NANO VAPOR
FUELS GROUP

Aviation Services

World Class Degassing Solutions

July, 2011

18 Augusta Pines Drive
Spring, TX, 77389
832-220-6211
www.nanovapor.com

Purging Delays Create Unnecessary Expenses

New Technologies offer alternative solutions to outdated processes with immediate benefits to the end users.

Revolutionary Degassing Technologies

NanoVapor Fuels Group (NFG) offers to market a combination of systems to manage the creation and release of Volatile Organic Compound (VOC) gases generated by Jet-A, JP-8 and all aviation fuels during fuel cell degassing operations. NanoVapor offers two technologies that may be utilized separately or in series, dependent upon client needs. NanoVapor's two product offerings are designed to create specific advantages to address the key market drivers of safety and chief asset downtime. Our suppression technology takes a unique approach, virtually eliminating vapor creation before it starts – no vapors, no problem. NanoVapor offers maximum removal using technologies to allow man entry in a fraction of the time currently required. Our absorption technology acts as a control device, capturing >99% of all vapors routed through the system.

The Problem

During the fuel cell purging process, maintenance crews are left stranded, unable to perform any work on the aircraft. Current practices route fresh air through the cells until the LEL levels are within the regulated range for safe man-entry. Utilizing these practices, this downtime is often between 8-16 hours or more. With new aircraft valued at $100-$350 million, this downtime translates to significant financial burdens.

The Solution

NanoVapor technologies offer cost effective, zero-emissions solutions to VOC remediation. Though the two technologies approach the situation from entirely different directions, both are highly effective and offer a multitude of benefits to the end user. By eliminating conventional practices, we offer safer, faster VOC degassing technology with significant financial and environmental benefits.

Vapor Creation can be Slowed or Stopped

Vapor Suppression Technology (VSS)

NanoVapor Systems Turn Degassing Operations from Cost Center to Profit Center.

VSS Technological Description

Connected at the inlet to fuel cells, the VSS system (patent pending) is designed for immediate reduction in VOC vapor presence and live residual fuel vapor suppression. The system uses a pressurized injection system which projects a vaporized chemical compound into the void tank space above a fuel product. The chemistry, now at molecular level, seeks to absorb hydrocarbons in the saturated vapor space. This chemical shield binds in a chain with the present hydrocarbons, collecting on the surface of the tank and its stored product, forming a barrier several molecules thick, and suppressing the creation of further VOCs. This not only reduces the risk associated with vapor generation, but also reduces costs and time (lengthy degassing operations).

Fuel Cell Degassing

NanoVapor has defined this market as including cargo carriers, commercial jets, private jets and military aircraft. These aircraft must undergo routine and unscheduled maintenance throughout their operation.

Degassing these fuel cells currently uses blowers that blow fresh air into one side of the fuel cell, which causes fuel vapors to be released out of the other end, typically into a hanger. These vapors are sometimes inhaled by workers in the hanger, causing headaches.

NanoVapor currently holds No Technical Objections from the FAA and the DOT for use of this suppression technology. The absorption process takes place as the volatile vapors exit the tank, entering NV's scrubbing unit for total suppression of all fugitive emissions.

NanoVapor Vapor Suppression System (VSS)

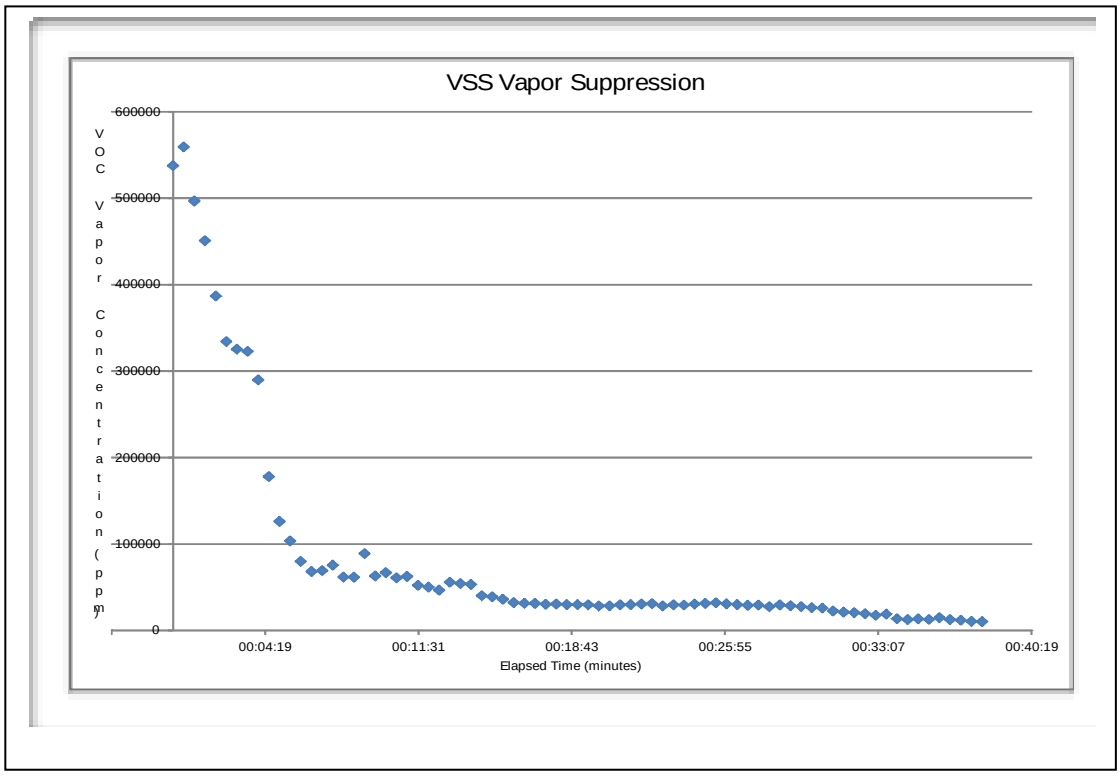
- Suppresses vapor generation for C4-C20
- FAA / DOT verified
- Forms molecular barrier
- If barrier is broken, chemistry immediately forms a new barrier
- By stopping the vapor growth early, less product is lost to vapors and there is less of a VOC problem to fix
- Maintains barrier for long periods of time

Vapor Handling Time Significantly Reduced

Vapor Suppression Technology (VSS)

The suppression effectiveness of the VSS technology is illustrated in the graph below. This technology has received No Technical Objection's work documentation (NTO's) from the FAA and the DOT for use in commercial aircraft, confirming its effectiveness without contaminating the product or systems.

GRAPH 1: Gasoline Vapor Suppression Test



High Performance: In a vessel containing refined gasoline, a dramatic reduction in VOC concentration from 550,000ppm to roughly 10,000ppm was achieved over a period of 40 minutes, at a temperature of 39C°. A longer period of exposure shows ppm concentrations continue on a declining curve.

No Longer a Need to Release Vapors

Vapor Absorption Technology (VAS)

Vapor Absorption System

This patented technology utilizes custom designed vapor fluidizing technology to maximize vapor-to-liquid contact. With this high contact level, NanoVapor's absorption chemistry forms bonds with the hydrocarbons present, pulling them from the ambient vapor.

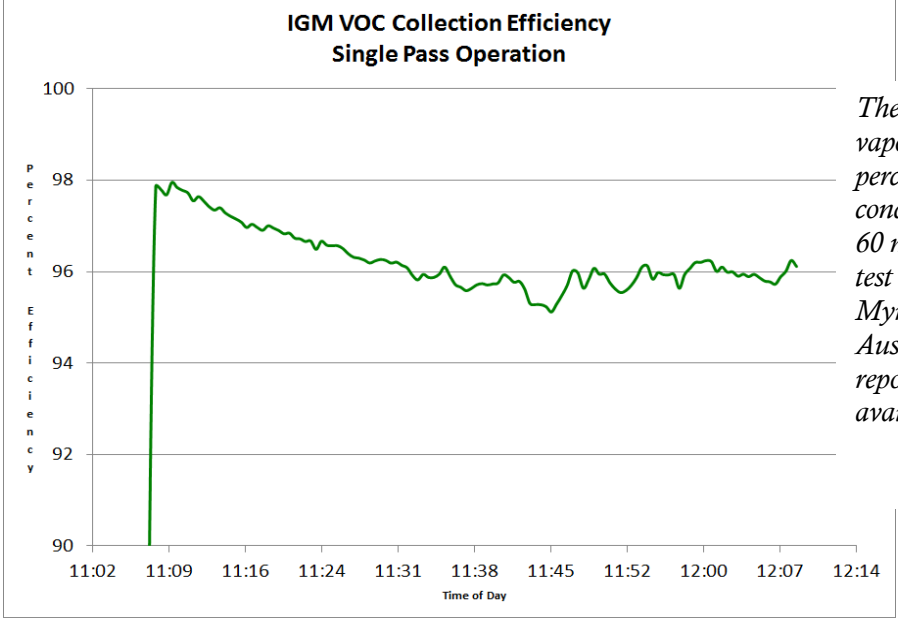
This system may be designed as a single pass or recirculation system. As a single pass system, this scrubber will operate at greater than 95% capture rate. To achieve >99% capture efficiency, Nanovapor must operate the system in an easily configured recirculation cycle.

Competitive Comparison

Current practices do not address VOC remediation, relying on connectors and hoses to simply route these VOC vapors away from the work zone. NanoVapor's process, however, minimizes the release of these vapors through the application of our two unique technologies.

Traditional degassing technologies are limited in their vapor space turnover rates by flow rates and pressure limits. NanoVapor's suppression systems are not limited by these customary factors, relying rather on its ability to form chemical bonds with the hydrocarbon vapors. The chemistry has been tested effective on all VOCs with carbon chains C4-C20, with similar efficiency curves to that seen in Graph 1, on the previous page.

GRAPH 2: VAS Efficiency



The graph illustrates vapor capture as a percent of inlet concentration during a 60 minute test. This test was monitored by Myramid Analytical, Austin, TX. Detailed reports of this test are available upon request.

New Solutions Offer Quantifiable Results

NanoVapor Degassing Technologies

Summary

NanoVapor Fuels Group, Inc. now offers first-of-their kind technologies to deliver aircraft maintenance operators an immediate competitive ability to improve safety and efficiencies from fuel cell degassing and refill procedures. These results are delivered in the form of improved environmental impact, lower health and safety risks, and new revenue opportunities and reduced expenses through significant time savings. NanoVapor solutions offer our customers multiple operational and financial benefits.

Direct Benefits:

Time Savings – Our Vapor Suppression Systems result in significant time savings over the competition, reducing fuel cell purging operations from 8-16 hours per plane to less than 2 hours.

Asset Utilization – Planes require less down time and hanger time usage per plane is reduced.

Vapor Removal – Though our suppression technology reduces the vapor presence over a short period of time, our absorption systems are designed to immediately eliminate vapor presence entirely.

Indirect Benefits:

Cost Savings – Maintenance requiring the purging of fuel cells creates significant expenses as well as lost revenue. Current methods may require 12-18+ hours prior to man-entry. NanoVapor will complete the same process in less than two hours. This reduction in time translates to more efficient asset utilization while minimizing costly delays in service.

Environment / Health – Benefits from the reduction in pollution levels are expected to resonate throughout the local community, from neighbors to employees, to environmental activists and regulatory agencies.

Safety – Reduces the chance of fire or explosion. May reduce insurance costs.

Call NanoVapor Fuels Group to learn more about the technology and its specific benefits to your company. 832.220.6211

Frequently Asked Questions

Does this chemistry contaminate the product in any way?
The chemistry used in NanoVapor's Vapor Suppression System is perfectly safe for use on all fuel products. This technology has received No Technical Objections (NTOs) from the DOT and FAA for use on aircraft fuel bladders as well as being purchased and deployed by the UK Ministry of Defense. Product MSDS is available upon request.
Our Absorption chemistry does not come in contact with any product that may be utilized in aircraft cells. Therefore, it cannot contaminate the product or fuel cell in any way.

Does the product require permits or licensing for transportation?
The chemistries are non-hazardous liquids that require no licensing or permits.
NanoVapor is currently exploring new alternative chemistries, and will relay any permitting changes, should any arise, if the customer chooses to use these new chemistries.

What products can the systems degas?
The technologies are known to be successful when degassing vapors C4-C20. NanoVapor is now testing compounds with a wider range of carbon chains.

How does the system work?
Our Vapor Suppression System works by injecting our chemistry into the fuel cell vapor space through specialized insertion techniques. The chemistry then settles above the liquid product level, forming a molecular barrier between the product and the vapor space above. The chemistry in vapor form, will bond to VOC vapors already in the vapor space, and then drop back to the fluid (fuel product).

The Vapor Absorption Scrubber routes VOC vapors to a control device, whereby these vapors are routed through proprietary fluidizing materials to maximize surface area within the absorptive liquid. This liquid creates chemical bonds with the carbon atoms, removing them from the passing vapors.

How is the "Value Generation" calculated?
Value Generation has been calculated based on time savings and a number of affected factors. These factors include, but are not limited to; reduced expenses (hanger time, maintenance crew downtime, and chief asset downtime) as well as opportunity for increased revenue by getting the asset online faster. Further value may be generated in large carriers, where time savings may translate to the need for fewer aircraft. For further details of value generation please contact our management team. We will work with you to calculate your specific value generated.

History and Contact Information

Our History

NanoVapor Fuels Group has had its suppression technology validated and available for the past decade, refining and improving the delivery system and chemistries for different client needs. NanoVapor has received documentation for No Technical Objections (NTOs) from both the FAA and DOT. Our technologies have been used in operation by the Ministry of Defense and others, degassing fuel bladders and airplane fuel cells. A technical video of the NanoVapor system in use can be seen here:
http://www.nanovapor.com/aviationvideo/php

NanoVapor has further developed additional solutions for VOC remediation through the use of patented absorption technology. This technology has been in development for several years, with our first live demonstration, in front of an audience including industry veterans and members of the TCEQ, considered a resounding success. NanoVapor experienced capture rates of 95%+, greatly exceeding requirements set forth by the TCEQ. With further research and adjustments to further increase capture rates, this technology is now ready for market entry.

Jim Rice
CEO
501.467.4221
jim@nanovapor.com

Elliott Moorhead
CSO
831.685.1148
eim@nanovapor.com

Gary Wilkinson
President and CFO
832-317-8554
gary@nanovapor.com

18 Augusta Pines Drive
Spring, TX, 77389
Phone: 832.220.6211
www.nanovapor.com
info@nanovapor.com