FUELSTAT®

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Instructions

FUELSTAT® *One*

This FUELSTAT® *One* test kit detects microbiological contamination in aviation, diesel and other middle distillate fuels.

The test is based on protein-ligand complex formation, targeting a mix of carbohydrates from a broad range of micro-organisms found in fuels, in a simple, rapid test that gives quantitative results on-site in 25 mins.



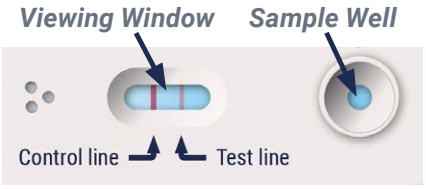
Each test kit contains:

- Test Cassette: Plastic base with a lateral flow device affixed in a heat sealed foil pouch
- Test Bottle: 175ml bottle containing 2.0ml of blue extraction fluid with cap and "dropper cap"
- Single use 20ml syringe & extraction tube, 2.0ml syringe & sample cup
- Instruction leaflet

Note: a FREE FUELSTAT® Result app reader is used for the digital interpretation of the result. The use of the app is necessary to obtain a fully quantitative result (page 3).

The test measures overall microbial contamination (bacteria and fungi) which grow in aviation, diesel and other middle distillate fuel types and have potential to block and damage fuel systems.

The test contains a sample well and viewing window. Results are shown by a Test Line (T), with a Control Line (C) to confirm the validity of the test.



Test Bottle:



SAMPLE PREPARATION ADVICE

A microbiological test is only as good as the sample which has been taken. It is recommended that industry standards and guidance material such as ASTM D7464 & D6469 are followed.

Take a sample from the lowest point of any tank or fuel delivery system. This is most likely to give the most representative result of microbiological contamination. It is important that a clean sampling container* is used to minimise the risk of cross contamination. If using the same sampling equipment for multiple samples each item used should be cleaned prior to re-use with no less than 70% alcohol wipes (or other sterilisation method) and left to dry before reuse.

*HDPE Sampling Containers are industry standard

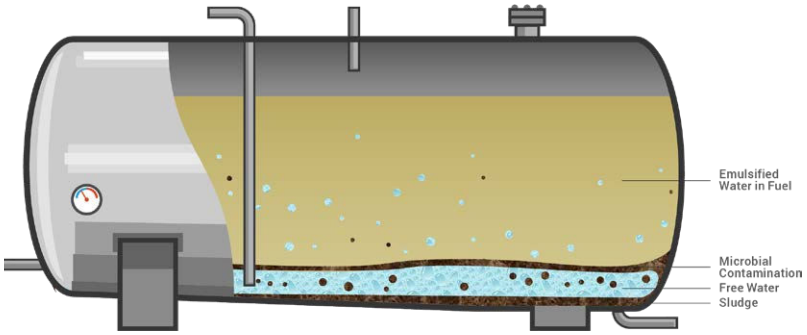
To perform the FUELSTAT® test you will require a minimum 200ml sample but 1 Litre may be more representative of fuel system conditions and is recommended.

IMPORTANT:

- ***When possible, test the free water phase of the sample taken from the fuel tank. Testing the free water phase will provide more representative results than testing the fuel phase***
- ***ASTM D6469 highlights that ideally all testing should be accomplished at the testing site within a few minutes of the sample being drawn, if not possible samples for microbiological testing should be kept on ice for transportation with testing performed within 4hrs and no later than 24hrs after sampling***
- ***It is critical that fuel sample in a Test Bottle is vigorously shaken for 60 seconds, this ensures good efficiency of extraction for accurate results. Foaming can occur, this is normal and at least 5 minutes settling time should be allowed for a full separation of blue extraction fluid from the fuel***

All microbes (bugs) require the presence of water to grow and proliferate in fuel systems. Consequently, microbes generally live in the bottom water ("free water phase") within a fuel tank and in the fuel / water interface, feeding on the fuel and using nutrients within the water to grow. For the most representative determination of microbial contamination within a fuel system, it is recommended to test the free water phase, when present, from a fuel tank. If you are conducting regular water draining it is strongly advised to test the water sample drained from the tank before disposal.

Within a fuel phase there may be a limited amount of emulsified water available to sustain the growth of microbial communities, especially so for aviation fuels. Fuel only samples (where no free water phase is collected from the tank) are heterogeneous by nature, meaning there are variable levels of emulsified water and microbial presence throughout the sample. This can lead to variable results where multiple fuel only samples are taken from the same fuel tank. As a result, a fuel only sample is less likely to be representative of the actual tank conditions, as in most of these cases there will be either a free water phase, pockets of water, or condensation present somewhere within the tank.



Doing the Test

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0 Scan the QR Code to download the FUELSTAT Result App containing step-by-step video instructions

1



Clean sample equipment using 70% alcohol wipes and let dry. Have the FUELSTAT® *One* test kit contents at hand. Wear correct PPE, including Nitrile gloves and safety eyewear when handling fuel

2



Take a **1 Litre sample** from the lowest point in the tank following OEM and industry guidelines (see sampling advice on page 1)

3



Agitate sample using a swirling motion and leave to **settle for 12-15 mins**. Once settled, is there any free water at the bottom of the sample?

4 **IMPORTANT:**

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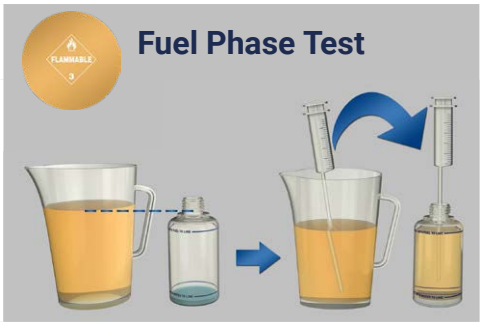
Free Water Phase Test



If there is free water in the sample, use the supplied **20ml syringe and tube** to extract **free water** from the bottom of the sample and place into the plastic cup

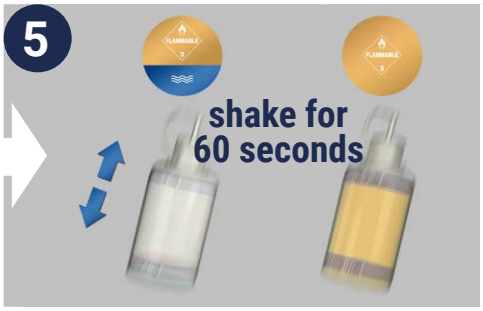
Then use the supplied small **2.0ml syringe** to extract just **2.0ml** of **free water** from the plastic sample cup and place into the FUELSTAT® test bottle

Fuel Phase Test



If there is no free water in the sample, use the supplied **20ml syringe and tube** to extract **fuel** from near the bottom of the sample and place into the FUELSTAT® test bottle. Repeat until filled up to the line marked '**Fuel line**'

5



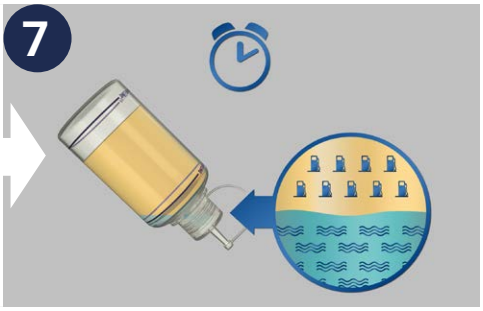
For both types of test, secure dropper cap onto the bottle with the sample and **shake sample vigorously for 60 seconds**

6



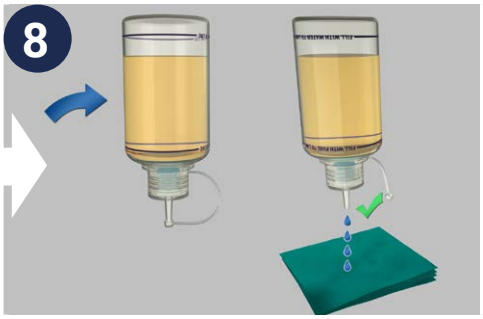
For a fuel sample test leave the FUELSTAT® test bottle contents to **settle for 5 mins**. In the meantime remove the FUELSTAT® *One* test cassette from the sealed foil packet and place on a clean flat surface

7



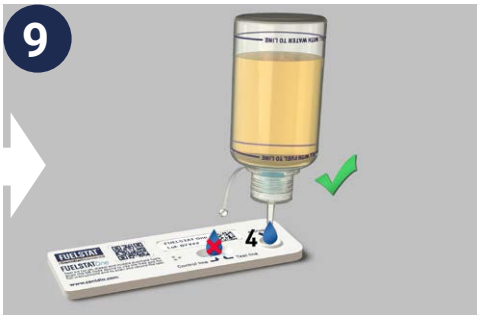
Gently invert test bottle 45° and allow the blue fluid to settle out in the shoulder of the bottle.
NOTE: for a free water phase test the blue fluid will not separate out

8



Fully invert the bottle and allow 4 drops to spill onto a tissue to clear the dropper nozzle of any trapped fuel deposits, **DO NOT TURN THE BOTTLE UPRIGHT**

9



Keep the bottle inverted and carefully allow **4 drops of blue fluid to fall into the circular well** on the test cassette as indicated ensuring that no sample is spilled into the viewing window

10



Leave the FUELSTAT° test cassette on a flat surface for **15-20 minutes**. A dark red line 'Control line' should appear on the left-hand side of the viewing window. This indicates that the test has worked correctly

Reading the Results

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11 If the 'Control line' is visible the test result is now ready to be interpreted. **Read results no later than 30 minutes** after placing sample fluid into sample wells.

FUELSTAT® RESULT APP FOR DIGITAL RESULT VERIFICATION

FUELSTAT® *One* comes with a **FREE** App that verifies the result instantly after the test has been completed. It is available on iOS and Android

The app contains video step-by-step instructions to guide you through all steps 1-11 and verifies the result with a PDF report. Scan the QR code or visit the Google Play or Apple App Store



Take Action

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Negligible Contamination	Moderate Contamination	Heavy Contamination
This means that there is either no contamination or, if there is contamination, it is at such a low level that it requires no action	This means that there is contamination present and action should be taken - refer to OEM manuals and industry guidance	This means that there is higher levels of contamination present and urgent action should be taken - refer to OEM manuals and industry guidance

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Additional Information

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STORAGE, STABILITY AND RECYCLING

Storage conditions:

Store at 10°C to 30°C. Do not use after the stated expiry date. Freezing is not recommended

Suitable packaging:

Must only be kept in original packaging

Transport class:

This product does not require a classification for transport

Recycling:

The user's attention is drawn to the possible existence of regional or national regulations regarding disposal of fuel sample and recycling ability of kit components

MATERIAL DATA

For complete SDS documents please visit: **www.conidia.com**

FUELSTAT® Test Cassettes:

The LFD strip is composed of nitrocellulose membrane, backing card, sample pad, conjugate pad and absorbent pad. The membrane, conjugate pad and sample pad contain dried chemicals and biological material preserved by sodium azide

Extraction Buffer Fluid:

Chemical composition: A mixture of non-harmful salts in water coloured by a harmless food dye. Preserved using ProClin 950 used at 0.06% which is classified as non-harmful at these concentrations. The active ingredient of ProClin 950 is 2-Methyl-4-isothiazolin-3-one (MIT) (CAS-No: 2682-20-4) at 9.5-9.9% solution

Hazardous components: No component is present at sufficient concentration to require a hazardous classification

WARNINGS AND PRECAUTIONS

Caution should be exercised in the handling of fuel or other hazardous materials in accordance with Health and Safety procedures

- Each test cassette is disposable. Use only once
- The test cassette in the foil pack should be kept sealed until ready for use. Once the foil pack is opened the shelf life of the test is not guaranteed. It should be used as soon as possible
- The viewing window of the test cassette should not be touched
- The test cassette should be kept dry at all times. ***DO NOT USE if the cassette and test strip becomes wet***
- If the test cassette appears damaged, scratched or marked in any way please contact Conidia Bioscience

TROUBLESHOOTING

Problem	Cause/Remedy
No drops from bottle	Particulate material in sample may be blocking the dropper nozzle. Shake bottle again, allow to settle and then gently squeeze the bottle until drops appear
No blue dye flow	Add an additional drop, one at a time, until flow is achieved
No dark red control line visible	Too much sample added or fuel flooded cassette and test flooded. Repeat with new test cassette. Flow components exposed to wet or damp. Repeat test using new test cassette
Control and test lines are blue in colour after test	A faint blue control line marker should be visible before use. If blue control and/or test lines are visible after test then extraction liquid not mixed with Fuel/Water sample properly or Fuel/Water added to sample well. Repeat test using a new test cassette
Damaged cassettes or bottles	Contact Conidia Bioscience. Please quote batch number for reference
Lines appear before sample added	Test cassette made wet. Repeat test with new test cassette

NOTE: The test must be read within 30 minutes after placing sample fluid into sample well. Lateral flow devices, as used by FUELSTAT®, are sensitive to light as well as interactions with other liquids. In order to preserve the read-state of a test, the test cassette should be protected from any light and other contaminants in its original foil packaging. As time passes, the higher the risk grows in regard to a strip changing appearance

CONTAMINATION PREVENTION

A single case of fuel contamination, if left unchecked, can easily cost hundreds of thousands of pounds/dollars in damages and remedial activities. Basic fuel maintenance, in comparison, costs relatively little—so it makes good business sense to do these activities. To minimise the risks, there are three key activities you need to do:

- Remove water from tanks
- Manage your fuel supply chain
- Test for fuel contamination regularly...

PRODUCT SUPPORT

Comprehensive support information and video instructions are available on the website: **www.conidia.com**

If you have any additional technical queries regarding your FUELSTAT® test please contact: **info@conidia.com**

Conidia Bioscience Ltd

Unit 6 Surrey Technology Centre,
40 Occam Road, Guildford,
Surrey, GU2 7YG, UK
+44 (0)1491 829102
info@conidia.com

Conidia Bioscience

WWW.CONIDIA.COM

Conidia Bioscience Inc

15 Briarwood Ln, Dover,
NH, 03820, USA
+1 844 438 3578
info@conidia.com