

NEWS RELEASE

May 18, 2011

SwiftFuel meets new ASTM standard for testing of unleaded avgas

WEST LAFAYETTE, Ind. – A large step has been taken toward bringing an unleaded aviation gasoline to the general aviation industry.

Swift Enterprises, Ltd., based in the Purdue Research Park, has been developing an unleaded replacement for aviation gasoline for the last five years, which they call 100SF. One of the milestones in the path to commercialization of their product is the publication of a specification by ASTM International that defines their fuel.

Earlier this month, ASTM International approved a new fuel specification, ASTM D7719* Standard Specification for High Octane Unleaded Test Fuel, for Grade UL102 unleaded aviation gasoline; 100SF meets the performance parameters for Grade UL102. In order to ensure the continued safe operation of every aircraft/engine in the fleet, this specification is modeled after ASTM D910, the current specification for 100LL. Swift began development of an unleaded, high-octane replacement for 100LL (100-octane low lead) aviation gasoline because of rumors of the coming demise of the leaded gasoline. In recent months, the issue of leaded fuels being used in general aviation has come to the forefront. This has further opened the industry to searching for a viable replacement for 100LL, such as UL102. In the beginning of 2011, the FAA Administrator formed an Unleaded Avgas Transition Aviation Rulemaking Committee to focus on the current issues relating to the transition to an unleaded avgas.

“The approval of this standard is a major part of the process for getting this fuel to market,” says PJ Catania, the head of fuels certification and member of ASTM International for Swift Enterprises.

ASTM D7719 does not yet allow for UL102 to be sold at airports commercially but does allow Swift to test their fuel in non-Experimental aircraft, thereby eliminating significant time and expenses from each industry testing program. Another major advantage of a test fuel specification such as D7719 is that it ensures that test fuel delivered by Swift to individual test agencies meets the same performance parameters every time, thereby guaranteeing consistency in the tests and fuel quality. With the test fuel specification now accomplished, Swift will now focus on working with industry partners to gather additional data to transform D7719 into a commercial specification.

“Added to what Swift has already accomplished via industry testing and collaboration, we believe that this achievement proves that the ASTM process works and can be completed with the proper technical diligence and industry collaboration,” comments Mary Rusek, president of Swift Enterprises.

* - ASTM D7719 will be made available for sale through ASTM International in the coming weeks.

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About Swift Enterprises Ltd.

Established in 2001, Swift Enterprises (<http://www.swiftenterprises.com>) works with novel chemicals as new components in energy conversion devices. Swift brings a combination of military, academic and private enterprise experience to the practical research and development of propulsion, ordnance and power technologies. In the mid-1980s, the company's founders worked at Edwards Air Force Base in California, where they conducted research on rockets and rocket fuel for the government. Swift Enterprises has completed research for Lockheed-Martin Astronautics, DARPA, the U.S. Air Force and the U.S. Navy.

About ASTM International

Founded in 1898 as the American Chapter of the International Association for Testing and Materials and most recently known as the American Society for Testing and Materials, ASTM International is a not-for-profit organization that provides a global forum for the development and publication of voluntary consensus standards for materials, products, systems and services. ASTM standards are accepted and used in research and development, product testing, quality systems, and commercial transactions around the globe.

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Swift Fuel Moves Forward With ASTM Standard

May 23, 2011

By *Mary Grady*,
Contributing editor

Swift Enterprises, which is working to create an alternative aviation fuel to replace 100LL, said this week it has taken "a large step" forward in the approval process. ASTM International has published a new fuel specification for Swift's UL102 high-octane unleaded test fuel. "This will allow us to test every batch of a fuel to a standard, and verify that it is all the same," PJ Catania, the head of fuels certification for Swift, told AVweb on Monday. That consistency is important for completing the next phase of testing, he said. It also will enable the company to test the fuel in standard airplanes, rather than only experimental aircraft, which will make it easier to gather large amounts of data, Catania said. However, that phase of testing the fuel in standard airplanes is still at least six months away.



First, the company must get the okay from engine manufacturers to use the Swift fuel, he said. They are now in discussions with Lycoming, Continental, and Rotax, as well as some smaller manufacturers. The "biggest thing" about this week's announcement, Catania said, is that it shows the company is continuing to make positive progress with the ASTM process, even though it's slow. He said the FAA's creation earlier this year of an Aviation Rulemaking Committee to address the transition to unleaded avgas will help to define the path forward. A public forum with that committee, scheduled for EAA AirVenture Oshkosh this summer, should help clarify how new fuel alternatives can move through the process from the testing phase to offer a commercially available lead-free avgas.

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Media-Induced Greenwashing

May 25, 2011

By Paul Bertorelli

Trying to make sense of where the aviation fuel market is going can make your head hurt, and we in the aviation press often don't help. Specifically, we continue to perpetuate the idea that Swift Fuel is a "green" renewable when, in fact, the company has plainly said that's just one possibility. Herewith are two examples:

In [this video we aired in March during our Sun 'n Fun coverage](#) — scrub ahead to about 1:10 for the relevant point — our source says Swift is a biofuel and green because it doesn't contain any lead. If that's true, unleaded premium at the corner Hess station must be green, too, because it has no lead. I filmed this report myself, heard the biofuel statement and neither challenged nor clarified it. Thus goes modern journalism, where we use the excuse of lack of time to let statements we suspect may be misleading slide right by to be taken as factual by the reader or the viewer.

In [this report from AOPA's recent coverage of Aero Friedrichshafen](#) — scroll ahead to about the 2:55 mark — the reporter goes beyond leading the witness and just flat out states that Swift is made from biomass. Swift's Jon Zuilkowski replied that Swift can be made from biomass, but if you listen critically, he doesn't say precisely that it is or has been. He talks about estimated yields from various crop sources in a theoretical sense because, in reality, Swift hasn't carried or proven the biomass-to-fuel process end to end at a large scale. It has produced small quantities for test purposes straight from raw sugars, but just a few gallons. (He also misspeaks on yield, saying that a bushel of sorghum produces 100 gallons of Swift Fuel; he meant to say a ton of sorghum, I suspect. I asked him about it, but he said that's not Swift's area of expertise. It's being done by others.)

The larger volumes of Swift fuel for aircraft testing have been produced with off-the-shelf chemicals that aren't bio-derived. Swift recently reported that it's just now engaging companies to prove out the biomass economics at a larger scale from various crop sources. To its credit, Swift has generally explained this accurately, at least to me. But if a reporter doesn't ask the right questions, he or she is left with the impression that Swift is a biofuel when, in fact, it's more reasonable to say, as Zuilkowski did, that it could be a biofuel. The difference is neither subtle nor unimportant for its price as a biofuel will hinge on processes that Swift is not doing.

Swift has been less consistent in its cost estimates. For example, in the AOPA report, Zuilkowski says the partner companies they have engaged estimate that they can produce Swift Fuel for half the production price of 100LL. This is a tall claim that I am skeptical of for a number of reasons. First, what production price are we talking about?

At the refinery gate, avgas has been as low as about \$2.50 not so long ago, but now it's more like a buck above premium car gas, so call it in the mid \$4 range, according to my refiner sources. Just as a handy guide, to thumbnail price refinery gate gasoline prices, start with any index crude you'd like—say West Texas Intermediate or Brent—divide by 42 and add 30 percent to get to premium car gas. Add another buck for avgas.

But using it as a benchmark, half would be about \$2.25 to \$2.50 out of the refinery, which is about a dollar less than premium car gas is now. To give you a frame of reference, according to the U.S. Energy Information Administration, the well-established ethanol industry with benefit of considerable economy of scale, struggles to make ethanol at \$2 a gallon and that's with a 45-cent-a-gallon government subsidy. A bio-derived Swift fuel requires a more difficult and unproven cellulosic process to reduce biomass to sugars, then bacteria to make the sugars into acetone, Swift's basic feedstock. Swift has been clear that its work has centered on the acetone-to-fuel conversion process, not the equally critical biomass-to-acetone conversion, which it's leaving up to other companies.

It's always possible that Swift's contractors have made huge breakthroughs, but I'd like to see these before accepting the claims at face value. In the ethanol market, cellulosic technology has been intensely hyped, but so far, it's been a bust. The EPA has backed off on its goals for cellulosic ethanol as a gasoline blendstock. "Half-price" fuels suggest near order-of-magnitude improvements in efficiency and yield. Renewables are making progress, to be sure, but we're standing by to see if they've made these kinds of gains. I'd never say never, but I would say: show me.

In [this podcast last year](#), Swift's David Perme told me he thought Swift Fuel could achieve a retail price point between \$5 and \$6 if it used acetone feedstock derived from natural gas. As has Zuilkowski, Perme said most of Swift's work has centered on the end-state technology—the task of converting acetone into one of the binary components of Swift Fuel, mesitylene, which is blended with isopentane to make the finished fuel. Perme's numbers were based on petrochemically derived acetone because those economics are easier to pin down.

So it seems to me that the right way to think about Swift is as a binary fuel derived from acetone feedstock and not as a biofuel. The acetone can be bio-derived, but if it is, it will have to compete with petrochemically produced acetone whose prices have proven wildly spiky due to variable demand in the plastics industry. Acetone squeezed from sweet sorghum won't be insulated from that nor does it seem likely that enough of it will be produced to impact world commodity prices for this material. In other words, unless Swift segregates its ultra-cheap acetone from world commodity prices, its investors won't want to leave any money on the table just for the good of aviation.

But we'll see.

I follow the energy markets loosely, both because it's a personal interest and because it relates to avgas. Last month, this minor chemical industry news item caught my eye: Dow plans to construct a "world-scale" propylene production facility at its Texas operations for a start-up in 2015. Why is this of interest? Because propylene is the primary feedstock for acetone, which Dow is evidently bullish enough on to take a run at the global market. One reason they are doing this is because the Marcellus Shale formation in Pennsylvania and the Eagle Ford shale in Texas are spewing out massive volumes of natural gas and related products, with yields expected to increase, with predictable effect on prices. Propylene can come from natural gas liquids, but the shales don't have much of that. Dow evidently has technology to make shale-derived gasses a player in this market.

So that means renewable sorghum-produced acetone may have to compete with a great gush of propylene-derived acetone. When Swift gets around to attracting investors, they'll no doubt take notice of this and won't have much choice but to pick the cheapest acetone they can find. That might be bio-acetone. Or not. It will be interesting to see how it plays out. To the Swift process, it doesn't matter where the acetone comes from.

In the meantime, Swift continues its research, tweaking its process and testing the fuel. ASTM approval for its fuel is near completion, a real plus. The company gives regular updates at the major shows, with AirVenture up next. They freely answer questions from the audience and I encourage you to ask the right ones. We in the media don't always do that.

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