

NOVEMBER 2011



Issue 826

cen-pe-co
LUBRICANTS

CENTRAL PETROLEUM COMPANY
Cleveland, OH Walcott, IA

CENTRAL NEWS

Happy Thanksgiving

As Cen-Pe-Co advances past its 100th year, some things have become abundantly clear. One of the secrets of longer company life is having products that hold their value during both inflationary and deflationary economic times. Another secret is that successful customers who can appreciate the extra value quality products bring to their businesses are in it for the long run. And still another secret is that having dedicated people who care about the reputation and quality of their company and its products is necessary for long term survival.

While most companies advertise, even guarantee that their prices are the lowest; Cen-Pe-Co continues to save its customers money by never attempting to be the cheapest. We save our customers money by maximizing the potential fuel economy and life of their equipment. A flash in the pan doesn't have the consistency it takes for long time survival. Cen-Pe-Co's employees, salespeople, distributors, customers and their families have proven that hard work, works.

I would like to thank everyone involved in and with our business for making our 100th year, our biggest and best sales year ever.

Paul T. Webster III

SN

By Blaine Ballentine, Lubrication Engineer

API SN is the most recent specification for gasoline powered passenger vehicles and is required beginning with the 2011 model year. This article discusses the specification.

What and Why

API specifications are a series of engine tests and bench tests to provide assurance to equipment manufacturers and consumers that oils will properly lubricate engines, and help equipment manufacturers comply with government mandates for fuel economy and emissions equipment durability.

The engine tests are performed in a laboratory where the engines run in a test stand and are connected to computers. The tests are designed to stress the oil in an attempt to predict in a short period of time how the oil will perform over an engine's lifetime. API SN includes five engine tests to assess wear, oil breakdown, sludge, varnish, corrosion, and fuel economy.

The engine tests are complimented with bench tests to predict the oil's catalyst compatibility, volatility, oxidation, wet filterability, foaming, cold temperature gelling, shear stability, seal compatibility, and emulsion retention for ethanol blended fuels.

API categories begin with a "Needs Statement," which indicates why the current category needs to be replaced. In the case of SN, the auto manufacturers were requesting improvements in:

- Fuel economy and fuel economy retention
- Engine oil robustness
- Protection of the emission control system

Robustness

Although the category was driven primarily by environmental concerns, engine oil robustness was improved. Compared to the previous specification, SM, the newer SN specifications provides improved high temperature deposit control, more stringent sludge control, better oxidation stability for protection of turbochargers, and better protection of engines operating on ethanol fuel blends up to E85.

Fuel Economy

The improvements in fuel economy are not as clear. Fuel economy is tested in a GM V-6 engine in a new test called the Sequence VID. Fuel economy is measured at 16 hours, and then again at 100 hours. As one would expect, fuel economy declines as the oil ages, which is why they take measures early in the

test and at the end of the test to measure fuel economy fuel retention. The test oil has to provide fuel economy improvements compared to a reference oil as shown in Table 1.

The Sequence VID uses a new and more efficient engine than the VIB test that it replaces. With engine manufacturers taking a lot of friction out of the engine, it is harder to measure oil's contribution to fuel economy. Adding to the challenge is the fact that fuel economy declines with engine age, and the baseline fuel consumption with the reference oil moves as the test engine ages. There is not full agreement that the VID can measure a difference between the current category, SN, and the previous one, SM¹. Fuel economy in the test is determined primarily by oil viscosity at operating temperature. Although results may be different in the real world, the Sequence VIB has trouble distinguishing fuel economy differences between SAE 0W-20 and 5W-20. Similarly, it does not appear to be capable of demonstrating fuel economy differences between 0W-30, 5W-30, and 10W-30.

Viscosity Grade	Fuel Economy Improvement Sum	Fuel Economy Improvement after 100 Hours
XW-20	2.6% min.	1.2% min.
XW-30	1.9% min.	0.9% min.
10W-30	1.5% min.	0.6% min.

Fuel economy retention can create a dilemma. At the end of the Sequence VIB test, the friction modifiers are worn out. Extending the test beyond its normal 100 hours, fuel economy improvement can fall to half². Extended drains increase fuel consumption. So if you are trying to be "green," is it better to waste fuel and save oil, or is it better to produce more waste oil and save fuel?

The friction modifiers do not get along well with detergent additives in the test world. Fuel economy in the VID test could be improved if engine cleanliness was relaxed in the Sequence IIIG test^{3,4}. We can assume that detergents and friction modifiers compete for surfaces, as if detergents are trying to clean off friction modifiers.

This caused some disagreement in the development of the SN specification as some committee members wanted to leave cleanliness requirements at the previous level and further enhance fuel economy. In the end, the limit for piston deposits was reduced in the Sequence IIIG test, which was also used in the previous category, SM. So, the same test is used for SN, but the limits are tighter.

(Continued on page 3)

(Continued from page 2)

Emissions System Durability

Phosphorus is a known catalytic converter poison. It is part of the zinc anti-wear additive, ZDDP, used in motor oils. Years ago, the industry tried to develop an engine test to show an oil's tendency to form catalyst deposits. However, they could not achieve repeatability, so they decided to use a bench test to limit phosphorus content. The phosphorus limit for SN remains at 800 PPM.

Most of us have heard from owners of high performance engines that "they have taken all of the zinc out of the oil." They would be surprised to learn that there is also a lower limit. The engine manufacturers want ZDDP in engine oils and require at least 600 PPM phosphorus. In an engine test for a previous category, oil life doubled when phosphorus from ZDDP was increased from 500 to 800 PPM⁵.

The two biggest factors in phosphorus deposits on catalytic surfaces are oil consumption and the volatility of the ZDDP additive. API SN requires 79% retention of phosphorus after the Sequence IIIG test. If it stays in the oil, it is not plugging the cat. The magazines make ZDDP sound like it is a single compound, but it is actually a family of additives. Different ZDDP additives have different performances for wear, anti-oxidancy, rust inhibition, activation temperature, and as this new test points out, volatility.

Compromises

As passenger car specifications have changed over the years, it has led to some interesting compromises. Let's look at base oil. Volatility and oxidation requirements have tightened to reduce oil consumption and allow longer drains. The oil industry responded by severely hydrotreating base oils—the same method used to remove sulfur from diesel fuel. Just as hydrotreating diesel fuel lowered its lubricity, today's severely hydrotreated base oils have lower lubricity and require additional additive treatment⁶.

Viscosity grades have trended lower. SAE 10W-30 has not been recommended by any of the mainstream manufacturers for several years now, although it is a very close second to 5W-30 in the market place⁷. SAE 5W-30 is the most popular grade with SAE 5W-20 gaining share fast. Some vehicles require SAE 0W-20, and yet to be defined SAE 0W-10 is on the horizon as manufacturers stretch to improve fuel economy.

However, bearing wear can increase 500%, ring wear 300%, and cam wear 50% by dropping from an 0W-20 to somewhere between an 0W-10 and 0W-15 (if such grades existed)^{8,9}. So, fuel economy from using a thinner oil comes at the expense of additional wear.

Downward Trend

Recent trends in consumer behavior are somewhat difficult to interpret. On the one hand, the drivers with signs of engine abuse (low oil levels, oil levels that are too high, or dirty oil) decreased from 32% in 2008 to 24% in 2010¹⁰. Before concluding that they want their cars to last longer in a tough economy, consider that the average oil drain interval is longer, with the average drain interval at quick lubes above 4500 miles.

The biggest shift in passenger car oils in recent years has been toward private label, off-brand and independent brands as consumers and installers look for lower cost¹¹. Particularly this year where the major oil companies have put through four price increases, installers are asking about the difference between name brand products and no name products, and more and more have switched to cheaper products after being assured they will do "no harm"¹². In the words of one marketer, we are seeing "a race to the bottom by some buyers and sellers in terms of price and unfortunately quality as well."

The lubricant manufacturers are right there to help out with cheaper products. They change additives or base oil according to what is cheapest that day. Some unethical blenders have even used or sold "line wash" for engine oil¹³.

Line wash or flush oil is the commingled mixture that is the result of switching from one viscosity grade to another or one lubricant product to another at an oil blending plant. In most plants, there is not a good way to drain what seems like miles of pipes, prior to a product change. Oil companies capture the cross-contaminated mixture after the change and use it for low performance need products, such as bar and chain oil or form release oil, or they sell it to others who make such products.

We are not talking small potatoes here. Close to 10 million gallons of line wash are produced each year in the United States. Shell sells between 3 and 4 million gallons of line wash annually¹⁴.



(Continued on page 4)

(Continued from page 3)

Obviously, millions of gallons of line wash are going someplace. Unfortunately, some of it has made it to the market as engine oil with little or no correction.

Cen-Pe-Co

Cen-Pe-Co PV Synthetic Blend Oils are made with a blend of synthetic base oil and virgin 100% paraffin base oil augmented with the most shear stable polymer available. The result is a superior lubricant for today's passenger vehicles that reduces wear and provides longer drain protection.

Reference Notes

1. "Evolution of ILSAC GF-5" by Andy Ritchie, Compoundings, 60:1:9
2. "Upgrade, Upheaval" by Lisa Tocci, Lubes'n'Greases, 16:1:22
3. Ibid
4. "GF-5 Lotts of Action and Moving Forward" Infineum's Insight, 12/09 p. 16
5. "Additives for Emergin Markets" by Nancy DeMarco, Lube Report www.imakenews.com/lng/e_article001186190.cfm?x=bdgqh4b,b1lb6cby 8/27/08
6. "Boundary Lubricity Additives" by Neil Canter, Tribology & Lubrication Technology, 9/09 p.10
7. "True Upgrade: ILSAC GF-5 Delivers Performance" Compoundings, 60:2:19
8. "Engine Oil Viscosity and Bearing Wear: Field Test Results" by Richard A. Demmin, Fred Girshick, and Alan M. Schilowitz, SAE Paper 922342, 10/1/92
9. "Influence of Engine Oil Viscosity on Piston Ring and Cam Face Wear" by Toshihide Ohmori, et.al., SAE Paper 932782, 10/1/93
10. "Drivers Flunk Car Care" by George Gill, Lube Report www.imakenews.com/lng/e_article001752371.cfm?x=bgthfy6,b1lb6cby 5/12/10
11. "Fast Lubes Weather Rising Costs" by George Gill, Lube Report www.imakenews.com/lng/e_article002222505.cfm?x=bk3v017,b1lb6cby 9/28/11
12. "Is Price Changing the Business" by Thomas F. Glen, Lubes'n'Greases, 16:7:1217:9:46
13. "The True Value and Cost of Line Wash" by Thomas F. Glen, Lubes'n'Greases, 16:7:12
14. "Shell Shifts 'Motor Oil Matters' to API" by George Gill, Lube Report www.imakenews.com/lng/e_article001759991.cfm?x=bgvt2jc,b1lb6cby 5/19/10

Additional References

1. American Petroleum Institute, <http://www.api.org/certifications/engineoil/new/index.cfm>
2. "ILSAC GF-5 Crankcase Specifications Development" Infineum, <http://www.infineum.com/Pages/gf5.aspx>
3. Lubrizol, <http://www.gf-5.com/>

DEXOS™

GM has released a new engine oil specification for gasoline powered passenger cars called dexos™ 1. They also have a light duty diesel oil specification for Europe called dexos™ 2. Since diesel

pickup trucks require heavy duty API CJ-4 and GM does not sell diesel cars here, dexos™ 1 is usually just called "dexos™" in the United States. GM prefers dexos™ not be capitalized, so we will try to avoid starting a sentence with it.

Dexos™ is intended to be a world wide specification for GM vehicles. It is based on the API SN specifications, but adds four ACEA (the European version of the API) tests¹. Although dexos™ uses API SN tests, the limits for piston deposits are more stringent in one of the tests, the fuel economy requirement with aged oil is increased, and the requirement to measure cam wear in a third test is removed. Also, the volatility requirement is lowered, forcing the use of at least a partially synthetic oil.

GM claims that dexos™ provides improved fuel economy, better aeration resistance, longer emissions system life, and longer drain protection². GM licenses the name and logo of dexos™ for a significant fee, which has caused some conflict.

GM charges a fee calculated from the region's total market of passenger car oil in gallons, GM's percentage market share of vehicles, and the oil company's percentage market share of passenger car oil³. The fee is estimated to be about \$.36 per gallon⁴. GM is aggressive in promoting dexos™, stating that "...unlicensed products may result in lower levels of performance and engine damage not covered under warranty⁵."

When a manufacturer uses the warranty for leverage to scare consumers into buying a licensed product while charging an outrageous license fee, there are going to be challenges⁶. On top of that, the fee is based on market share, not the actual gallons of oil sold under the dexos™ logo. Then, the license fee does not apply to GM dealers, giving them an unfair advantage. It is not surprising that the Federal Trade Commission is considering an investigation of GM's use of dexos™^{7,8}.

Several manufacturers of passenger car oils, including Valvoline and Castrol, have opted to offer products that meet dexos™ 1 specifications, but are not licensed.

At Central Petroleum, we appreciate the higher standard of quality that dexos™ offers. We offer Cen-Pe-Co Synthetic Oil that achieves this higher standard for wear, cleanliness, and oil life, but it will not be licensed and we will not be passing a license fee on to our customers.

Reference Notes

1. "Global Coverage, the Roll Out of General Motors' dexos™ Specifications" Infineum's Insight, 6/2010 p8
2. "Licensed GM dexos™ Products" www.gmdexos.com/licensed-brands.html copyright 2009

(Continued on page 5)

(Continued from page 4)

3. "GM Switches to Flat Fee on Dexos" by George Gill, Lube Report, www.imakenews.com/lng/e_article001713657.cfm 3/31/11
4. "Does dexos Fit Your Needs" by Lisa Tocci, Lubes'n'Greases, 17:2:30
5. "What you Need to Know about dexos™" www.gmdexos.com/aboutdexos.html copyright 2009
6. "Coalition Seeks FTC Review of Dexos" by George Gill, Lube Report, www.imakenews.com/lng/e_article002049307.cfm?x=bjdk0jg,blb6cby 3/16/11
7. "FTC Seeks Comments on Warranty Act" by George Gill, Lube Report, www.imakenews.com/lng/e_article002198947.cfm?x=bjqtwhk,blqdw92 8/31/11
8. "Automakers' Warranty Ties Blasted" by George Gill, Lube Report, www.imakenews.com/lng/e_article002255733.cfm?x=b11,0,w

CenPeCo Synthetic Oil and PV Synthetic Blend Oils

Central Petroleum is realigning its oils for Personal Vehicles—cars, pickup trucks, and SUVs. We are proud to introduce CenPeCo Synthetic SAE 5W-30. It is formulated to exceed API SN and the wear requirements of GM's dexos™ 1. This fully synthetic product provides superior deposit control, enhanced wear protection, easier cold weather starting, outstanding shear

stability, and prolonged drain protection.

CenPeCo Synthetic Blend oils have been upgraded to exceed the requirements of API SN and are now labeled Cen-Pe-Co PV Synthetic Blend Oil. CenPeCo PV Synthetic Blend Oil is available in SAE 5W-20, 5W-30, and 10W-30. So, we have a fully synthetic 5W-30 and a synthetic blend 5W-30.



At Central Petroleum we endeavor to make the best lubricants available. GM's dexos™ specification is more stringent than API SN and requires a more robust additive. We use the same dexos™-qualified additive at the same amount in our PV Synthetic Blend oils as Cen-Pe-Co Synthetic Oil. Either version of the product provides superior protection and performance in passenger vehicles.



In attendance at a recent New York State Meeting were: (from L to R) Paul Webster, (President and CEO), John Arnold, John "Jack" Burns, Eddie Jacobs (Ed's son), Real Deslauriers, David Johannessen, Herb Cox, Frank Burket, Ed Jacobs, Tom Burns, Dennis Martindale, Erich Haesche, and Andy Batty.

Customer Testimonial....



One of John Arnold's (NY) customers, Bob Russell, told the following testimonial to John during a recent visit.

"Our sprint car: on the 5th lap, the oil pump broke. The motor was turning 6500rpm for 20 - 30 seconds. He expected crank, rods, pistons, definately berings to be shot!" Three days later they opened up the engine. Bearings not even scuffed! They strained the oil through a paint filter to check for wear and saw none! He put the oil back in the engine!!

Bob said that using Cen-Pe-Co Oil saved him \$30,000 that day!

Bob, is a sprint car owner and engine builder. Bob also is head mechanic for a large General Contractor with over 200 pieces of equipment. They use Cen-Pe-Co Oils and Greases and Bob has said that Cen-Pe-Co is his "maintainance program". That is because they have seen when they use Cen-Pe-Co, their equipment lasts longer! They have proven from their small Honda motors, to pick-up trucks, to their heavy construction trucks and equipment; using Cen-Pe-Co reduces wear and oil consumption and their equipment lasts longer.

