INNOVATIVE PRODUCTS

TO-Can™ Air Monitoring Canisters

Optimized for EPA Methods TO-14 and TO-15

RESTEK 20 YEARS

Turning Visions into Reality™

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TO-Can™ Air Monitoring Canisters

Feature	Benefit
High-purity, metal to metal seat, 2/3-turn valve with stainless steel diaphragms.	No sample adsorption, for more accurate results; easy to use.
Vacuum/pressure gauge (optional).	Ascertain internal conditions at a glance.
Variety of sizes.	Meet a range of sampling needs.
Stable to 250°C.	Heat canister to 250°C for superior cleaning.

Optimized for EPA Methods TO-14 and TO-15

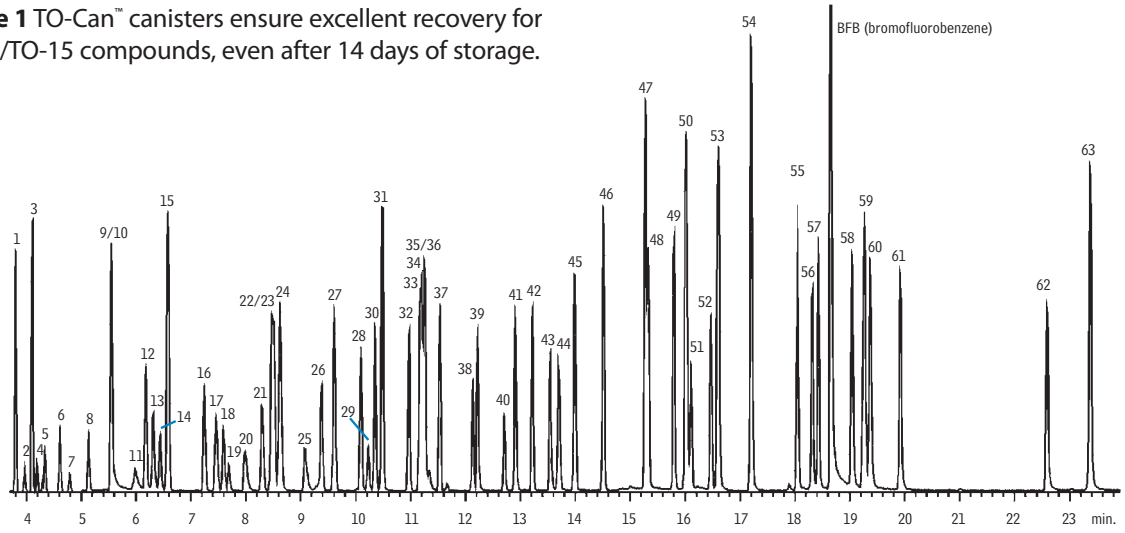
- SUMMA® canister equivalent.
- Excellent analyte recovery—even after 14 days of storage.

US Environmental Protection Agency (EPA) Compendium of Air Methods TO-14 and TO-15 regulate the collection, storage, and analysis of volatile organic compounds (VOCs) using treated air sampling canisters. Restek offers a complete line of TO-Can™ canisters (SUMMA® can equivalent), electropolished using a proprietary process and extensively cleaned using an ultrasonic method. This ensures a high-quality, passivated surface that maintains the stability of TO-14/TO-15 compounds during storage. The frame surrounds the electropolished canister, eliminating welds, and thereby eliminating active sites from the inside surface of the sphere. The Parker Hannifin metal-to-metal diaphragm valve supports the excellent performance of the canister.

These canisters meet the holding time criteria for Methods TO-14/15. A 62-component TO-15 standard (10ppbv each compound) was injected into a TO-Can™ canister and humidified to 70% relative humidity. The TO-Can™ canister demonstrated excellent stability for these polar and nonpolar compounds after 14 days storage (for additonal data, request lit. cat.# 59189A).

The unique holder attaches the handle and base to the canister without welds, and protects the canister, tube stub, and valve. The 2/3-turn diaphragm valve has a metal-to-metal seat, an indicating plate that enables the viewer to discern at a glance whether the valve is open or closed, and a temperature limit of 250°C. We leak check the system with helium to ensure the TO-Can™ canister and valve are leak-tight, then pressurize the canister with contaminant-free nitrogen before we ship it. When collecting VOCs in ambient air, TO-Can™ canisters should be cleaned after each sample collection, and evacuated prior to being sent to the field.

Figure 1 TO-Can™ canisters ensure excellent recovery for TO-14/TO-15 compounds, even after 14 days of storage.



Rtx®-1 60m, 0.32mm ID, 1.0μm (cat.# 10157).
Sample: 200mL of 10ppbv TO-15 standard, injected into TO-Can™ canister and humidified to 70% RH.
Concentrator: Nutech 3550 Preconcentrator
200mL of sample concentrated at -160°C, thermally desorbed at 150°C, and cryofocused at -185°C.
Oven temp.: 30°C (hold 4 min.) to 175°C @ 9°C/min. to 220°C @ 40°C/min.
Carrier gas: helium @ 1.2mL/min.
Det.: Agilent 5971 MS
Scan range: 35-265amu

Chromatogram courtesy of Gina Maio, Severn Trent Laboratories, Inc., Burlington, VT.

Table 1 Holding time criteria for Methods TO-14/TO-15 are easily achieved using a TO-Can™ canister.

Compound	RT	Day 1 ppbv	Day 7 ppbv	Day 14 ppbv
1. dichlorofluoromethane	3.794	10.0	10.0	11.0
2. chloromethane	3.952	9.2	9.0	10.0
3. dichlorotetrafluoroethane	4.096	9.7	9.7	11.0
4. vinyl chloride	4.193	10.0	9.8	11.0
5. 1,3-butadiene	4.327	10.0	9.9	12.0
6. bromomethane	4.601	9.3	8.5	9.7
7. chloroethane	4.774	9.4	8.2	10.0
8. bromoethene	5.117	9.8	8.8	9.7
9. acetone	5.436	9.1	9.4	9.9
10. trichlorofluoromethane	5.527	9.8	10.0	10.0
11. isopropyl alcohol	5.709	10.0	8.8	7.8
12. 1,1-dichloroethene	6.149	9.6	9.6	11.0
13. methylene chloride	6.271	9.1	9.5	9.8
14. 3-chloropropene	6.392	9.1	8.3	8.4
15. carbon disulfide	6.544	8.0	8.9	9.6
16. Freon® TF	6.544	9.3	10.0	11.0
17. *trans*-1,2-dichloroethene	7.196	9.5	10.0	10.0
18. 1,1-dichloroethane	7.394	9.3	9.9	10.0
19. methyl *tert*-butyl ether	7.500	12.0	8.3	8.2
20. methyl ethyl ketone	7.834	9.2	9.1	10.0
21. *cis*-1,2-dichloroethene	8.228	9.6	9.8	10.0
22. bromochloromethane (IS)	8.395	10.0	10.0	10.0
23. *n*-hexane	8.471	9.0	9.4	9.9
24. chloroform	8.532	9.3	10.0	10.0
25. tetrahydrofuran	8.972	8.2	7.2	7.3
26. 1,2-dichloroethane	9.291	9.0	8.1	8.9
27. 1,1,1-trichloroethane	9.549	8.5	7.8	8.6
28. benzene	10.019	9.1	8.7	9.8
29. carbon tetrachloride	10.171	7.3	7.4	7.5
30. cyclohexane	10.307	9.2	9.2	10.0
31. 1,4-difluorobenzene (IS)	10.399	10.0	10.0	10.0
32. 1,2-dichloropropane	10.884	9.8	8.3	8.9
33. bromodichloromethane	11.081	7.2	8.0	8.6
34. trichloroethene	11.127	8.0	8.5	9.3
35. 1,4-dioxane	11.157	7.4	7.9	9.9
36. 2,2,4-trimethylpentane	11.188	7.7	7.9	8.7
37. *n*-heptane	11.461	7.9	8.0	9.0
38. *cis*-1,3-dichloropropene	12.068	7.7	8.3	9.5
39. methyl isobutyl ketone	12.129	8.5	8.6	10.0
40. *trans*-1,3-dichloropropene	12.644	7.5	7.9	8.2
41. 1,1,2-trichloroethane	12.842	8.8	11.0	9.9
42. toluene	13.160	9.0	12.0	11.0
43. methyl butyl ketone	13.464	9.3	9.7	10.0
44. dibromochloromethane	13.631	8.5	8.6	9.2
45. 1,2-dibromoethane	13.919	9.3	9.0	11.0
46. tetrachloroethene	14.481	9.7	8.5	12.0
47. chlorobenzene-d5 (IS)	15.224	10.0	10.0	10.0
48. chlorobenzene	15.285	10.0	9.4	11.0
49. ethylbenzene	15.755	11.0	11.0	12.0
50. xylene (*m,p*)	15.983	20.0	19.0	23.0
51. bromoform	16.059	9.6	8.4	8.5
52. styrene	16.438	11.0	8.3	8.5
53. 1,1,2,2-tetrachloroethane	16.545	11.0	9.1	8.0
54. xylene (*o*)	16.575	12.0	8.9	7.8
55. 2-chlorotoluene	18.017	11.0	10.0	7.8
56. 4-ethyltoluene	18.290	11.0	9.7	7.7
57. 1,3,5-trimethylbenzene	18.396	11.0	10.0	8.4
58. 1,2,4-trimethylbenzene	19.018	11.0	11.0	10.0
59. 1,3-dichlorobenzene	19.246	10.0	10.0	9.9
60. 1,4-dichlorobenzene	19.352	10.0	9.9	10.0
61. 1,2-dichlorobenzene	19.898	10.0	10.0	10.0
62. 1,2,4-trichlorobenzene	22.569	12.0	11.0	10.0
63. hexachlorobutadiene	23.358	12.0	11.0	10.0

TO-Can™ Air Monitoring Canisters

Optimized for US EPA Methods TO-14 and TO-15

Description	qty.	cat.#
1L Volume		
TO-Can™ Canister, 1/4" Valve	ea.	24172
TO-Can™ Canister with Gauge, 1/4" Valve	ea.	24176
TO-Can™ Canister with No Valve	ea.	22094
3L Volume		
TO-Can™ Canister, 1/4" Valve	ea.	24173
TO-Can™ Canister with Gauge, 1/4" Valve	ea.	24177
TO-Can™ Canister with No Valve	ea.	22095
6L Volume		
TO-Can™ Canister, 1/4" Valve	ea.	24174
TO-Can™ Canister with Gauge, 1/4" Valve	ea.	24178
TO-Can™ Canister with No Valve	ea.	22096
15L Volume		
TO-Can™ Canister, 1/4" Valve	ea.	24175
TO-Can™ Canister with Gauge, 1/4" Valve	ea.	24179
TO-Can™ Canister with No Valve	ea.	22097

Quickly confirm vacuum or pressure. Request a high-quality gauge mounted on your TO-Can™ canister.

also **available**

Passive Air Sampling Kits

- Improved design eliminates leaks at the filter.
- Siltek®-treated components available, to ensure a very inert surface.
- Available in six sampling flow ranges.

SilcoCan™ Canisters

Ideal for low-level reactive sulfur compounds (1ppb-20ppb)

- Improved design: canister holder and valve bracket effectively protect the canister, tube stub, and valve.
- Excellent long-term storage of polar and nonpolar volatile organics in ambient air, including parts per billion levels of active sulfur compounds.
- Eliminate adsorption problems with active compounds.

Analytical Reference Gas Mixtures

For more information, request our catalog or visit our website at www.restek.com.

ordering **note**

Restek canisters are originally equipped with high-quality Parker Hannifin diaphragm valves. Each valve is helium leak-tested to 4 x 10^{-9}cc/sec. The all-stainless steel construction eliminates contamination and the valve functions at temperatures from -100°C to 250°C. Compression outlet fitting, indicator plate to display open or closed position, 1/4" inlet and outlet.

did you **know**?

Restek canisters are shipped in reusable boxes with handles for easy carrying, eliminating costly carrying cases.

RESTEK 20 YEARS

Lit. Cat.# 59285A