

How can I check my fuel storage tank?

- Samples from low points provide the best and most consistent early indication of developing microbial growth.
 - Sample tank (fixed and vehicle) bottoms / sump drains, Filter drains, Hydrant low points.
- Water phase at the bottom of a tank will contain higher levels of contamination than fuel phase.
- Contamination in fuel phase will be more prone to variation.
 - Depends on the degree of disturbance in the tank.
 - Settling time applied prior to sampling.
- **CONSISTENCY is key**



How do I take samples?

- Hygiene around the sampling activity is important.
- ASTM D7464 *Standard Practice for Manual Sampling of Liquid Fuels, Associated Materials and Fuel System Components for Microbiological Testing*.
- JIG Bulletin 83 and Technical Information Document *Microbial Monitoring Strategies*, Oct 2015 provides further details on sampling locations and frequency.



Operations Bulletin



Bulletin 83 Microbial Monitoring Strategies October 2015

Introduction

This publication, available to download from the JIG website (and soon to be available as a hard copy) is a new format JIG Information Document: *Microbial Monitoring Strategies*. Endorsed by IATA, it complements their publication: *Guidance Material on Microbiological Contamination in Aircraft Fuel Tanks*.

Although IATA recommends maximum allowable levels of microbial contamination in aircraft fuel tanks, there are no industry specified microbiological contamination limits for the manufacture or distribution of aviation fuels up to point of delivery to aircraft due to the wide variety of facilities involved and the extremely dynamic nature of the distribution system. Guidance provided in this JIG Information Document is intended to ensure microbe levels at the point of delivery to aircraft are significantly lower than the IATA recommended maximum levels for aircraft fuel tanks.

The following content areas are included in this three part document.

Part 1: Microbial Monitoring Strategies

- Introduction and background on the subject of microbial contamination
- Guidance on appropriate sampling and monitoring strategies for use throughout the aviation fuel supply chain up to the point of delivery to aircraft

Part 2: Microbial Growth Risk Management and Testing

- Guidance to operations staff wanting to employ risk based microbial testing as part of their management and control strategy for both fuel product quality assurance and facility maintenance
- Guidance, where microbial contamination has been confirmed by testing, on more detailed monitoring that can help identify potential upstream or local sources and provide remediation strategies
- Guidance on test kits and limit values that can be used for a monitoring program

Part 3: Informative annex on Microbial Growth and Monitoring Strategies

- Information on microbial proliferation and impact on systems - fouling & corrosion
- Specific issues related to microbial contamination of fuel, some limited suggestions on remediation, and advice on further reading

Note: The JIG Standards only mandate the use of semi-annual microbial monitoring for vehicles routinely used for the defueling of aviation fuel. However, microbial monitoring may also be used as an alternative to quarterly visual inspections to assess the microbiological cleanliness of product recovery tanks and as a means to evaluate possible extension to the main storage tank cleaning frequency.

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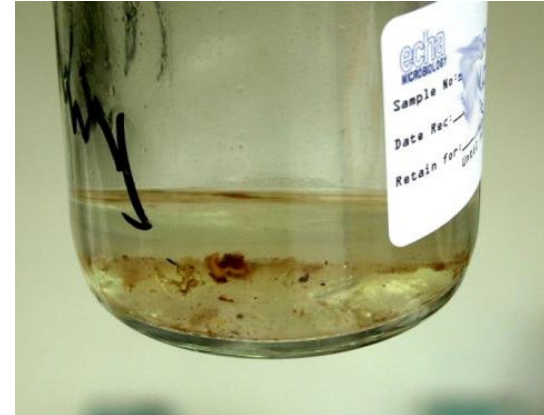
Routine Monitoring Frequency

Item	Sampling location	Sampling Frequency		
		High risk facilities	Moderate risk facilities	Low Risk facilities
Fixed Storage Tanks	Storage Tank sump drain line or dead bottom sample	Monthly	3 - 6 monthly advisable.	Annual monitoring after initial (at least) quarterly screening for 12 months to determine background contamination level
Product Recovery Tanks	Storage Tank sump drain line or dead bottom sample	Monthly	3 monthly.	Quarterly where visual inspection is not possible
Defuelling Vehicle	Vehicle Tank sump drain line	Monthly	3 monthly	6 monthly for vehicles routinely used for defuelling

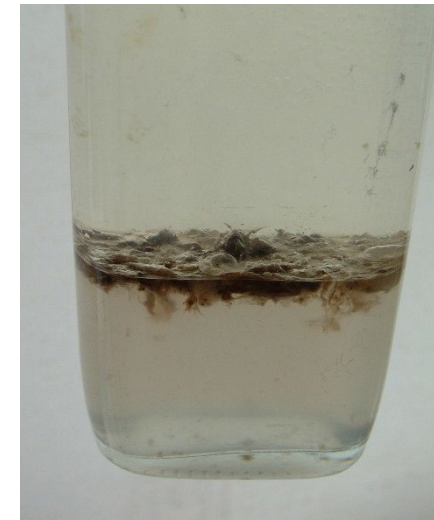
JIG Microbial Monitoring Strategies (Bulletin 83) Technical Information Document, 2015

Visual examination of samples

- Always take note of unusual observations at time of sampling.
- Visual assessment remains a primary check!
- Visible evidence of contamination is usually found in samples from the fuel water interface.
- Significant contamination is not always visually evident in fuel samples!



Jet fuel sample with translucent, lacy material (bacterial polysaccharide) at water interface.



Jet fuel sample with brown floccose fungal growth at water interface.

Sampling - Take home points

ANY TEST IS ONLY AS GOOD AS THE SAMPLE !!

- Correct and consistent procedure is critical.
- Samples from low points (e.g. tank bottoms / sumps) provide the best and most consistent early indication of developing microbial growth.
- Hygiene around the sampling activity is vital.
- Test samples as soon as possible after sampling.

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