



RWR Pilot Training



Malibu - Mirage - Meridian

*Insurance Approved Initial & Recurrent Training Programs
Designed to Make Your Flying Safe and Enjoyable
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I'm Glad You Asked

The Importance of Fuel Additive

By Dick Rochfort, ATP, MCFI, CFII, MEI

QUESTION – What are aviation fuel additives and what is the correct way to use them?

ANSWER – In the late 1950's, as more jet aircraft were flying to higher and higher altitudes for longer times, problems started to develop with ice crystals forming in Jet fuel.

Fuel System Icing Inhibitors were introduced to military aviation fuels in the early 1960's after the crash of a B-52 in 1958 attributed to ice in the fuel causing five (5) of the eight (8) engines to fail due to fuel starvation.

It was quickly discerned that as a hydrocarbon fuel, such as Jet Fuel is cooled, one (1) part per million of water comes out of solution from entrained water to free water. As dissolved water in fuel becomes FREE water when the fuel is cooled, it can form solids (ice) in freezing temperatures. Obviously, as the water temperature falls and changes into ice, these ice crystals can inhibit fuel flow and can possibly starve the engine for fuel.

For this reason, some aircraft utilize fuel heating systems to melt any ice that forms at altitude, while other aircraft require the Fuel System Icing Inhibitor (FSII) additive, PRIST® Hi-Flash™ to ensure safe flight.

Initially, Prist® was an Ethylene Glycol compound delivered blue in color but in the mid 90's, was changed to PRIST® Hi-Flash™, a clear DiEthylene Glycol to offer an improved higher flash point and reduced hazardous and toxic characteristics.

All turbine aircraft fuels contain some dissolved water. It cannot be extracted because it does not exist as particulate water. When an aircraft rises to flight altitude, the fuel cools and its capacity to retain dissolved water is reduced. Some of the dissolved water separates out as discrete water that can form into ice crystals or remain as a super-cooled liquid.

When super-cooled water strikes a tubing bend or a filter, it can freeze quickly and block a fuel line or filter. If suspended ice crystals are present, they can also block a filter.

Prist Hi-Flash anti-icing aviation fuel additive controls icing in aircraft fuel by depressing the freezing point of water.

Prist Hi-Flash additive has limited solubility in jet fuel, but is completely soluble in water. When dissolved water separates from the fuel, some amount of Prist Hi-Flash additive quickly leaves the fuel and preferentially dissolves in the water. This depresses the water's freezing point. As the fuel gets colder, and more water particles appear, more Prist Hi-Flash additive leaves the fuel and enters the water, and your aircraft's fuel lines stay clear.

PRIST HI-FLASH can be added to all jet fuels (Jet A, Jet A-1, JP-5, JP-8) for use in all types of turbine powered aircraft (fixed wing and helicopter).

Fly Safely – Train Often

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PRIST HI-FLASH should also be added to all grades of 'AvGas' (80/87, 100/130 and 100LL) for fueling any aircraft operating in extremely cold climates or in aircraft that are flying in freezing temperature for extended periods of time.

PRIST® Hi-Flash™ Fuel Additive meets ASTM D4171 and MIL-DTL-85470 (Current Revision Issue) specification for DiEthylene Glycol Monomethyl Ether (DiEGME). The primary purpose of this chemical is to prevent freezing of water in the fuel system of aircraft. It is this property that is covered in ASTM and/or Military specifications. Neither of these specifications contains any biocide requirements.

Prior to 1994, PRIST® was made to a Military Standard MIL-I-27686, which specified Ethylene Glycol Monomethyl Ether (EGME). Provisions were made to have this product certified as a pesticide with the EPA. This allowed the product to be advertised as having the ability to retard growth of microbes in aviation fuels. The correct term is for the additive is microbiostat (-stat means it controls or retards growth by putting the microbes in a static condition), it is not a true microbiocide, (-cide means it kills microbes).

With all of the new EPA requirements, it became economically prohibitive to certify the new DiEthylene Glycol Monomethyl Ether, DiEGME based additive as a pesticide. Summarizing the above, it is widely believed that DiEGME does have a retarding effect on microbial growth; however, we no longer officially claim this property for the PRIST® Hi-Flash™ Fuel Additive.

I hope this information is helpful.

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"I'm Glad You Asked" is a regular column written by Master Flight Instructor Dick Rochfort. Dick answers questions which come up frequently while conducting training in the Malibu, Mirage and Meridian aircraft. If you have a question for Dick, you can send it to him at mail@rwrpilottraining.com. He'll be ... "glad you asked".

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Biography

Richard W Rochfort



A former corporate pilot and primary flight instructor, Dick is a full-time Master Certified Flight Instructor providing insurance approved initial and recurrent pilot training in the Piper PA46 Malibu, Mirage, and Meridian aircraft. He is currently flying over 450 hours per year and trains 60-80 pilots every year exclusively in these aircraft.

He holds multi-engine ATP and Gold Seal Flight Instructor Certificates with CFII, MEI and CE-525S ratings. He has been actively involved in flight training since 1991 and has trained pilots all over the US, Canada and Europe.

Dick is an Aviation Safety Counselor for the FAA Baltimore FSDO, a National Industry Member of the FAA Safety Team (FAAST) and has conducted hundreds of programs for the pilot community. He is an instructor for the M/MOPA Safety and Training Foundation and The National Association of Flight Instructors has designated him Master CFI. Less than 1% of all flight instructors have earned this designation.

Dick served as a Staff Sergeant E6 in the US Army Special Forces from 1970 until 1976 as an A team radio operator, training indigenous personnel in field communications. He worked from 1976 until 1991 as an industrial engineer training manufacturing personnel for the production of communication and navigation equipment for US military.

His education includes undergraduate degrees in Clinical Psychology and Engineering and a Masters Degree in Business Administration. Dick lives in Baltimore, Maryland with his wife and two daughters. He is a PADI Certified Scuba Diving Instructor, First Aid Instructor and an Eagle Scout.

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