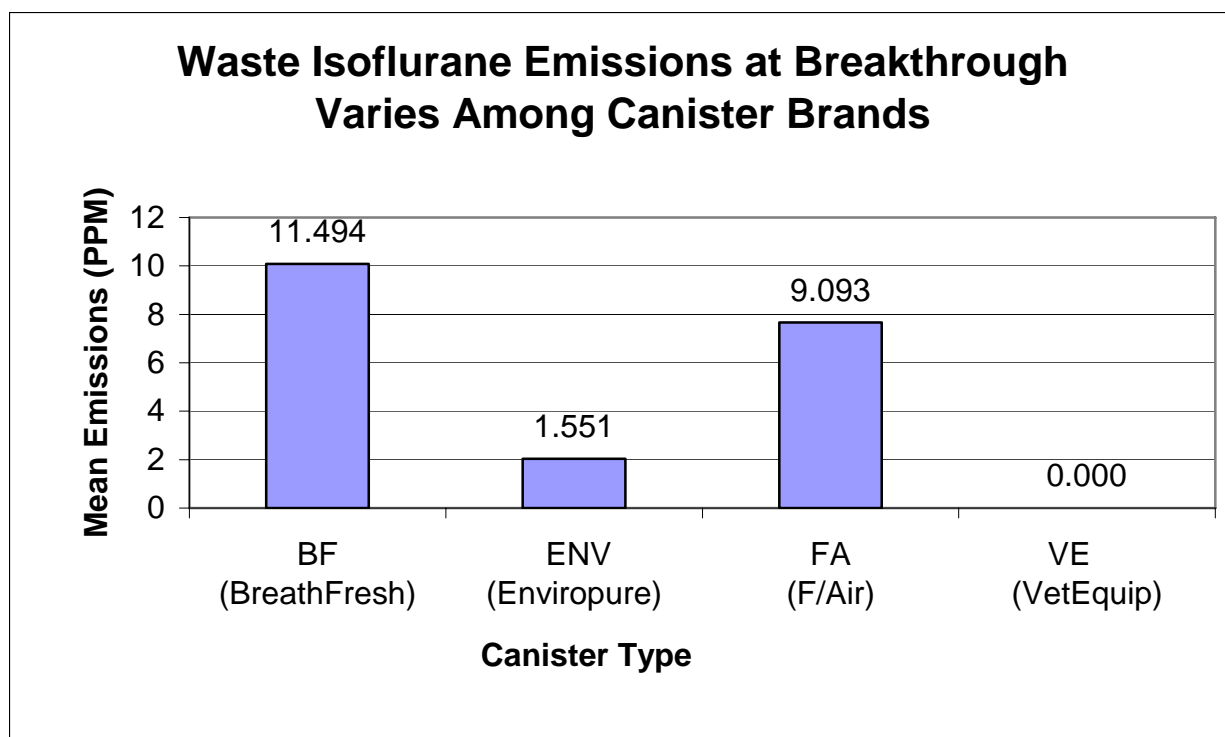


VaporGuard Activated Charcoal Filters

Many facilities voiced concern after a March 2002 Contemporary Topics article discussed activated carbon (charcoal) canisters and their failure rate when used to trap anesthetic waste gas. One of the three canisters carefully tested was a brand we were selling at that time. As a result of the study, we began designing a new canister that might not have the same issues as the three brands then commercially available. After nearly one year of R&D, we sent our working prototype to the study authors who kindly agreed to reproduce their initial study, using our VaporGuard prototype. The results were very positive and we have printed them here for your review and convenience.



Breakthrough of Waste Isoflurane Emissions Varies Among Canister Brands and Between Canisters

Data taken from Smith and Bolon
(Contemporary Topics in Laboratory Animal Science 42 (2) 10-15, March, 2003)
and presented here with written permission from Contemporary Topics in Laboratory Animal Science.

Canister Type	Charcoal Canister No. ¹	Canister Weight Change at initial Breakthrough ²	Percent of Maximal Use-Life ³	Isoflurane Level (ppm) at Breakthrough	Canister Weight Change at Peak Isoflurane Emission	Peak Isoflurane Emissions (ppm) ⁴
BF (BreathFresh)	1	4	4	2.0	39	11.5
BF (BreathFresh)	2	17	34	4.1	44	33.5
BF (BreathFresh)	3	9	18	31.4	28	52.8
BF (BreathFresh)	4	5	10	4.1	13	29.0
BF (BreathFresh)	5	7	14	3.6	32	17.5
BF (BreathFresh)	6	11	22	15.3	49	66.2
ENV (Enviropure)	1	54	108	2.1	31	0.6
ENV (Enviropure)	2	21	42	1.7	7	1.7
ENV (Enviropure)	3	N/A	-	0	44	1.0
ENV (Enviropure)	4	24	48	1.7	24	1.7
ENV (Enviropure)	5	2	4	4.8	2	4.8
ENV (Enviropure)	6	2	4	1.9	48	3.2
FA (F/Air)	1	9	18	2.9	48	33.0
FA (F/Air)	2	5	10	6.0	46	>100
FA (F/Air)	3	7	14	1.6	37	12.6
FA (F/Air)	4	7	14	4.0	50	37.4
FA (F/Air)	5	8	16	25.9	34	62.8
FA (F/Air)	6	10	20	5.6	39	54.4
VE (VetEquip)	1	N/A	-	0	N/A	0
VE (VetEquip)	2	N/A	-	0	44.6	0.2
VE (VetEquip)	3	N/A	-	0	N/A	0
VE (VetEquip)	4	N/A	-	0	40	0.1
VE (VetEquip)	5	N/A	-	0	43.5	0.1
VE (VetEquip)	6	N/A	-	0	35.7	0.2

Notes: Canisters were attached to the non-rebreathing circuit with the stopcock to the induction box closed during spectrophotometry testing; Canister weights are shown in grams.

¹Data for BF (Breath Fresh, Jorgensen Laboratories, Loveland, CO), ENV (Enviropure, SurgiVet Inc., Waukesha, WI), and FA (F-Air, A.M. Bickford, Wales Center, NY), were published previously in Smith and Bolon (Contemporary Topics in Laboratory Animal Science 42 (2) 10-15, March, 2003). The VE (Vet Equip, Pleasanton, CA) data was acquired in a subsequent study. Data for all canister types was collected in a uniform manner (2% Isoflurane carried in 1 L/minute oxygen), with standard equipment and use practices.

²Initial breakthrough denotes emission of isoflurane levels of at least 2 ppm.

³Maximal use-life (as defined by the manufacturer's specifications) is a weight change of 50 grams from the baseline canister weight.

⁴Peak emission denotes the highest reading during the course of each canister's rated use life (i.e., weight change of 50 grams).