



Distributed in the Interest
of Product Development

VANDERBILT

Technical Data

Petroleum Department

VANLUBE® W 324

Tungsten Lubricant Additive

Antiwear Agent

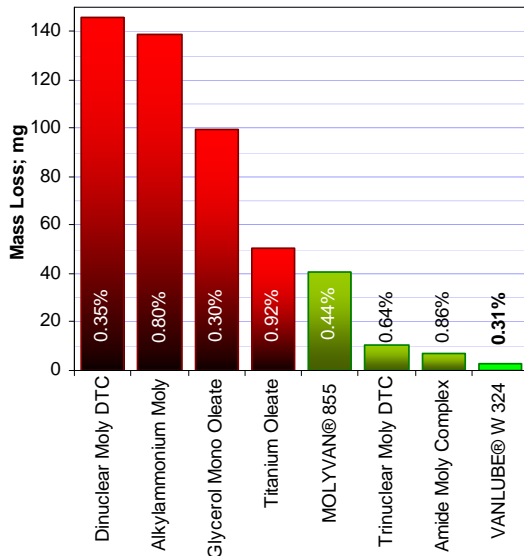
Antioxidant

Typical Properties

Physical State:	Liquid
Density at 25°C, Mg/m ³ :	1.06
Flash Point, PMCC, °C:	175
Nitrogen Content, %:	1.2
Tungsten Content, %:	14

VANLUBE® W 324 Lubricant Additive is an organotungstate which is soluble in petroleum fuels and lubricants. It is an effective general-purpose, sulfur and phosphorus-free antioxidant and antiwear agent for a wide range of automotive and industrial lubricants.

Falex Pin & Vee Block
500 lb. load; 1 hr.
350 ppm metal where applicable

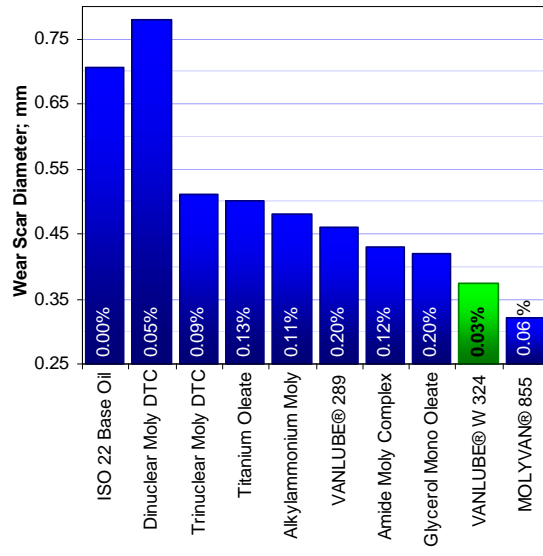


% = Weight Percent of Additive
Red = Failed Test; Pin Broke

FIGURE 1

VANLUBE® W 324 provides superior antiwear protection relative to other lubricant additives in the Falex Pin and Vee Block. Here it provides 58% more protection while using 63% less additive than its nearest competitor.

ASTM 4172¹: Four Ball Wear
¹1800 rpm; 54°C; 1 hr. @ 20 kgf
50 ppm metal where applicable



% = Weight Percent of Additive

FIGURE 2

In the Four Ball Wear test, VANLUBE® W 324 provides excellent antiwear protection with only 50 ppm of tungsten, and at half the charged weight of its nearest competitor.

R.T. Vanderbilt Company, Inc., 30 Winfield Street, P.O. Box 5150, Norwalk, CT 06856-5150
Telephone: (203) 853-1400 - Fax: (203) 853-1452 - Web Site: www.rtvanderbilt.com

Before using, read, understand and comply with the information and precautions in the Material Safety Data Sheets, label and other product literature. The information presented herein, while not guaranteed, was prepared by technical personnel and, to the best of our knowledge and belief, is true and accurate as of the date hereof. No warranty, representation or guarantee, express or implied, is made regarding accuracy, performance, stability, reliability or use. This information is not intended to be all-inclusive, because the manner and conditions of use, handling, storage and other factors may involve other or additional safety or performance considerations. The user is responsible for determining the suitability of any material for a specific purpose and for adopting such safety precautions as may be required. R.T. Vanderbilt Company, Inc. does not warrant the results to be obtained in using any material, and disclaims all liability with respect to the use, handling or further processing of any such material. No suggestion for use is intended as, and nothing herein shall be construed as, a recommendation to infringe any existing patent, trademark or copyright or to violate any federal, state or local law or regulation.

ASTM D6186: Pressurized Differential Scanning Calorimetry
180°C

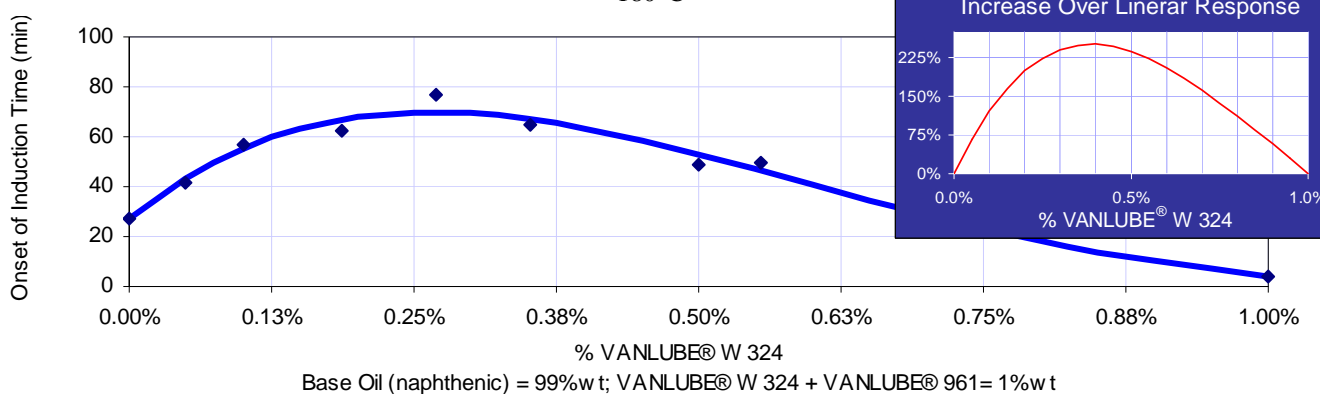


FIGURE 3

VANLUBE® W 324 works as an antioxidant synergist with alkylated diphenylamines. In the graph above it is shown to increase the effectiveness of **VANLUBE® 961** by 250%.

ASTM D6335: TEOST 33C
700 ppm W or Mo

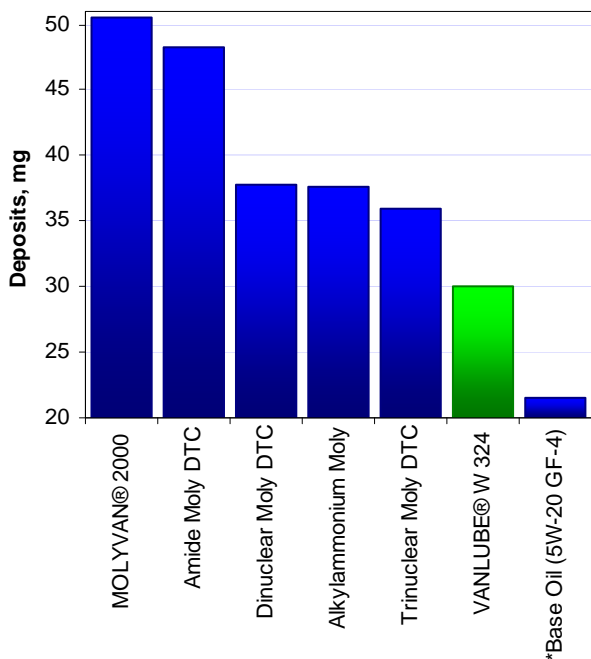
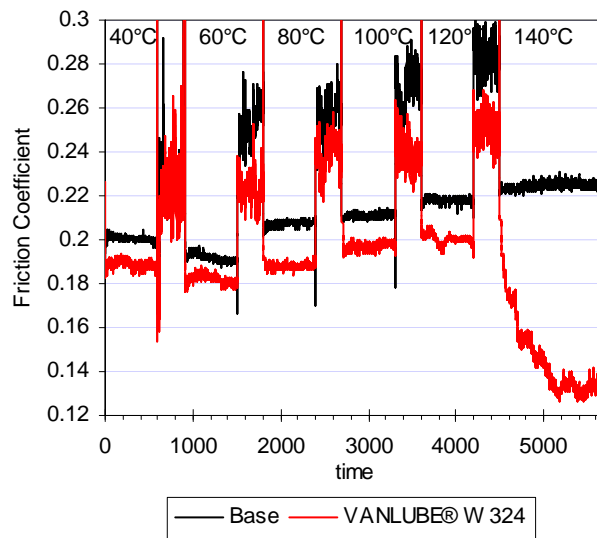


FIGURE 4

VANLUBE® W 324 resists deposit formation more effectively than molybdenum when exposed to high temperatures.

SRV Friction Test
700 ppm W



Base= ISO 32 Group II + 3.9% dispersant + ZDDP (600ppm P) + 1% VANLUBE® SL

Ball on Disk; 4N; 20 Hz; 10 min @ x °C followed by 5 min hold

FIGURE 5

VANLUBE® W 324 activates at elevated temperatures to provide friction modification.