



U.S. Department
of Transportation
**Federal Aviation
Administration**

Advisory Circular

Subject: WATER IN AVIATION FUELS

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Initiated by: AFS-340

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Change:

1. PURPOSE. This advisory circular (AC) alerts the aviation community to the potential hazards of water in aviation fuels. In addition, it outlines recommended procedures to prevent, detect, and eliminate water in the fuel systems of aircraft.
2. BACKGROUND. Water in fuel continues to contribute to aircraft incidents and accidents and, at times, fatal accidents. Aviation fuel can only serve its ultimate purpose if it is delivered to the aircraft engines(s) free from water. Care and attention are necessary to keep fuel dry (free of water) during transportation from the refinery, storage at airports, storage in refueling equipment, dispensing from refueling equipment into the aircraft; while in the tanks of an aircraft, and from the aircraft tanks to its engine(s). Accordingly, if all persons involved in fuel handling will accept their responsibility to keep fuel dry, water-in-fuel incidents and accidents can be prevented.
3. SOURCE OF WATER IN AVIATION FUEL.
 - a. Water can enter an airport fuel system through leaks in underground tanks, leaks in the seals of such items as dome covers, floating roofs, and hatches during rain or snow storms, when equipment is being washed, by marine or surface transport equipment delivering fuel to the airport, and by condensation and precipitation of dissolved water in fuel.
 - b. Water can enter an aircraft fuel system through leaks in the vents, seals, or poorly fitting fuel caps on filler openings during rain or snow storms or when the aircraft is washed, from refueling system equipment, by condensation and precipitation (especially when an aircraft has partially filled tanks), and when refueling during rain or snow storms.
4. WATER. Water occurs in aviation fuels in two forms: Dissolved and free.
 - a. Dissolved Water. All aviation fuels dissolve water in varying amounts depending upon the fuel composition and temperature. Dissolved water in fuel is similar to humidity in air.
 - (1) Lowering fuel temperatures will cause dissolved water to come out of solution as free water somewhat like fog comes out of air. The creation of free water occurs at a rate of about one part per million per degree fahrenheit (1 ppm/deg. F).