

Methanol Vial Shelf Life: A 52 Week Study

**TECHNICAL
BULLETIN**

Introduction

Methanol vials have been adopted nationally for use in the preservation of soil samples for volatile organic compounds (VOCs), through both provincial and federal guidelines and regulations.

The benefits of methanol vials over customary glass jars for sample collection include longer hold times, improved stability of target VOC parameters and improved extraction efficiency. However, methanol is an excellent sink for VOCs: background contamination presents a major challenge for long-term storage of methanol vials.

How long can I store methanol vials?

It is difficult to give a blanket response, because much of it depends on storage conditions. To best answer this question, Maxxam undertook a 52-week study to determine when and under what conditions background contamination from VOCs could be detected in stored methanol vials.

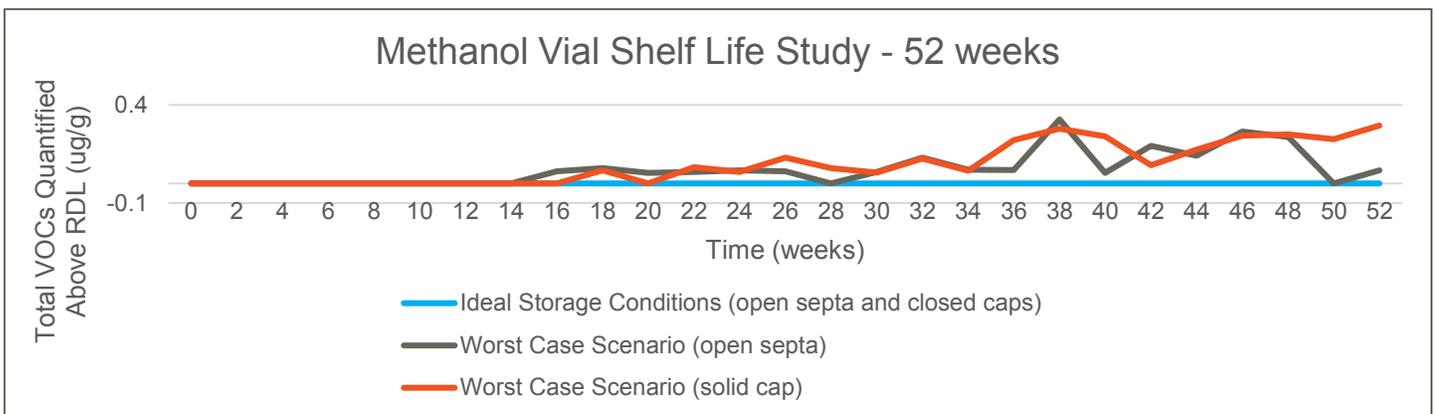
Study Design and Observations

The study was performed at Maxxam’s Mississauga laboratory. Methanol vials with septa and solid caps were stored under “ideal” and “worst case” conditions. One

methanol vial per cap type and storage condition was submitted for analysis at 2 week intervals, including time 0, up to 52 weeks. Samples were analysed for our standard list of regulated VOCs.

For this study, “ideal” conditions were defined as space dedicated for the storage of methanol vials, with a cool, dry atmosphere and free from potential sources of VOC contamination. “Worst-case” conditions were defined as space where methanol vials would be stored in close proximity to materials or supplies that are potential sources of VOC contamination and where there is considerable traffic. We used our dedicated methanol cabinet as the “ideal” storage conditions and our walk-in fridge used for short-term sample storage as the “worst case” conditions.

To account for VOC contamination from multiple or different compounds, we assessed total concentrations of VOCs detected at or above the reporting limit in each vial. The results from the 52-week study are presented in the following graph. The graph shows the total VOC concentrations measured at each two-week interval by storage condition and cap type. Because detection limits vary among VOCs, we assigned all non-detect parameters a value of “0”.



Background contamination was first seen shortly after the 3-month mark in vials stored under the “worst case” conditions. There was no appreciable difference in contamination between vials sealed with septa or solid caps. By the end of the study, three target parameters (hexane, dichloromethane (DCM) and toluene) were quantified above the detection limits in vials stored under “worst case” conditions. There was no measureable background contamination in vials stored under “ideal” conditions for the duration of the study.

Conclusions and Recommendations

Our study shows that methanol vials stored in a cool, dry environment away from VOC sources can potentially be stored for up to 1 year without contamination or loss of methanol due to evaporation. Under “worst case” storage conditions, background levels of target VOC compounds were detected shortly after the third month of this study.

For long term storage of methanol vials, Maxxam recommends the following:

- Store methanol vials in a cool, dry environment, away from VOC sources.
- **Methanol vials should not be stored for longer than 3 months.** If the storage environment is potentially compromised, storage time should be less than 3 months.
- **If methanol vials have been stored longer than 3 months,** methanol blanks should be submitted to Maxxam for analysis to **confirm the absence of background contamination.**

The number of methanol blanks submitted for quality control purposes should be statistically representative of the number of vials in storage. **Maxxam recommends submitting at least 10% of the stored methanol blanks for analysis.**

- **Check the methanol level in the vials prior to use.** Methanol should be at the 10 mL line.

Note that the “worst case” storage conditions used in this study do not cover all scenarios. We highly recommend a case-by-case approach to determine if the recommended 3-month storage time applies.

About Us

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For more information, please contact:

enviro@maxxam.ca

Or 1.800.563.6266