

# QUALITY PROTECTS.



**QUALITY WORKS.**

**LANXESS**  
Energizing Chemistry

## **Naugalube® 438L** **Nonylated diphenylamine antioxidant**

Naugalube® 438L is based on LANXESS antioxidant technology, with a proven track record of reliable performance for over 40 years. Developed for the most demanding environments, Naugalube® 438L is recognized throughout transport and industrial lubricant markets as an antioxidant of choice.

Naugalube® 438L is a liquid antioxidant for use in a broad range of transport and industrial lubricants. It offers excellent protection against high-temperature oxidation and lubricant degradation in mineral and synthetic-based fluids. Typical treatment levels may range between 0.05% and 1.0%. Naugalube® 438L can also be used in conjunction with other Naugalube® antioxidants such as alkylated diphenylamines, alkylated phenyl- $\alpha$ -naphthylamine and/or hindered phenolics.

### Applications

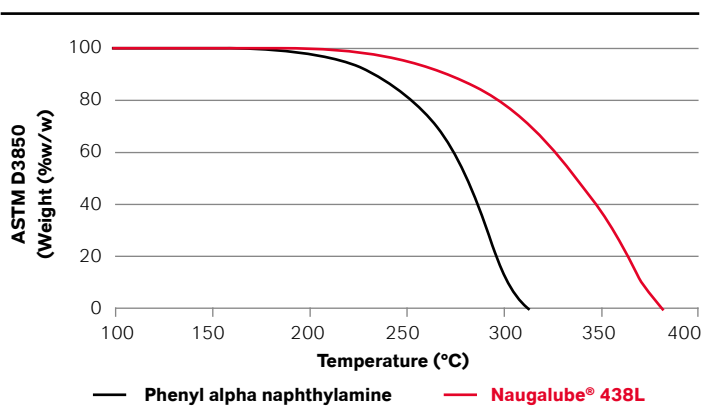
● Primary recommendation      ● Alternative recommendation

Industrial						Marine		Aviation		Automotive				Grease		
Gear oil	Turbine oil	Hydraulic oil	Heat transfer oil	Chain oil	Compressor oil	Trunk piston engine oil	System oil	Turbine oil	Hydraulic oil	Gasoline engine oil	Diesel engine oil	Auto transmission fluid (ATF)	Differential fluid	Automotive grease	Industrial grease	Aviation grease
●	●	●			●	●	●	●	●	●	●	●	●	●	●	

## Features

- Liquid antioxidant
- High-molecular-weight antioxidant
- Excellent high-temperature performance
- Effective control against viscosity increase
- Reduced varnish, deposits and sludge formation

### TGA profile of Naugalube® 438L

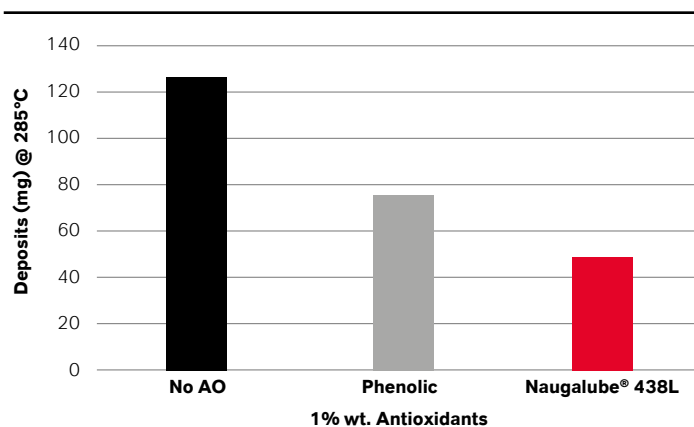


Additive volatility can influence lubricant performance characteristics. Thermo-gravimetric analysis (TGA) of Naugalube® 438L demonstrates its high thermal and oxidative stability and superior performance when compared alongside naphthylamine-type antioxidant chemistry, supporting its use in higher-temperature crankcase applications.

## Benefits

- Provides easy handling and blending
- Low volatility providing prolonged antioxidant protection in finished formulations
- Reduced oil oxidation, prolonged lubricant life and extended service intervals
- Positive impact on oil circulation and fuel efficiency
- Decreased wear, plugging and mechanical seal damage

### Antioxidant response by TEOST MHT ASTM Method D7097



TEOST MHT (thermo-oxidation engine oil simulation test) is an industry standard test method for the determination of moderately-high-temperature piston deposits. TEOST MHT testing of Naugalube® 438L shows substantial antioxidant response and resistance to deposits over the phenolic in SAE 5W-20 PCMO (ILSAC GF-4) Group II based oil.

**Shipping information:** tank cars, tank trucks and non-returnable drums

**LANXESS**  
Energizing Chemistry

### LANXESS Corporation

Business Unit Lubricant Additives  
2 Armstrong Road  
Shelton, CT 06484, USA  
Tel: +1-203-573-2000

lubricant.additives@lanxess.com  
http://lab.lanxess.com

The manner in which you use and the purpose to which you put and utilize our products, technical assistance and information (whether verbal, written or by way of production evaluations), including any suggested formulations and recommendations are beyond our control. Therefore, it is imperative that you test our products, technical assistance and information to determine to your own satisfaction whether they are suitable for your intended uses and applications. This application-specific analysis must at least include testing to determine suitability from a technical as well as health, safety, and environmental standpoint. Such testing has not necessarily been done by us. Unless we otherwise agree in writing, all products are sold strictly pursuant to the terms of our standard conditions of sale. All information and technical assistance is given without warranty or guarantee and is subject to change without notice. It is expressly understood and agreed that you assume and hereby expressly release us from all liability, in tort, contract or otherwise, incurred in connection with the use of our products, technical assistance, and information. Any statement or recommendation not contained herein is unauthorized and shall not bind us. Nothing herein shall be construed as a recommendation to use any product in conflict with patents covering any material or its use. No license is implied or in fact granted under the claims of any patent.

**Health and Safety Information:** Appropriate literature has been assembled which provides information concerning the health and safety precautions that must be observed when handling the LANXESS products mentioned in this publication. For materials mentioned which are not LANXESS products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be followed. Before working with any of these products, you must read and become familiar with the available information on their hazards, proper use, and handling. This cannot be overemphasized. Information is available in several forms, e.g., material safety data sheets and product labels. Consult your LANXESS Corporation representative or contact the Product Safety and Regulatory Affairs Department at LANXESS.

**Regulatory Compliance Information:** Some of the end uses of the products described in this publication must comply with applicable regulations, such as the FDA, NSF, USDA, CPSC and BFR. If you have any questions on the regulatory status of these products, contact your LANXESS Corporation representative or Regulatory Affairs Manager at LANXESS.

**Note:** The information contained in this publication is current as of August, 2018. Please contact LANXESS Corporation to determine if this publication has been revised.

Naugalube®, LANXESS and the LANXESS Logo are trademarks of LANXESS Deutschland GmbH or its affiliates. All trademarks are registered in many countries in the world.