



Tech Corner: Phase Technology

By Sue Dickens

If an ounce of prevention is worth a pound of cure then the 3-pound CPA-T30 cloud point analyzer designed and manufactured by Phase Technology of Richmond, B.C. should be worth its weight in gold when it comes to preventive maintenance. Actually it should be worth the weight of a tanker full of fuel, to be more precise.

Without this unit, fleets and owner/operators run the risk, under certain conditions, of fuel gelling especially as the trucking industry begins to use specialty fuels such as biodiesel blends.

What does all this mean?

Frank Meyer, Director, Global Business Development for Phase Technology, explains.

Fuel gelling, technically referred to as cloud point, is a concern to drivers who travel through the cold and diverse climates within North America. Cloud point is defined as the temperature at which waxy solids first appear during the cooling of diesel fuel. It is a quality control test that has been in use by petroleum refineries for well over 50 years. Worldwide, a significant majority of refineries rely on this test for determining diesel fuel operability in cold weather.

Cloud point is the preferred test due to its fail-safe nature in predicting operability, quick analysis time and excellent precision. Besides cloud point, other operability test methods are available; however; their reliability is significantly lower and they are impractical for field use.

The CPA-T30 is the only portable cloud point analyzer in the world designed for on-road/off-road diesel and biodiesel fuels, and the only automatic cloud point analyzer reasonably priced. In fact there is nothing like the CPA-T30 priced under \$20,000.

CLOUD POINT AND FUEL QUALITY

The cloud point analyzer is useful not only during the winter months but in the spring and the fall as well. "One of the most important fuel issues, as we move out of the cold season, is to be sure you are not purchasing loads of fuel that have an unnecessarily low cloud point" says Frank.

"Generally towards the end of March the petroleum industry has what is called the changeover of fuels from the winter fuels to the summer fuels. This means if your fuel supplier is still selling you winter fuels you could be losing 1% to 5% fuel economy, this is strictly a rule of thumb" he explains. Fleets need to pay attention to fuel quality and fuel economy; these are among the most important issues."

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INDUSTRY CHALLENGES TECHNOLOGY SOLUTIONS
"The challenge of fuel gelling is a complex one that has been in use by petroleum refineries for well over 50 years. Worldwide, a significant majority of refineries rely on this test for determining diesel fuel operability in cold weather. Cloud point is the preferred test due to its fail-safe nature in predicting operability, quick analysis time and excellent precision. Besides cloud point, other operability test methods are available; however; their reliability is significantly lower and they are impractical for field use. The CPA-T30 is the only portable cloud point analyzer in the world designed for on-road/off-road diesel and biodiesel fuels, and the only automatic cloud point analyzer reasonably priced. In fact there is nothing like the CPA-T30 priced under \$20,000."

It is important to know that when fuel reaches its cloud point waxy solids appear and begin to plug fuel systems. For a fleet or independent operator this is an undesirable situation; the downtime, towing and/or repair can cost up to several hundred dollars. Also, in a "just in time" marketplace haul contracts are at stake.

INDUSTRY CHALLENGES, TECHNOLOGY SOLUTIONS

"The challenge of fuel gelling primarily effects long-haul trucks. This is mainly due to the variable fuel quality throughout North America. There are well over 100 regions where a diesel or biodiesel fuel is blended according to historical average low temperature from September to March. Typically, refineries blend diesel fuels approximately 6°Celsius colder than the historical average low temperatures. In the United States such charts may be found in ASTM D975 specifications and there is also something similar in Canada from the Canadian Goods and Standards Board (CGSB).

Generally, trucks don't encounter problems as they travel through diverse climates where ambient conditions can fluctuate by as much as 30°Celsius. This is mainly due to the fact that during operation hot fuel continually circulates through the entire fuel system. As an example, the real challenge is when a driver fuels in Redding, California and hauls produce back to Edmonton, Alberta during the month of January. Enroute the driver decides to stop in Coeur d'Alene, Idaho which is easily reached with three quarters of one 250 gallon saddle tank. The fuel purchased in northern California, in January, will have a cloud point of approximately -8°Celsius. The historical average low temperature in northern Idaho in January is -21°Celsius. As we all know idling is not a good practice however if the driver elects to turn off the truck for a period of time and the ambient temperature and fuel in the fuel system dips below -8°Celsius the truck may not re-start.

Fleet practices to avoid fuel from gelling include frequent refueling along their regular routes, blending in more #1 fuel (or kerosene), fuel additives and excessive idling. Naturally all of these practices have their own shortcomings and cost time and money. If the cloud point of the fuel is known, the extra stops, kerosene or additive use and idling may not be necessary at all. Fleets should be more aware of the fuel that they are purchasing from their fuel suppliers as well as from vendors along their regular long-haul routes" says Frank.

He sees the portable cloud point analyzer as the preventive solution and describes its use this way.

"In addition to checking up on your home base fuel suppliers, a real savvy truck fleet would send this unit out with one of their drivers and say look, we purchase fuels along this route, so when you do, take a sample and test it for us (or just collect a sample for testing later) so we can get an idea of which vendors are selling us the fuel quality we want on that route. That can determine where your drivers purchase fuels in the future," he explains.

To test the fuel all the driver has to do is put 10 ml of diesel fuel into the unit, push the start button and in several minutes they have a test result.

"You can get a rechargeable battery pack or cigarette lighter adaptor with the analyzer if you are not near electricity, making it a truly portable device," says Frank.

BIODIESEL COLD FLOW PROPERTIES

Biodiesel fuel presents even more concern when it comes to cold flow properties. In many U.S. states, biodiesel is or is about to become legislated for mandatory use.

If a truck is running on high concentrations of biodiesel the issue of cold overnight temperatures in winter and as well in the spring or the fall, becomes even more serious if the fuels are out of specification. It's prudent to ensure such fuels meet certain quality guidelines as set out by organizations such as the CGSB, U.S. National Biodiesel Board and ASTM International.

As an example, Frank talks about a 'neat' biodiesel known as B100. The primary U.S. feedstock is soybean oil, in Canada the primary feedstock is probably canola oil. He explains that even if you use a B2 (2% biodiesel and 98% diesel fuel) or even a B5 – it can have a dramatic impact on cold flow properties. Again, ensure the final blend meets specifications as defined by the organizations noted above.

"The challenge with biodiesel is it's derived from farm products and animal fats and the cloud point is typically very poor. In fact the best cloud point we've seen here at Phase Technology for a neat biodiesel is about -3°Celsius", he explains.

Whether it is biodiesel fuel or regular diesel, keeping the fuel at cloud point over an extended period of time, or cooling the fuel further, will result in extensive formation of wax solids. Fuel filters are vulnerable to plugging below this critical temperature.

"The only way to get the wax back into solution so you can drive is to add heat and the only sane way to do that is to tow the truck to a garage and let it warm up," says Frank.

Or – a fleet can make use of the cloud point analyzer, test their fuels, and completely avoid any downtime.

Definitely something to think about.

"Fleets and drivers might want to start checking with their fuel suppliers as well as the fuel they buy on the road. It's a matter of due diligence," he says.

TASK FORCE SETS GUIDELINES

Armed with this knowledge and expertise, Frank chairs three task force groups at the Technology Maintenance Council (TMC), the technology arm of The American Trucking Association. The task force groups include; Cold Flow Operability of Diesel Fuels, Cold Weather Operations and Biodiesel. The task forces' objective is to develop TMC Recommended Practices for their fleet members who operate class 2-8 commercial vehicles with operational concerns in cold climates.

For Frank, the TMC offers an opportunity to share his expertise and his Canadian company's cutting-edge technology.

ABOUT PHASE TECHNOLOGY

This small but focused company began its R&D back in the mid 1980s and by 1989 it had incorporated and was soon making its mark in the global petroleum market.

Phase Technology is now a world leader in the freeze, cloud and pour point of petroleum products. Its core business is the manufacture of petroleum analyzers.

"We perform research, design and manufacture instruments which offer the fastest and most precise test results for jet fuels, diesels, biodiesels and lubricant products. Phase Technology has the lion's share of the global market," says Frank.

Phase Technology's 30 patents in the petroleum, petrochemical and transportation markets are testaments to their success. To name a few, the company has achieved international regulatory approval and test methodology acceptance with respected organizations such as the Canadian Goods and Standards Board (CGSB), ASTM International, FAA, IATA, U.S. & U.K. military, Energy Institute (IP), ISO, JIS (Japan) and even GOST in Russia. Phase Technology is a preferred supplier in over 100 countries.

Its major customers include refineries, commercial testing laboratories, airlines and the military however its contribution to the fuel distribution industry becomes apparent when their CPA-T30

cold point analyzer is considered. The analyzer is ideal for quality control in pipelines, fuel terminals, fuel distributors, truck fleets, biodiesel blending, and for R&D purposes.

It offers high precision in a small package and provides a high return on investment.

Frank suggests that truck fleets with more than 100 trucks buy the unit as a cost-saving measure. "It may not be a purchase owner/operators want to make but then they should be asking their fuel supplier if they are testing the quality of fuel they are selling, and what other tests are they performing? Can they provide a Certificate of Analysis? Ask when that was performed and was there any co-mingling of fuels since the analysis was performed? If you have less than 100 trucks then you should put pressure on your fuel supplier to get one. It just makes good business sense and may serve as a good value proposition which fuel suppliers can offer their customers," says Frank.

The unit is economical, self contained, requires no maintenance and is very user friendly. Its ability to predict operability in cold climates can help reduce truck fleets overall fuel expenses and totally avoids any unnecessary downtime.

"The bonus is that the test data that the CPA-T30 provides helps reduce unnecessary idling and therefore reduces exhaust emissions; a great benefit to the environment."

A BUSINESS PHILOSOPHY IN TODAY'S WORLD

"The way I look at the world, the environmental movement is well and good, but fossil fuels are here to stay. We are going to use them for many years to come and so we need to burn fossil fuels more efficiently," says Frank pragmatically.

"I follow this industry very close and the key to me is to find answers to the question, how do we burn fossil fuels more efficiently? All we are going to see down the road is more and more pressure on our fuels as a resource and this technology of ours, even if it adds 1% fuel economy to consumers, is going to have a big impact," he adds.

For more information on the CPA-T30 cloud point analyzer and the company that makes it check out their website: www.phase-technology.com