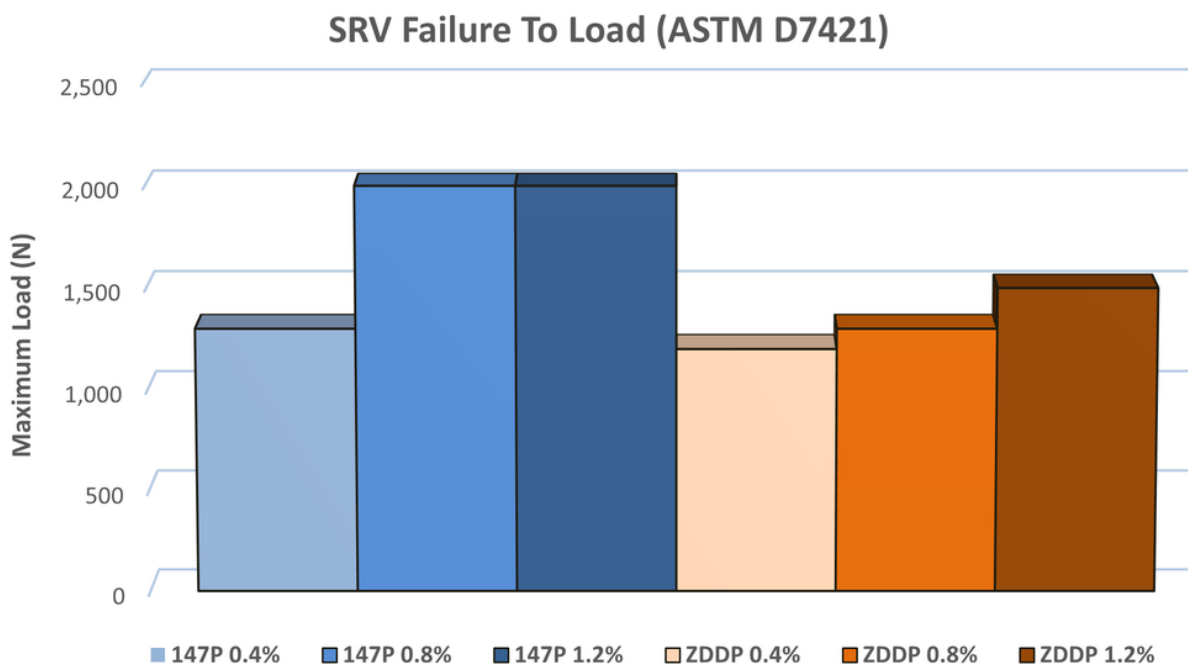


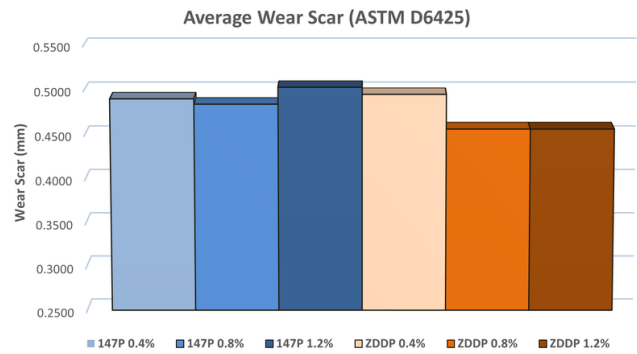
DOVERLUBE AW 147P is a phosphorus based lubricant additive that demonstrates anti-wear and antioxidant properties in lubricating oils, greases, driveline, and other industrial lubricant applications. **DOVERLUBE AW 147P** is a polymeric phosphite ester and has HX-1 approvals.

DOVERLUBE AW 147P exhibits improved load carrying capacity as demonstrated via ASTM D7421 SRV testing. **DOVERLUBE AW 147P** was evaluated in a basic package of base oil, aminic AO, and additive vs a similar ZDDP based package. Doverlube AW147P improved the failure to load point vs. ZDDP as a level of 0.4% in the blend test, and significantly extended the load point failure to 2,000N when blend levels were increased.

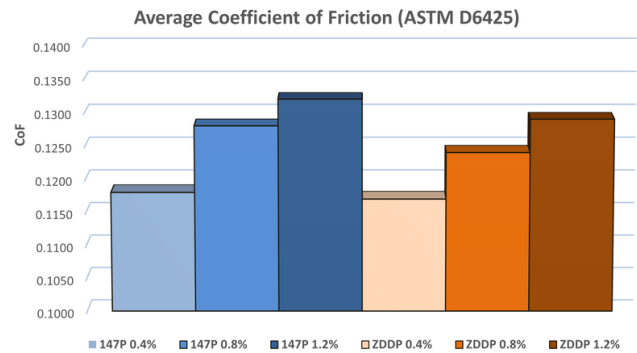


ASTM D7421 Failure to Load Testing- Blends 1-3 are Doverlube AW 147P based samples Blends 4-6 are comparable ZDDP based blend packages. Maximum test load – 2,000N.

ASTM D6425 wear evaluations utilizing the same blends yielded comparable wear scar values for **DOVERLUBE AW 147P** blends as compared to comparable ZDDP based packages. Similar results were demonstrated in CoF values. Higher levels led to slight increases in coefficient of friction results.



ASTM D6425 Wear Testing- Blends 1-3 are Doverlube AW 147P based samples Blends 4-6 are comparable ZDDP based blend packages. Wear scar measurements are in mm.



ASTM D6425 CoF Measurements - Blends 1-3 are Doverlube AW 147P based samples Blends 4-6 are comparable ZDDP based blend packages.

RPVOT testing for oxidative stability and induction end points were completed on the various blends **DOVERLUBE AW 147P** based blends exhibited no detrimental impact on the AO performance.

Package breakdown and blend levels utilized in the above evaluations are detailed for **DOVERLUBE AW 147P** was evaluations. The base package formulations comprised of base oil, aminic AO, and additive vs a similar ZDDP based package.

Typical Properties

Blend	Oxidative Stability End Point (min-25.4psi drop)	Oxidative Induction End Point (min-hard break)
Blend 1 147P (0.4%)	426	460
Blend 2 147P (0.8%)	1330	2540
Blend 3 147P (1.2%)	1216	2905
Blend 4 ZDDP (0.4%)	647	2315
Blend 5 ZDDP (0.8%)	405	2669
Blend 6 ZDDP (1.2%)	N/A	N/A

RPVOT Oxidative Stability Testing- Blends 1-3 are Doverlube AW 147P based samples Blends 4-6 are comparable ZDDP based blend packages.

Blend	Additive	% Add Pack	Actual % in Blend
Blend 1	Doverlube AW 147P	5	0.4
	AO (aminic)		0.6
Blend 2	Doverlube AW 147P	10	0.8
	AO (aminic)		1.2
Blend 3	Doverlube AW 147P	20	1.6
	AO (aminic)		2.4
Blend 4	ZDDP (primary)	5	0.4
	AO (aminic)		0.6
Blend 5	ZDDP (primary)	10	0.8
	AO (aminic)		1.2
Blend 6	ZDDP (primary)	20	1.6
	AO (aminic)		2.4

Blend Packages for SRV performance evaluation. AO L-57 is a diphenylamine based aminic AO. The ZDDP was a straight chain primary ZDDP. Packages were blended at the specified treat rates in Group II paraffinic basestock.

DOVERLUBE AW 147P recommended treat rates are 0.3% – 2.0% when used as an antiwear additive and 0.2% – 1.0% when used as an antioxidant. **DOVERLUBE AW 147P** does exhibit synergies with anti-scuffing additives as well as other antioxidants.

Typical Properties

Property	Result
Appearance	Clear to slightly hazy
Viscosity @ 40°C, cSt	300
Total Acid Value (mgKOH/g)	<0.5
Phosphorus Content (%)	4.5

To maintain product integrity, always keep the container tightly sealed. Prevent any frost and water ingress. It is preferable to store the product indoors.

The information contained on this data sheet is believed to be reliable. Since the conditions of application and use of our products are beyond our control, no warranty is expressed or implied regarding accuracy of the information, the results obtained from the use of the product, or that such use will not infringe on any patent. This information is furnished with the express condition that you will conduct your own tests to determine the suitability of the product for your particular use. (062212) LGP-11®, LUBE-BOOSTER®, MAYCO®, PAROIL®, SUL-PERM®, SYN-CHEK®, SYNKAD®, CHLOREZ®, CHLOROWAX 40®, CHLOROWAX 50®, DOVERNOX®, DOVERPHOS®, DOVERPHOS HIPURE®, and DOVERPHOS S-9228® are federally registered trademarks of Dover Chemical Corporation.