0.98 (8.1)  
**Viscosity @ 100°C mm²/s:** 128  
**Flash Point (PMCC), °C:** 254  
**Solubility:** Soluble in petroleum and synthetic lubricant bases. Insoluble in water.  
**Use Concentration, % mass:** 0.5 - 4.0  
**Typical Uses:** VANLUBE® 9317 is an amine antioxidant designed to give excellent high temperature performance in synthetic polyolester based lubricants. At high temperatures, it significantly reduces the sludge and varnish typically seen with more conventional amine antioxidants.

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Lubricant manufacturers have enjoyed the benefits of VANLUBE® 7723 lubricant additive for years as an ashless multifunctional additive for everything from grease to engine oil. It is also approved for incidental food contact.

For the more demanding applications where improved oxidation, sludge and deposit control is important and food grade is not a requirement, Vanlube 996E is the product to consider.
More Than Just a Drop in the Bucket

VANLUBE® 0902
Lubricant Additive

Attack your most challenging lubrication issues with VANLUBE® 0902, a multi-purpose package for industrial oils and greases.

- Global Registration
- Metal-Free
- Protects Against Corrosion
- Reduces Oxidation
- Minimizes Wear
- Carries a High Load at Extreme Pressure Conditions
Do You Need Rust Protection?

Vanderbilt’s dinonylnaphthalene sulfonates are excellent rust inhibitors.

They are recommended for use where rust inhibition and water resistance are needed.

They can be used in environments that are exposed to large amounts of water, such as paper machine oils and rock drill oils. They also provide rust protection and water separability properties in turbine oils, hydraulic fluids and circulating oils.

They can also be used in greases and in-process rust preventive temporary coatings in metalworking processes.

Contact us for more information.

VANLUBE® RI-BSN

VANLUBE® RI-CSN

VANLUBE® RI-ZSN
More Than Just a Drop in the Bucket

MOLYVAN® 855
Friction Reducer

Today’s high performance lubricants require special additives to perform successfully. MOLYVAN® 855 is an organo-molybdenum additive that contains no phosphorus or sulfur and is more cost effective than traditional molybdenum dithiocarbamates.

Lubricants formulated with MOLYVAN® 855 exhibit enhanced oxidation and wear protection, as well as reduced timing chain wear and improved low speed pre-ignition (LSPI) performance, two new requirements proposed for GF-6.

Order a sample and discover the many benefits of this unique additive component in your lubricant formulation.
More Than Just a Drop in the Bucket

Antioxidants
- VANLUBE® AZ
- VANLUBE 81
- VANLUBE 1202
- VANLUBE 996E
- VANLUBE 81
- VANLUBE 887
- VANLUBE RD
- VANLUBE 961
- VANLUBE 7723
- VANLUBE BHC
- VANLUBE PA

Friction Reducers/EP-Antiwear Agents
- MOLYVAN® A
- MOLYVAN 855
- MOLYVAN 829
- VANLUBE 7611M
- VANLUBE 7723
- VANLUBE W-324
- VANLUBE 0902
- MOLYVAN L
- VANLUBE 73
- VANLUBE 871
- VANLUBE 8610
- MOLYVAN 3000
- MOLYVAN 289
- MOLYVAN 822
- VANLUBE 73 Super Plus
- VANLUBE 972M
- VANLUBE 9123
- MOLYVAN FEI PLUS
- VANLUBE 972NT

Metal Deactivators
- CUVAN® 303
- CUVAN 826
- VANCHEM® NATD
- VANLUBE 601E
- NACAP®
- VANLUBE 704S

Rust Inhibitors
- VANLUBE RI-A
- VANLUBE RI-BSN
- VANLUBE RI-G
- VANLUBE RI-CSN
- VANLUBE 8912E
- VANLUBE RI-ZSN

Tackifiers
- VANLUBE TK 200
- VANLUBE TK 223

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Branching Makes It Better with MOLYVAN® 3000 Friction Reducer

MOLYVAN® 3000 Friction Reducer is an exceptional oil soluble MoDTC friction modifier containing 10% molybdenum with antiwear and antioxidant properties.

Its unique molecular branching provides superior fluid compatibility/stability at low temperature and enhanced robustness for improved retention of friction reduction in aged oil.