

# Operations Bulletin



Bulletin No 123    **Operation of Closed-Circuit Samplers and Testing Terminology**    June 2019

## Background

'Visijars' (also known as closed-circuit samplers) are clear glass containers with a lid, which are permanently connected to a sample point to facilitate the Visual Appearance Check and other field quality control testing. Their use has become increasingly popular for drawing samples, particularly during aircraft fuelling operations.

Closed-circuit sampling systems are often preferred to open sampling into containers as the potential for fuel to be spilled or come into contact with operators is minimised, thus reducing the HSE risks associated with sampling activities (especially on the apron). However, if not used or maintained properly, closed-circuit sampling systems can lead to an increase in other risks related to fuel quality such as:

- failure to identify contaminants and non-conforming fuel
- inadvertent addition of contaminants to what would otherwise have been a clean fuel sample

This Bulletin introduces changes to the JIG standards and recommends actions for users of 'Visijars'. The Bulletin shall be read in conjunction with the associated Technical Information Document (TID) No3, which highlights the common types of improper use / operation of closed-circuit sampling systems and provides further guidance on the best practices that should be followed.

The TID No3, entitled "*Design, Use, and Maintenance of 'Visijars' (closed-circuit samplers) for sampling and testing*" is attached to this Bulletin and will also be available from JIG's website (Extranet/Publications).

## Update to Testing Terminology

The JIG standards currently use the following terms & definitions;

*Appearance Check* – Appearance of fuel by visual assessment

*Visual Check* – Appearance Check + Chemical Water Detector test (CWD)

It is recognised that this terminology is not consistent with the major fuel specifications where both terms, 'Visual' and 'Appearance', are used to describe an assessment to verify that the fuel is "Clear and Bright, free of undissolved water, sediment, and suspended matter".

In addition to this, the separation of the terms 'visual' and 'appearance' in the current JIG standards is seen by many as being ambiguous, causing confusion as to which quality control checks are required, therefore often resulting in a CWD test being done when it is not required.

To address this issue, the term 'Visual Check' will be removed, and 'Appearance Check' will be updated to 'Visual Appearance Check'.

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Current JIG wording	Updated JIG wording	Description of requirement
Appearance Check	Visual Appearance Check	Appearance of fuel by visual assessment
Visual Check	Term removed  (Tests will be referred to independently, e.g. Visual Appearance Check plus CWD)	Appearance of fuel by visual assessment + CWD

There is currently no action required as these changes will not take effect until the next issue of the JIG operating standards. However, they are aligned with the terminology used in EI 1530 2<sup>nd</sup> edition which was released in May 2019.

Note: it is now acceptable in the JIG standards to use an EI 1598 qualified inline water sensor to monitor free water content in place of performing CWD testing (in accordance with Bulletin 110).

## Use of 'Visijars'

The JIG standards refer to 'Visijars' as a 'field sampling container' used for product examination in connection with Visual Appearance Check procedures. They are **not** intended for flushing of bulk contaminants (e.g. tank low point flushing), but it may necessary for some sampling pipework to be flushed / displaced into the 'Visijar' before sampling.

They should not be used for flushing activities for the following reasons:

- There is usually insufficient flow velocity and volume to effectively mobilise and flush contaminants
- Contamination of the closed-circuit sampling system lines which can be difficult to remove

Samples should only be drawn into 'Visijars' for product examination after flushing activities have been performed.

Where their use for flushing is unavoidable, procedures shall demonstrate that the potential issues associated with this practice have been addressed to enable representative samples to be drawn. Further information on which can be found in the Technical Information Document No3 - *Design, Use, and Maintenance of 'Visijars' (closed-circuit samplers) for sampling and testing*) (e.g. additional flushing before a sample is drawn for testing). Flushing via a 'Visijar' from a location where contaminants are expected to accumulate for removal (e.g. a tank low

point drain) is not recommended. However, this practice may be deemed sufficient where there isn't expected to be a significant level of contaminants (e.g. into plane sampling).

### Maintenance of 'Visijars'

Fuels, particularly Jet fuel, inherently attract dirt, so any fuel-wetted surface is likely to accumulate dirt very quickly. Consequently, 'Visijars' collect a layer of contaminants, particularly those located on vehicles as they collect dirt during driving operations.

It is essential that they are kept in a clean condition by regular cleaning and appropriate maintenance. Section 7 of the TID contains additional guidance on maintenance best practices.

### Update to Field Sampling Container

To clarify the existing requirements for field sampling containers, the 'field sampling containers' section of the JIG standards is hereby updated as outlined below:

"Clear, clean glass jars of at least 1 litre capacity with wide necks and screw caps or closed sampling clear glass containers or 'Visijars' shall be used for product examination in connection with Visual Appearance Check procedures but **should not be used for flushing activities before sampling**. **Sampling containers shall be kept clean at all times by routine cleaning and appropriate maintenance.**"

### Correct operation

Closed-circuit sampling systems shall be designed such that a vortex is created as this is an essential requirement for the Visual Appearance Check to be effective. The vortex assists any solid contaminants or free water that may be present, to gather at the centre of the base of the container, making it easier to observe them. Anything that disrupts the formation of this vortex or obscures the operator's view of the sample has the potential to reduce the effectiveness of the test, which is a critical quality control check.

Therefore, any such accessories shall not be installed in a 'Visijar' during sampling or Visual Appearance Checks. Examples of items that can disrupt vortex creation and / or impact the effectiveness of test include:

- Gauze / mesh screens to catch chemical water detector (CWD) capsules.

These screens are often locally made to collect CWD capsules that may accidentally drop into the sample. Where a device to catch CWD capsules is required then a 'capsule catcher' of the type shown below in Picture 1 may be installed.

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**Picture 1**

A 'capsule catcher' device of this type may be used



- Thermometer and Hydrometer inserts

Although these inserts may be supplied by the manufacturer to assist with density measurement, they have a significant effect on the vortex formation and obscure the view of the sample during the Visual Appearance Check. Therefore, these inserts shall be removed when performing sampling and Visual Appearance Checks. Where fuel density and / or conductivity testing is required, they may be re-inserted only after the Visual Appearance Check has been completed.

- Bottom / drain ball valve kept open during the sampling and Visual Appearance Check.

The bottom valve shall be kept closed throughout sampling and testing as the vortex is likely to drive any contaminants present down into the 'Visijar' outlet pipework, therefore invalidating the Visual Appearance Check.

An informative video has been produced to illustrate the effect of these accessories on vortex creation. This video can be viewed on the following link: <https://youtu.be/LXOriOLQkcA>

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## Update to Visual Appearance Check

To highlight the importance of good vortex creation and an unobscured view of the sample when performing a Visual Appearance Check, this section of the JIG standards is hereby updated to include the following text:

**"A vortex shall be created in the sample and the fuel assessed according to the criteria below. Where 'Visijars' are used, they shall not contain any accessories that could disrupt the vortex formation or obscure the operator's view of the fuel sample drawn for testing. The bottom ball valve shall be in the closed position."**

## Spring loaded valves

It is the intent of JIG that at the next revision of the standards (JIG 1 & 2 – Issue 13, and JIG 4 – Issue 5), the requirement that all drain and sample lines should have self-closing valves (e.g. spring-loaded), will become mandatory (e.g. the should will change to a shall).

## Actions to Implement this Bulletin (See Table 1 for Action Type Codes)

Action Description	Action Type	Target Completion Date
1. Review the setup and operation of all closed-circuit sampling systems to confirm that current flushing and sampling procedures are in accordance with the principles of this bulletin (e.g. flushing activities should not be performed via a 'Visijar').	RP	31 <sup>st</sup> December 2019
2. 'Visijars' shall always be kept in a clean condition by routine cleaning and appropriate maintenance. <b>Note:</b> For additional guidance on maintenance best practices see section 7 of the Technical Information Document " <i>Design, Use, and Maintenance of 'Visijars' (closed circuit samplers) for sampling and testing</i> ".	JS	31 <sup>st</sup> December 2019
3. Operations to review their Visual Appearance Check procedures to confirm there is a requirement that a vortex shall be created in the sample. Procedures to be updated and training given as required.	JS	31 <sup>st</sup> December 2019
4. 'Visijars' shall be operated in accordance with this Bulletin and shall be kept free of accessories that can disrupt vortex formation, such as gauze/mesh screens or integrated hydrometer/thermometer wells during sampling and Visual Appearance Checks.	JS	31 <sup>st</sup> December 2019

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**Table 1 Action Type Codes**

Action Types	JIG Bulletin Action Type Definition
JS	Change to JIG Standard – to be adopted by JV and/or Operator to continue to meet the JIG Standard(s) (JIG 1, 2, 4, El/JIG 1530 and the JIG HSSE Management System).
RA	Required Action to implement one off verification or checks outlined in the table of actions.
RP	JIG Recommended Practice which the JV should consider adopting as its own practice (**).
I	Issued for information purposes only.

Note (\*\*) - If the JV agreements require any of the JIG Standards and/or any of the JIG Common Processes as the governing operational standard then adoption of changes to applicable JIG Standards and/or Common Processes should not be considered optional by the JV Board.

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