



STANDARD OPERATING PROCEDURES

SOP: 1706
PAGE: 1 of 10
REV: 0.0
DATE: 09/12/94

SUMMA CANISTER FIELD STANDARDS

CONTENTS

- 1.0 SCOPE AND APPLICATION
- 2.0 METHOD SUMMARY
- 3.0 SAMPLE PRESERVATION, CONTAINERS, HANDLING, AND STORAGE
- 4.0 INTERFERENCES AND POTENTIAL PROBLEMS
- 5.0 EQUIPMENT/APPARATUS
- 6.0 REAGENTS
- 7.0 PROCEDURES
- 8.0 CALCULATIONS
- 9.0 QUALITY ASSURANCE/QUALITY CONTROL
- 10.0 DATA VALIDATION
- 11.0 HEALTH AND SAFETY
- 12.0 REFERENCES
- 13.0 APPENDIX
 - A - Figures

SUPERCEDES: SOP #1706; Revision 2; 07/30/90; U.S. EPA Contract EP-W-09-031.



STANDARD OPERATING PROCEDURES

SOP: 1706
PAGE: 2 of 10
REV: 0.0
DATE: 09/12/94

SUMMA CANISTER FIELD STANDARDS

1.0 SCOPE OF APPLICATION

The objective of this procedure is to establish standard operating practices for the use of Summa canisters. Summa polished canisters are used to store calibration gas standards for transport to field sampling sites. These standards contained in the Summa canisters will be used for calibration of field instrumentation. In addition, a series of different concentrations of gas standards, or dilutions in the field of a single canister, can be used to construct calibration curves and to ascertain minimum detection limits on various field instrumentation currently used by Scientific, Engineering, Response and Analytical Services (SERAS) and Environmental Protection Agency/Environmental Response Team (EPA/ERT).

Mention of trade names or commercial products does not constitute U.S. EPA endorsement or recommendation for use.

2.0 METHOD SUMMARY

A clean evacuated Summa canister is obtained. A certified gas standard cylinder is selected and a delivery pressure of 20-30 psi is set. The lines are bled with the gas standard. Then, the Summa canister is opened while still attached to the gas standard line, and is charged to 20-30 psi with the certified gas standard cylinder. The Summa canister is closed and the gas standard lines are removed. A "tee" with a septum is attached onto the Swagelok fitting of the Summa canister. The "tee" is purged with the contents of the Summa canister. The Summa canister valve is opened and samples can be taken via a gas tight syringe through the septum on the "tee." The valve is closed when not in use. Tedlar bags can also be filled from the "tee."

3.0 SAMPLE PRESERVATION, CONTAINERS, HANDLING, AND STORAGE

Samples and gas standards can be kept several months in the Summa polished canisters. Care must be taken to ensure no leaks occur when the "tee" and septum are used. In addition, the needle valve on the Summa canister must be completely closed when not in use. When transporting and storing, the Summa canister is placed in a plastic shipping container. This will protect the canister from accidental punctures or dents.

4.0 INTERFERENCES AND POTENTIAL PROBLEMS

As long as the gas standards and all transfer lines are clean, no interferences are expected. The initial pressure of the Summa canister should be recorded after filling. In addition, the pressure should be recorded after each use. A dramatic drop in pressure (i.e., five psi or more) may invalidate the use of that canister.

5.0 EQUIPMENT/APPARATUS

- Summa Canister, 6-liter total volume
Cat # 87-300, Anderson Samplers, Inc.
4215 Wendell Drive, Atlanta, GA 30376
PN # 0650, SIS, P.O. Box 8941, 815 Courtney St., Moscow, Idaho 83843
- Certified gas standard from Scott Gas, Matheson or other reliable manufacturer.
- Hamilton gas tight syringe with Teflon seal plugs in various sizes.



STANDARD OPERATING PROCEDURES

SOP: 1706
PAGE: 3 of 10
REV: 0.0
DATE: 09/12/94

SUMMA CANISTER FIELD STANDARDS

- Clean Teflon tubing, 1/4" O.D.
- Swagelok "tee" 1/4" O.D. Teflon
- 1/4" Teflon Swagelok nuts & ferrules.
- 9-mm septa, preferably Teflon backed
- Swagelok on/off or needle valve, 1/4" O.D. stainless steel.

6.0 REAGENTS

All standards must be vapor phase pressurized gas cylinders, certified by the manufacturer to be within $\pm 2\%$ accuracy, and to be NBS traceable. Scott Specialty Gas or Matheson Gas can provide these standards. If field dilution is required, a cylinder of ultra high purity air is required.

7.0 PROCEDURES

1. Obtain a Summa polished canister that has been cleaned and evacuated as per ERT/SERAS SOP #1703, Summa Canister Cleaning Procedures, and select a compressed gas cylinder of a certified standard. This standard should be certified by the manufacturer to be within $\pm 2\%$ for the accuracy of the concentration level and be NBS traceable.
2. A high purity dual stage regulator is attached to the standard cylinder. This must deliver 20-30 psi pressure at an accuracy of $\pm 10\%$ or better.
3. A section of clean, unused 1/4" O.D. Teflon tubing is attached to the Teflon "tee."
4. The side port of the "tee" has an on/off valve or needle valve connected to it (Figure 1, Appendix A).
5. A vent line is temporarily connected to the outlet port of the side valve and placed in a fume hood or on an outside vent. The Summa canister charging system appears in Figure 2 (Appendix A).
6. The standard cylinder is opened at 20-30 psi from the outlet of the cylinder regulator.
7. The needle valve on the Summa canister is still closed at this point. The side valve on the "tee" is opened and the standard cylinder's 1/4" Teflon feed lines are allowed to vent for one-two minutes.
8. The valve is then closed tightly and the needle valve on the Summa canister is slowly opened. A hissing noise should be heard. Do not fill the Summa canisters too rapidly. Allow the canister to continue filling.
9. Periodically check the pressure on the dual stage regulator attached to the standard cylinder to ensure 20-30 psi is being delivered.
10. Once the hissing stops, the canister should be filled to approximately the same pressure as the line delivery pressure.



STANDARD OPERATING PROCEDURES

SOP: 1706
PAGE: 4 of 10
REV: 0.0
DATE: 09/12/94

SUMMA CANISTER FIELD STANDARDS

11. Close the needle valve on the Summa canister tightly.
12. Close the standard cylinder and vent the feed lines.
13. Remove the feed line from the top of the Teflon "tee."
14. Place a Swagelok back ferrule, in the inverted position, on the top of the "tee." This will provide a flat surface on which a Teflon-backed septum can be placed.
15. Place the Teflon-backed septum, Teflon side down. The septum should create a gas tight fit once a 1/4" Swagelok nut is tightened onto the top of the "tee" (Figures 3 and 4, Appendix A).
16. Open the needle valve on the Summa canister to check for leaks throughout the "tee", particularly in the septum fitting. Do this with the valve on the side of the "tee" closed.
17. Afterwards, slowly open the side valve of the "tee" and vent for 1/2 minute and re-close. The septum "tee" is now ready for sampling from the canister using a gas tight syringe through the septum seal.
18. Close the Summa canister needle valve between sample taking with the gas tight syringe.
19. Periodically, vent or flush the "tee" to provide fresh standard for sampling. The side valve can also be used, after flushing, to fill Tedlar bags with the standard from the Summa canister.

8.0 CALCULATIONS

The procedure for performing field dilutions of the standards from the Summa canisters must be documented. This allows for the recalculation of concentrations of standards if any discrepancies arise in the calibration of the field instrumentation. Simple volumetric dilutions using Hamilton gas tight syringes, are performed using Tedlar bags with ultra high purity air as the diluent.

9.0 QUALITY ASSURANCE/QUALITY CONTROL

The concentration levels of the certified gas standards must be recorded. The vendor typically provides the analysis of certification with each standards cylinder; a copy should be provided with the Summa canister.

As previously stated, the pressure of the canister along with the date and time, should be recorded at the initial filling and at the end of each use of the canister. A drop in pressure of 5-10 psi in between usages may invalidate the canister for use as a calibration standard. Certification of canister cleaning and evacuation should be noted prior to filling with standards.

10.0 DATA VALIDATION

This section is not applicable to this SOP.

11.0 HEALTH AND SAFETY

Pressurizing of Summa canisters should be performed in a well ventilated room, or preferably under a fume hood.



STANDARD OPERATING PROCEDURES

SOP: 1706
PAGE: 5 of 10
REV: 0.0
DATE: 09/12/94

SUMMA CANISTER FIELD STANDARDS

Care must be taken not to exceed 40 psi in the canisters. Canisters are under pressure, albeit only 20-30 psi, and should not be dented or punctured. They should be stored in a cool dry place and always be placed in their plastic shipping boxes during transport and storage.

12.0 REFERENCES

This section is not applicable to this SOP.



STANDARD OPERATING PROCEDURES

SOP: 1706
PAGE: 6 of 10
REV: 0.0
DATE: 09/12/94

SUMMA CANISTER FIELD STANDARDS

APPENDIX A
Figures
SOP #1706
September 1994

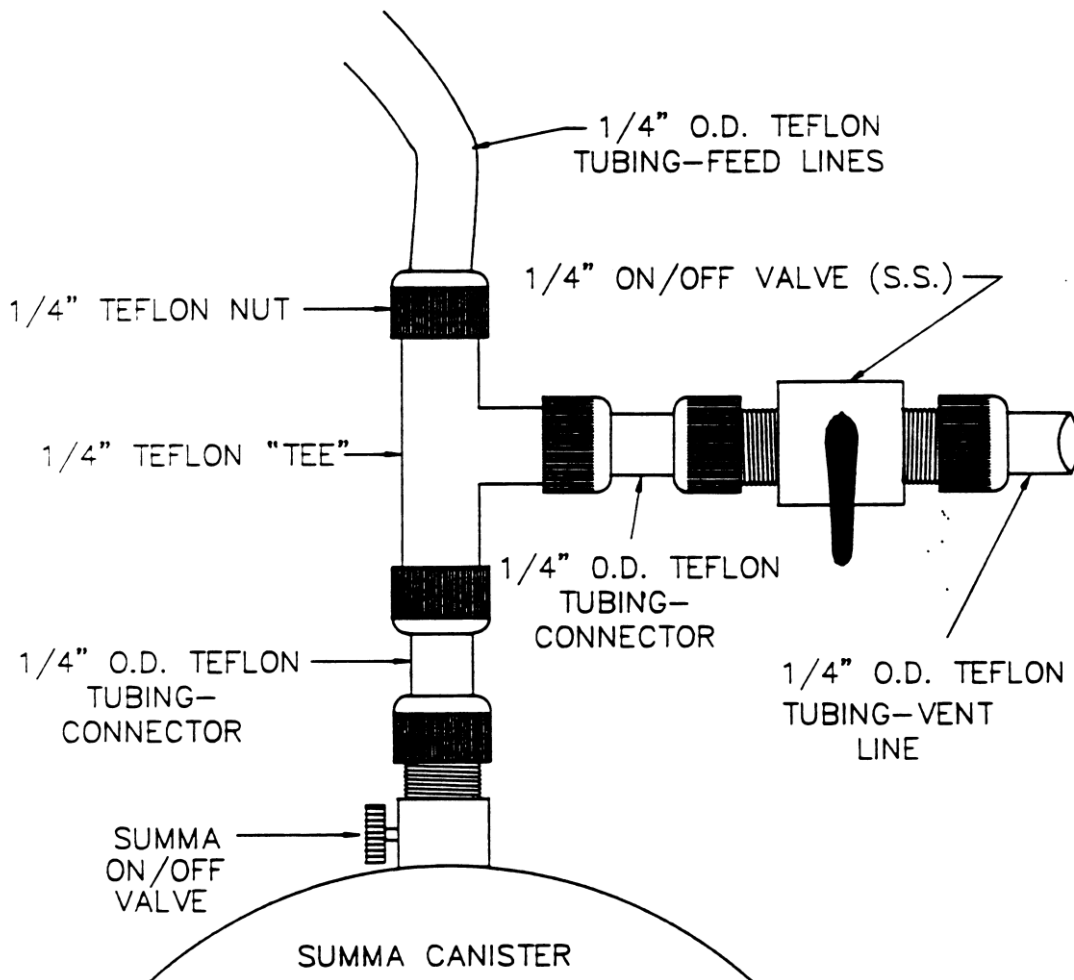


STANDARD OPERATING PROCEDURES

SOP: 1706
PAGE: 7 of 10
REV: 0.0
DATE: 09/12/94

SUMMA CANISTER FIELD STANDARDS

FIGURE 1. Teflon "Tee" Setup



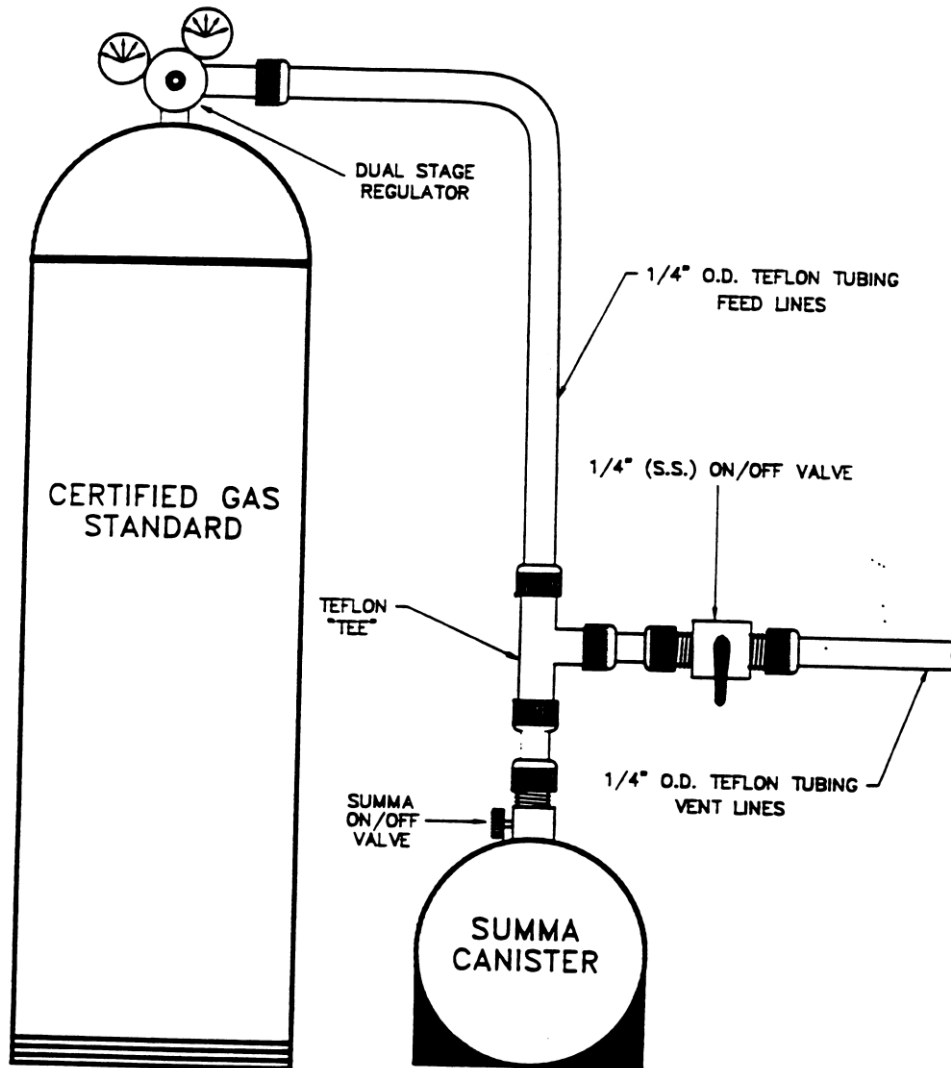


STANDARD OPERATING PROCEDURES

SOP: 1706
PAGE: 8 of 10
REV: 0.0
DATE: 09/12/94

SUMMA CANISTER FIELD STANDARDS

FIGURE 2. Summa Canister Charging System



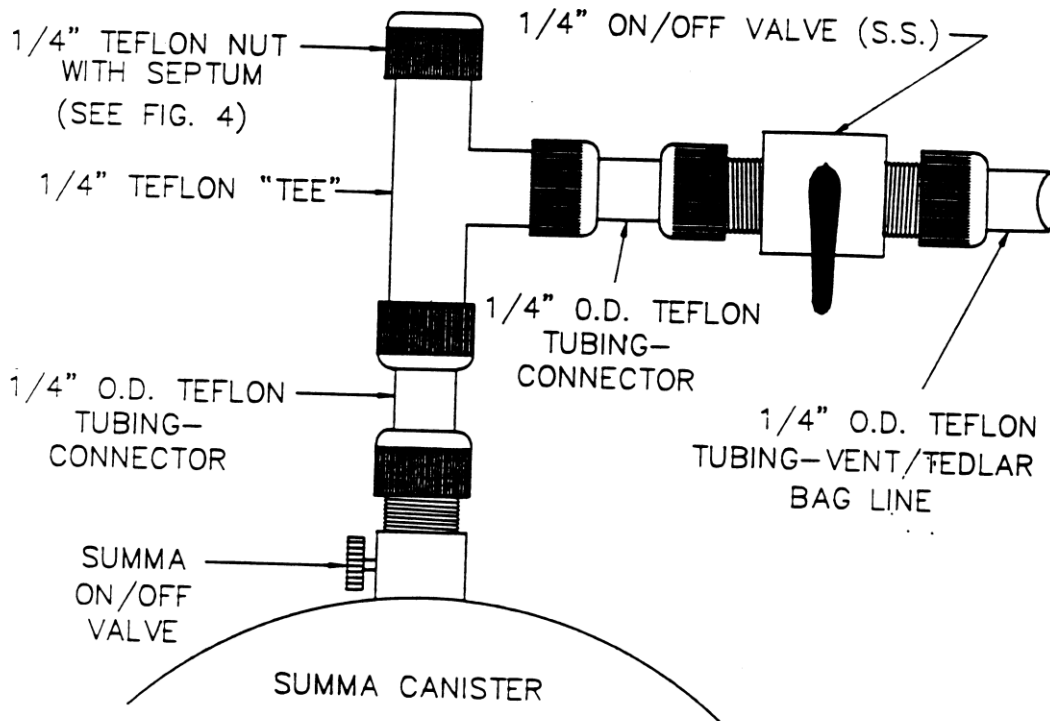


STANDARD OPERATING PROCEDURES

SOP: 1706
PAGE: 9 of 10
REV: 0.0
DATE: 09/12/94

SUMMA CANISTER FIELD STANDARDS

FIGURE 3. Septum "Tee" Setup





STANDARD OPERATING PROCEDURES

SOP: 1706
PAGE: 10 of 10
REV: 0.0
DATE: 09/12/94

SUMMA CANISTER FIELD STANDARDS

FIGURE 4. Teflon Nut with Septum

