

THE SHELL WATER DETECTOR KIT ®

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The Problem

Water can occur in jet fuel in three forms, dissolved (chemically in solution in the jet fuel), settled (as in free water at the bottom of the tank), or as finely dispersed undissolved water held in suspension. It is this undissolved water that the Shell® Water Detector is designed to detect, and it has proved to be reliable for 30 years. This is water that a filter separator can remove, and is usually invisible to the eye in quantities below 40-60 ppm.

What it Does

- Detects the presence of finely dispersed undissolved water in jet fuels.
- Works at free water concentrations below those which can be seen by the human eye.

What it Consists of

- A plastic detector capsule in which is fitted a disc of filter paper treated with water sensitive chemicals.
- A graduated plastic syringe and special connector for the capsule. The syringe must be ordered separately.

How to Use it

- Take a capsule from the tube and check that it is a uniform yellow color. Do not touch or breathe on the paper surface of the capsule.
- Push the syringe plunger fully in, then fit the capsule to the syringe and immerse the capsule and part of the syringe in the fuel.
- Draw the plunger back steadily until the fuel in the syringe reaches the 5 ml mark. *
- Examine the capsule for difference of color between the inner wetted center ring and the outer rim.

How to Interpret Results

- The presence of free water in fine suspension in the fuel is indicated by a change in color on the center of the capsule.
- The chemicals begin to react at the very low concentrations of water contamination, even below 10 ppm. The color changes become progressively more noticeable with increasing water concentrations until, at approximately 30 ppm, with a 5 ml sample, a strong, obvious green color is obtained - giving a positive indication of the presence of free water.
- At free water concentrations below 30 ppm, yellow/green colors are obtained. These colors progress through green to blue/green and finally blue/black at very high free water concentrations.



Applications

The Shell® Water Detector can be used to check samples for water in fuel immediately after collected from:

- Periodic testing of inlets and outlets at filter vessels.
- Transport trailer tanks - white bucket samples
- Storage tank bottoms and cuts at different levels
- Refueler tank and filter sumps (especially after rain, truck washing or defueling).
- Hydrant cart filters.
- Fuel farm tank and filters.

* NOTICE - To obtain the same reaction from only 15 ppm of water, use our 10 ml syringe. See Ordering Information. Do not attempt to use 2 draws of a 5 ml syringe because the result will be in error as a result of stopping flow in the middle of the test.

Limitations on Use

- Each detector capsule can be used only once. Capsules must not be reused even if they detect no water on the first test.
- Capsules have a specific expiration date (month/year), stamped on both the box and the bottom of each tube. Capsules should never be used after the end of the month of expiration because the response to free water may be reduced below reliable levels.
- This tester will not accurately measure water content in a sump drain sample. See **CAUTION** at bottom of this page. Visual inspection is more appropriate for sump tests.
- Syringes may be reused as often as necessary but may get stiff in time and difficult to use.
- Capsules will only work on jet fuels. They will not work reliably with lighter (Avgas) or heavier (diesel) fuels.
- Slight variations in manufacturing and the fact that the chemicals used are sensitive in their response to different sizes of water droplets prevents this tester from being useful to determine exact water levels. This test should be used as a go/no go method. Results should be either *negative* (no color response), *positive* (noticeable green color) or *trace* (slight color). See "How to Interpret Results",
- The response of the detector capsules to free water is not affected by the presence of additives such as conductivity improvers (such as Stadis 450®) and anti-oxidants but can be affected by anti-icing additives (Prist ®, EGME, FSII). This is because these additives affect the composition of the water. Some corrosion inhibitors (especially those of an alkaline nature) may affect the accuracy of the capsules. This has not been fully investigated but experience to date indicates no problem. *In general*, additives do not mask the reaction of the capsules to *significant* concentrations of free water.
- The capsules are not accurate if less than 5 ml. of fuel is drawn into the syringe.

Precautions

- Replace the screw cap on the tube immediately after taking a capsule out for use to protect the remaining capsules from atmospheric humidity.
- Do not leave unused capsules lying around or in pockets for later use. select the capsule immediately before use.
- Do not discard the silica gel tablet in the bottom of the tube until all capsules have been used. It is there to protect the remaining capsules from humidity during storage.
- Use only nylon or polythene syringes. The majority of conventional syringes are made of polystyrene which is adversely affected by fuel. Syringes with rubber bulbs are also unsuitable.

CAUTION

The Shell® Water Detector, or any other water detector, cannot measure water content accurately from a sump sample unless the sump is flushed thoroughly. However, a dry sample taken from an unflushed sump is a good indicator of a dry system.

Shell water detector test

- Beware of results obtained from aircraft tank drains. Such samples will often contain free water caused by cooling of a new load of fuel delivered into the cold aircraft. Because of this, a positive indication of free water in an aircraft tank drain sample after fueling does not necessarily indicate free water during delivery.
- Any communications concerning questions of performance or accuracy of the Shell® Water Detector should include the expiration date, the code number on the box and the nature of the test performed.

Health Hazards

Detector capsules contain toxic materials and should be kept away from the mouth, food or drink.

Packaging and Life

- Detector capsules are packaged eight to a tube, ten tubes to a box (80 capsules per box).
- Shell® Water Detector capsules have a shelf life of 9 months from manufacture. Due to import and shipment considerations there is a useful life of four to six month after shipment from our inventory. We recommend you order no more than three month supply at a time. Blanket order releases are available, automatically shipped on your schedule. This reduces possibility of being left with expired capsules, or running out.

Ordering Information

Shell® Water Detector Kit (80 tests)

Nylon Syringe, 5ml.

Nylon Syringe, 10ml.