

## The Quantitative Test for Microbes in Ground Fuels, Marine Fuels and Associated Water.



### Important Notice

The test kit should only be used as part of an investigatory process into microbiological contamination in ground and marine fuels and associated water. The test kit must be used strictly in accordance with these instructions or instructions authorized by ECHA Microbiology Ltd. **MicrobMonitor® GMF** results only relate to the portion of sample tested and not necessarily to the system as a whole. Although guidance may be sought by the user on sampling and the interpretation of results, the responsibility for carrying out the sampling and test procedures correctly is that of the end-user and not ECHA Microbiology Ltd. The test kit is designed to detect a recognised group of micro-organisms of significance, but it is in the nature of microbiology that there may be micro-organisms present which are not detected by the test procedure. ECHA Microbiology Ltd does not accept any liability for any decision or assessment taken or made as a consequence of the results obtained.

Test and components should be used once only. Always take appropriate safety precautions when using this test and handling any type of fuel; see safety data sheet for further information.

**MicrobMonitor® GMF** must not be used to test Aviation Fuel; please use the **MicrobMonitor®2** test kit which is specifically configured and approved for testing Aviation Fuel and other fuel types in compliance with ASTM D7978, IP613 and is recommended by IATA and JIG.

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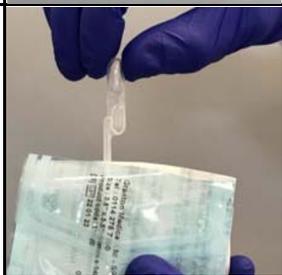
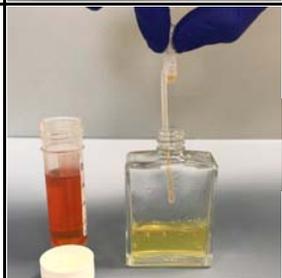
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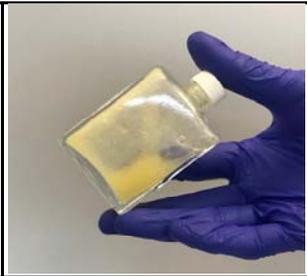
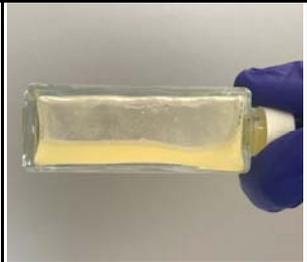
[www.echamicrobiology.com](http://www.echamicrobiology.com)

## APPLICATION

**MicrobMonitor GMF** is specifically configured for detecting microbial contamination in diesel fuels including biodiesel and blends, gas oils and heating oils used in the marine, ground transportation and power generation Industries. The **MicrobMonitor GMF** test should not be used for aviation fuels or any other application. If in doubt about the suitability of **MicrobMonitor GMF** for your application please contact your supplier.

## INSTRUCTIONS FOR USE:

<p>1. Take a fuel sample from your fuel system and put this in the sterile sample container provided. Close the sample container. Remove the blue seal on the <b>MicrobMonitor GMF</b> test bottle and loosen the bottle cap. Label the <b>MicrobMonitor GMF</b> test bottle with the sample details using the label provided.</p>	
<p>2. Open the pipette pouch at the side of the bulb end and remove the pipette. Only handle the pipette bulb.</p>	
<p>3. Shake the sample container briefly. Place the tube of the pipette into the fuel sample and squeeze the bulb. Release the bulb of the pipette. This should fill the tube with fuel. Repeat this process if necessary, until the tube of the pipette is filled. Avoid over filling the pipette as it will lead to incorrect volumes being dispensed.</p>	
<p>4. Open the <b>MicrobMonitor GMF</b> test-bottle and squirt the measured fuel sample into the bottle by pressing the bulb of the pipette fully, once. The pipette delivers 0.25ml from the tube.</p> <p>Re-cap the <b>MicrobMonitor GMF</b> test-bottle.</p>	
<p>5. Tap the <b>MicrobMonitor GMF</b> test bottle firmly, several times against your hand or on the empty test kit-packaging box, to break up the gel.</p>	
<p>6. Shake the bottle vigorously for 30 seconds. Make sure the fuel sample is completely mixed with the gel.</p>	

<p>7. Stop shaking the test abruptly so that the gel collects in the bottom of the bottle. Tap the bottle in the palm of your hand until the gel forms a flat layer on one of the larger flat sides. Ensure that a uniform layer reaching all corners of the test bottle is obtained</p>	
<p>8. Lay the bottle flat, with the gel layer down, and place in a warm, dark location for up to 4 days; the optimum temperature range is 22 - 28°C (72 - 82°F). If microbes are present in the fuel, purple or dark red spots (colonies of microbial growth) will appear in the gel progressively. If the temperature is slightly lower, the results may take longer than 4 days to develop.</p>	
<p>9. Examine the test regularly during the 4 days. Compare the bottle to the chart and read the final result after four days. The number of spots (microbial colonies) present can be counted or estimated by comparison with the Test Results Chart provided on page 4. Very heavily contaminated fuel will often give a provisional result after 1 day. Lightly contaminated fuel may take longer to give a result. Avoid shaking the test bottle and keep the test out of strong light during examinations.</p>	

#### Attention

- If testing sludge which is dark or pigmented, be careful when observing results not to confuse particles of sludge with colonies of microbial growth.
- It is the number of spots not their size which is important. Once a spot is counted do not count it again if it grows larger.
- Some fuels may contain antioxidants which can produce a uniform pink or orange colour in the gel (usually within one day). This does not interfere with the growth of the microbes and the microbial colonies (which are dark red or purple) should be counted ignoring the pink or orange colour.

## DISPOSAL OF USED TEST BOTTLES

Used test bottles with visible microbial growth are deactivated best with disinfectant. Add some strong disinfectant to the bottle and leave the closed bottle overnight. Tests should then be disposed of in accordance with local waste disposal regulations.

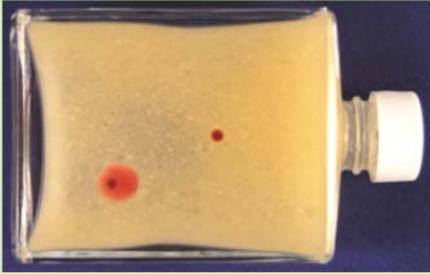
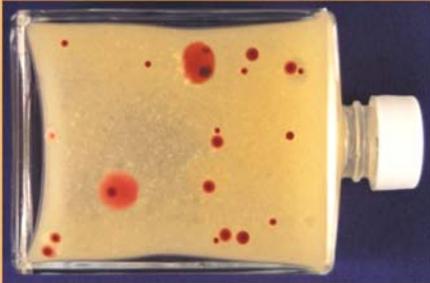
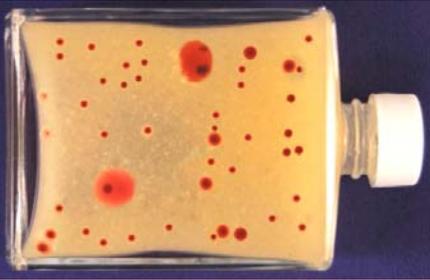
## STORAGE & SHELF LIFE

Store tests in a cool (less than 22°C), dark location. Avoid prolonged freezing, or storage at high temperatures. The expiry date is shown on the box label.

## ADVICE & TECHNICAL SERVICE

If you have ascertained a significant microbiological contamination in your fuel system, we advise you to contact your supplier of **MicrobMonitor GMF** for further advice.

TEST RESULTS CHART

RESULT	INTERPRETATION	COMMENT
	<p>No more than 2 spots</p> <p><b>LOW CONTAMINATION</b></p>	<p>The level of contamination is not above that commonly found in clean diesel.</p>
	<p>3 to 25 spots</p> <p><b>MODERATE CONTAMINATION</b></p>	<p>Microbes are present above the numbers usually found in clean diesel.</p>
	<p>More than 25 spots</p> <p><b>HEAVY CONTAMINATION</b></p>	<p>Microbes are present in high numbers and you may experience fuel filter clogging or fuel injector problems.</p>

ALSO AVAILABLE

Optional Products for use with MicrobMonitor GMF

- **Incubator Cultura** (ECHA14/IN230V or ECHA14/INV110V) - small portable incubator which enables optimal, consistent incubation temperature of **MicrobMonitor GMF** tests; holds about 15 **MicrobMonitor GMF** test bottles; mains operated (110 or 230 Volt).
- **MicrobMonitor Bumpers** (ECHA16/TB/001)- soft, rubber-like, hemispheres which stick on to a bench top and enable easy breaking and shaking of **MicrobMonitor GMF** gel.
- **Sterile swabs** (ECHA15/SW/03) - swabs for sampling surface contamination (e.g. tank surfaces, filter cartridges etc.).

Other Test Kits & Ancillary Items

Other test kits and ancillary items are available from ECHA Microbiology Ltd. For our full range of test kits and ancillaries see [www.echamicrobiology.com](http://www.echamicrobiology.com).