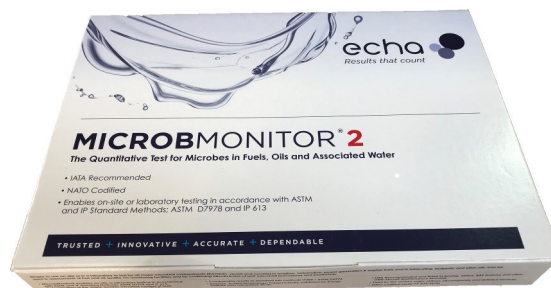


MICROBMONITOR[®]2 MICROBIOLOGICAL CONTAMINATION TEST KIT

- ◆ **IATA APPROVED.**
- ◆ **JIG RECOMMENDED.**
- ◆ **ACCURATE AND RELIABLE.**
- ◆ **QUANTITATIVE RESULT.**
- ◆ **EASY TO PERFORM ON SITE TEST.**
- ◆ **NO LABORATORY REQUIRED.**



Introduction.

Microbial growth can occur wherever any water accumulates in fuel tanks and systems. Only very small quantities of water are required and films of water less than 1mm thick are sufficient to support microbial growth. When heavy microbial growth occurs, fuel quality is affected and the fuel may become off specification. Microbial growth can also disarm Filter Water Separators and can cause corrosion of fuel tanks, pipelines and fuel system components. If microbiologically contaminated fuel is uplifted onto aircraft then there is a possibility for serious operational problems, including fuel tank corrosion, clogging of engine fuel filters and malfunction of fuel quantity indicator systems.

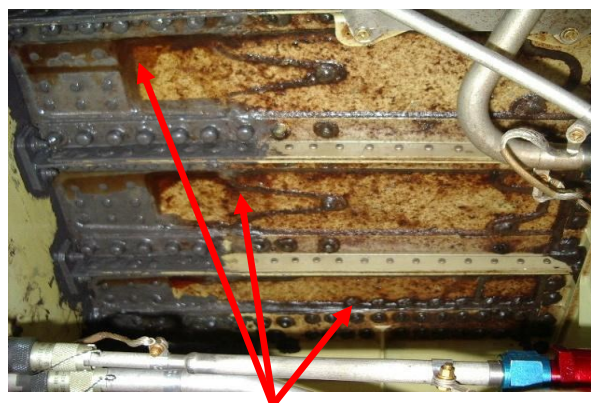
Prevention of microbial growth is therefore a key safety requirement in the aviation fuel supply chain. It is best accomplished by rigorous attention to preventing water from entering fuel systems, by designing and operating systems so that they do not accumulate water and by routine removal of water from tank bottoms and pipeline system low points. It is also important to regularly maintain filters and to change filter elements at the first signs of microbial growth. Further information on ensuring the quality of aviation fuel at airports is provided in ATA 103 and the Joint Inspection Group (JIG) Guidelines. Information is also contained in JIG Bulletin 83 *Microbial Monitoring Strategies Oct 2015* and associated Technical Information Document *Part 1 Microbial Monitoring Strategies Oct 2015*. JIG Guidelines are endorsed by IATA, and additional guidance relevant to aviation fuel

supply from the refinery up to delivery to the airport is available in EI/JIG Standard 1530 and in API Recommended Practice 1595. Further information for aircraft operators can be found in the IATA *Guidance Material on Microbiological Contamination in Aircraft Fuel Tanks*.

However, even when all reasonable measures are taken to keep water out of fuel systems, there can still be a risk of microbial growth. This is why IATA, EI, JIG and API recommend routine microbiological monitoring to ensure systems remain free of contamination.

The MicrobMonitor2 Test Kit.

ECHA Microbiology developed the MicrobMonitor2 specifically for testing jet fuel in response to calls from operators and maintenance/repair companies for a reliable quantitative test for total microbial contamination in fuel tanks and systems. It is recommended by IATA and JIG and Aljac now stocks and distributes the MicrobMonitor2 Test Kit.



Microbial growth in an aircraft fuel tank

About The MicrobMonitor2 Test Kit.

MicrobMonitor2 provides operators with an easy to use test kit for quantitative site screening of fuel samples for microbiological growth. It offers a simple to read, accurate assessment of *H.res*, bacteria and other fungi in the sample.

A small sample of fuel is measured into a glass bottle which contains a specially formulated nutrient gel. The number of microbial colony forming units (CFUs) that develop over the test period can be established and this indicates the severity of the contamination.

MicrobMonitor2 Test Kit Features.

- ⇒ Developed specifically to test aviation fuels for microbiological contamination, not derived from alternative technologies.
- ⇒ Works with any petroleum product and associated water.
- ⇒ Quick and easy to use on-site or in the laboratory and is more economic than standard laboratory tests.
- ⇒ Detects low level contamination for an early warning of potential problems.
- ⇒ Indicates the severity of any infection not just the presence of microbes (unlike “go, no-go” tests).
- ⇒ Can be used to monitor trends of contamination.
- ⇒ Determines when IATA contamination limits for aircraft fuel are exceeded and remedial measures are needed.
- ⇒ Contamination limits and detection levels can be user defined for specific facilities and operations (unlike “go, no-go” tests).
- ⇒ Unaffected by biocides, DiEGME or other fuel additives and quickly assesses the effectiveness of biocide treatments.
- ⇒ Detects yeasts, bacteria and both spores and active growth of moulds (including *Hormoconis resiniae*), unlike tests which look for specific by products and so may have a limited detection capability.

Accuracy and Reliability Are Important.

MicrobMonitor2 was originally developed for use in the aviation industry for testing jet fuel and is recommended by IATA and the aviation fuel Joint Inspection Group (JIG).

MicrobMonitor2 has been independently validated in an inter-laboratory study conducted for the Energy Institute and enables testing in accordance with IP standard method IP613 and ASTM D7978. The test gives results which are comparable with laboratory standard test methods IP 385 and ASTM 6974-03.

Since its introduction, MicrobMonitor2 has become established as a globally recognised standard for onsite monitoring of microbes in a broad range of fuels and oils.

- ⇒ It is listed by Boeing, Airbus, BAE Systems and other OEMs in their Aircraft Maintenance Manuals.
- ⇒ It is listed by the Joint Inspection Group (JIG) in its Operational Bulletin October 2015 “Technical Information Document; Part 1 Microbial Monitoring Strategies”.
- ⇒ It is used regularly by major users and suppliers of fuels such as Lufthansa, KLM, BP and ExxonMobil.
- ⇒ It is NATO codified and used by air forces, navies and ground forces of many countries.
- ⇒ It is used in marine, offshore, power, transportation and other industrial sectors.

What about Support?

ECHA provides full technical support to all of its customers, and will never leave you with an unresolved issue. Whether it is support with interpretation of results or advice on testing regimes, ECHA will always be on hand with the technical knowledge and operational know how that you need.

Kit Contents.

- 1 off fibre board box, colour gloss printed with quick guide (EP113) printed on box surface.
- 1 off recyclable plastic insert tray which holds the MicrobMonitor2 test bottles in place and has a receptacle chamber for storing measuring devices and tube labels.
- 1 off MicrobMonitor2 instruction leaflet (EP066).
- 5 off MicrobMonitor2 test bottles.
- 5 off 0.1 to 1ml sterile measuring syringes (NO Needle).
- 5 off 0.01ml (10µl) sterile measuring loops.
- 5 off bottle tube labels.



Test Procedure.

1. Shake sample and then allow to stand. If free water is present determine whether to test fuel/oil or water. Determine the recommended test volume (aviation fuel 0.5ml; other fuels 0.25ml; oil 0.01ml; water associated with fuel/oil 0.1 or 0.01ml; see Instruction Leaflet and appropriate technical guidance leaflets for further details).

2. Break and discard the plastic seal on the **MicrobMonitor2** bottle. Remove the cap and place on a clean surface. Don't touch the inside of the cap or bottle neck. Using the supplied loop (0.01ml) or syringe (for other volumes), transfer the required volume of sample to the **MicrobMonitor2** bottle and replace the cap.



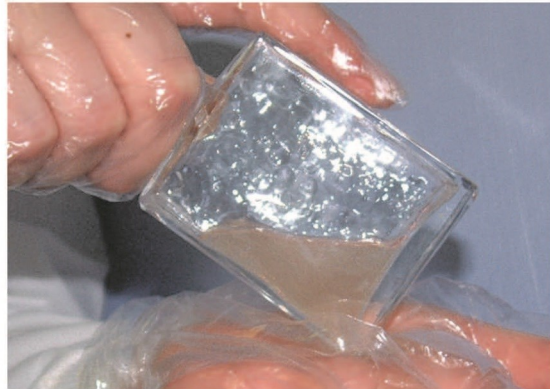
3. Tap the bottle to break up the gel.



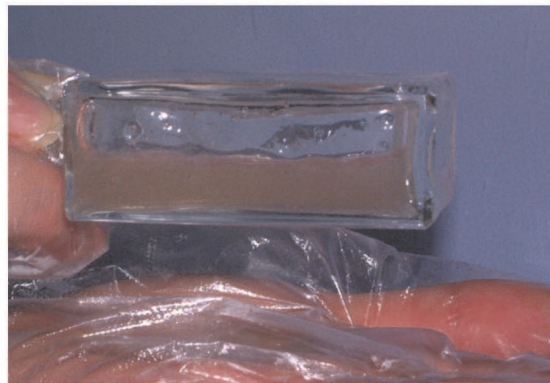
4. Shake vigorously for 30 seconds. Ensure gel is not lumpy and sample is fully dispersed.



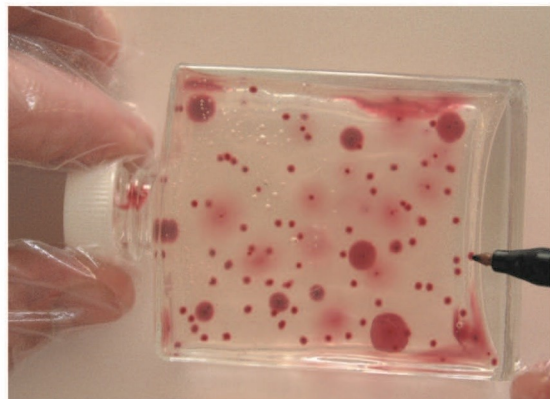
5. Flick the gel into the bottom of the bottle.



6. Tap the bottle to make a flat layer of gel. Lay the bottle flat (with gel layer at the bottom) in a warm dark place and incubate at 25°C (\pm 3°C) for 4 days. Examine at least once in the first 3 days and again after 4 days. Try not to disturb the gel during examination.



7. To examine the test, hold bottle against a light background and count all of the red / purple colonies, marking them off on the bottle with a felt tip pen. Re-incubate and examine as necessary for up to 4 days. If there are too many colonies to count an estimate of their number can be made by comparison to the chart provided.






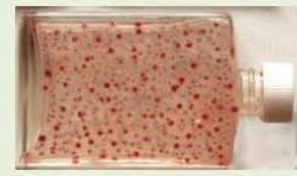


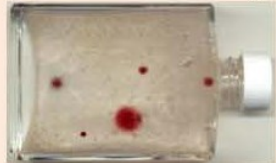
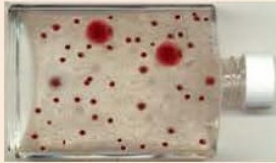
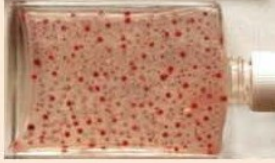

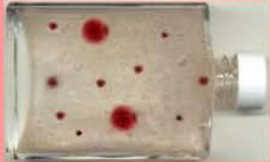

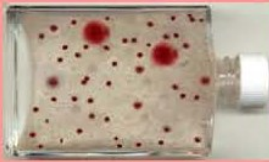




NB.

Alternative incubation temperatures may be appropriate. If the temperature falls below the required range during incubation, colonies will take longer to develop; extend incubation by a time equivalent to the time the temperature was below the required range.

If it is difficult to distinguish colonies (e.g. streaky patches or unusual colour) see Instruction Leaflet and Technical Guidance document EP157 for further details.

Test Results.

Interpretation	SAMPLE TYPE		
	Category A. Bulk fuel sample from supply & distribution / airport fuel depot or ANY sample from in-to-plane operation ⁽¹⁾ (0.5 ml tested)	Category B. Drain, bottom or low point sample from storage tank, filter or pipeline in supply & distribution or airport fuel depot	
		Fuel phase (0.5 ml tested)	Water phase (0.01 ml tested)
Acceptable	<4,000 cfu/litre <i>(<2 colonies counted)</i>  to 	<10,000 cfu/litre <i>(<5 colonies counted)</i>  to 	<100,000 cfu/ml <i>(<1000 colonies estimated)</i>  to 
	4,000 – 20,000 cfu/litre <i>(2 - 10 colonies counted)</i>  to 	10,000 – 100,000 cfu/litre <i>(5 - 50 colonies counted)</i>  to 	100,000 - 1,000,000 cfu/ml <i>(1000 – 10,000 colonies estimated)</i>  to 
Heavy (Action)	>20,000 cfu/litre <i>(>10 colonies counted or estimated)</i>  to 	>100,000 cfu/litre <i>(>50 colonies counted or estimated)</i>  to 	>1,000,000 cfu/ml <i>(>10,000 colonies estimated)</i> 

How To Order.

Part Number: 0901000020.

Pack Quantity: 5 tests.

Specification.

Test Type: Gel Culture Test in accordance with IP613 and ASTM D7978.

Storage Conditions: Store at temperatures between 2 and 22°C in the dark.

Shipping specification: Pack dimensions 350x250x50 mm. Weight: 950g.

UK NATO Stock Number: 6640-99-834-3573.