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LANXESS
Energizing Chemistry

Naugalube® PANA Phenyl- α -naphthylamine antioxidant

Naugalube® PANA is an excellent antioxidant for synthetic fluids and mineral oils. It is particularly effective in high temperature applications, such as aviation turbine engine oils, and in the formulation of high performance industrial oils and greases. Naugalube® PANA is a solid antioxidant in flake form typically used at treat levels between 0.05% and 1.0%. Naugalube® PANA is used in the manufacture of

aviation turbine engine oils meeting MIL-PRF-23699 and MIL-PRF-7808 specifications.

For enhanced performance, Naugalube® PANA can also be used in combination with other alkylated diphenylamines, hindered phenolics and/or secondary peroxide decomposer antioxidants, as well as appropriate metal deactivators.

Applications

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
■	■	■			■			■					■	■	■	

■ Primary recommendation ■ Alternative recommendation

X Naugalube®

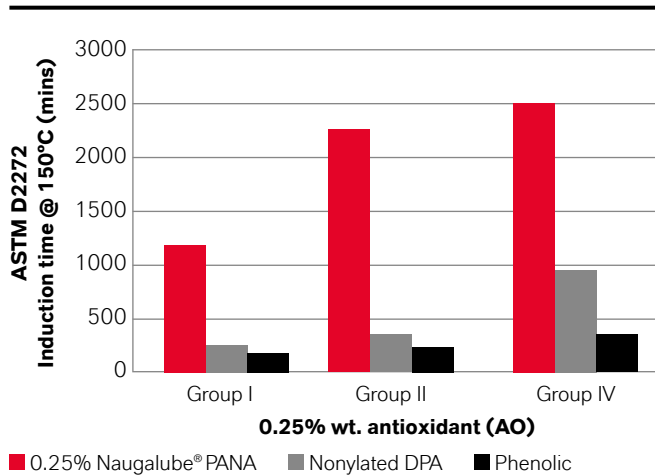
Features

Ashless antioxidant
Excellent high temperature performance providing effective control against viscosity increase
US FDA 21CFR178.3750 approved and Kosher certified
High active nitrogen content

Benefits

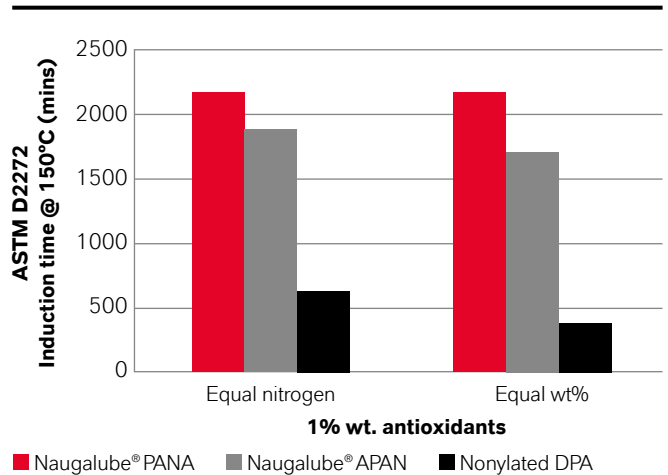
Can be used in a broad range of lubricant formulations
Reduced oil oxidation and prolonged lubricant life
NSF HX-1 approval for use in lubricants subject to incidental food contact at a maximum level of 0.5%
Maximizes antioxidant efficiency and provides added alkalinity

Turbine oil oxidation stability by RPVOT



RPVOT (Rotating Pressure Vessel Oxidation Test) performance testing was run at 150°C in a series of fully formulated turbine oils additized with 0.25%wt. antioxidant. Results of the testing demonstrate that Naugalube® PANA provides superior antioxidant performance to Nonylated ADPA and hindered phenolics in API Group I, Group II and Group IV base oils.

Antioxidant performance in a Group II turbine oil by RPVOT (equal nitrogen content vs. equal weight %)



RPVOT (Rotating Pressure Vessel Oxidation Test) performance testing was run at 150°C in a Group II based turbine oil at both equal nitrogen content and at equal wt%. On an equal nitrogen basis, the data shows Naugalube® PANA and APAN have superior performance over the non-ylated DPA and thereby demonstrates the higher antioxidant activity of Naugalube® PANA and APAN.

Shipping information: 20 kg bags

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Unless specified to the contrary, the values given have been established on standardized test specimens. The figures should be regarded as guide values only and not as binding minimum values. Kindly note that the results refer exclusively to the specimens tested. Under certain conditions, the test results established can be affected to a considerable extent by the processing conditions and manufacturing process.

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