

DETERMINATION OF UNDISSOLVED WATER IN AIRCRAFT TURBINE FUEL - SHELL WATER DETECTOR

(This EO replaces EO 00-50-21 dated 15 May 63)

1 Free water may exist in turbine fuels as a very fine dispersion which, while it may give the fuel a cloudy appearance, after a short settling time it can be difficult to see with the naked eye and may not be detected by paste or paper because of the droplet size and concentration.

2 This condition can be caused by the passage of fuel containing larger water droplets or slugs through a pump or filter. Settling times for these very fine particules are uncertain.

3 The Shell Water Detector has been developed to guard against delivering fuel containing finely divided water particles not normally capable of detection by water finding paste, or visual methods. With the Shell syringe kit or equivalent, positive indications of water can be detected at concentrations of less than 30 parts per million. Fuel water filter strippers to Spec. GHE18-1 when properly installed will deliver fuel with no free water. The use of this detector will indicate presence of water down to 10 PPM. If the filters/strippers are defective or improperly installed the fuel dispensed will contain water far in excess of 10 to 30 PPM, therefore the purpose of this syringe kit is to detect malfunctions of improper installation of the filter stripper separators. Any reading of positive water indication is to be retested using care to follow instructions exactly as contained herein. When three retests continue to indicate 20 PPM, or over, fuel is unacceptable and must be recirculated through serviceable water stripping equipment prior to use. The Detector consists of three parts:

- (a) A standard 5 ml. nylon hypodermic syringe.
- (b) A plastic detector cap in which is fitted water sensitive paper.
- (c) A colour Intensity Indicator Card.

USE OF THE DETECTOR

4 Draw a 5 ml. sample of the fuel to be tested through the detector cap fitted to the syringe. The cap and approximately half of the syringe should be immersed in the sample under test. Any droplets of water in the fuel coalesce on the paper fibers, dissolving and spreading the dye, and producing a distinctive colour change to medium, dark green. The portion of paper protected by the plastic moulding remains unchanged. A positive difference in colour between the outer and inner portion is an indication that water is present and the fuel fails specifications.

NOTE

A detector cap should only be used once and then discarded because the sensitivity of the device is a function of the quantity of fuel passed through the paper.

Containers of detector caps should always remain covered to prevent discolouration by atmospheric humidity.

TRAINING IN USE OF DETECTOR

5 Fuelling crews should be shown the operation and sensitivity of the detector.

STORAGE LIFE - DETECTOR CAP

6 The storage life of detector caps is now nine months from the date marked on the bottom of each tube of capsules. Time expired stocks to be discarded or may be used for training purposes. Units must compute quarterly consumption and order accordingly to prevent overstocking and causing waste.

NOTE

Tubes must be stored in dry area and remain tightly capped.

APPLICATIONS AND FREQUENCY

7 The detector will be used to check samples of aviation turbine fuels drawn as follows:

- (a) When a refuelling tender is suspected of water contamination - Tender must have fuel recirculated through dispensing nozzle or a minimum of 25 gals drawn or dispensed from nozzle before sample taken. After a minimum of 25 gals has been pumped from tender take a sample of fuel in clean dry container (preferably glass jar for visual purposes) and then proceed to make Shell syringe test as outlined in paragraph 4.
- (b) If sample is taken from A/C fuel tanks ensure sample is a true specimen of the tank contents and not the results of tank settling at drain cock. Fuel sample must be agitated before sampling.
- (c) Fuel sampling can be taken at any time, water contamination is suspected, sample to be taken from any dispensing unit downstream of filter/stripper unit.
- (d) The use of the Shell Syringe Kit once each month, or more often if required, to check the efficiency of each refuelling tender is to be undertaken as a means of check monitoring the proper normal operation of the filter stripper units and fuel tender maintenance.

8 The Shell syringe kit is quite true reading and will provide a means of testing for entrained water contamination reading when used precisely as directed and will not provide an indication of water that has settled. Water finding paste is to be used to determine the presence of water that has settled.

ISSUED ON AUTHORITY OF THE CHIEF OF THE AIR STAFF

Prepared by:
AMC/SOLM/M3