

Vetamac Vapors

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If you find the topics discussed in our newsletter helpful or if you have questions, please email us at info@vetamac.com. If you would like to read past issues, those may be accessed on our website, www.vetamac.com

Carbon Dioxide Removal Part III

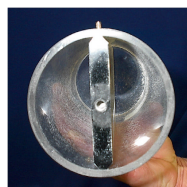
The last two issues of "Vapors" have discussed the chemical removal of carbon dioxide by granules composed of barium hydroxide and calcium hydroxide. This issue will discuss how the canister that contains the absorbent can affect the efficiency of absorption.

There are two types of canisters defined by the movement of gas through the canister. If the gases go only one way thru the canister, the canister will be open on top and will have a perforated bottom with a gasket or o-ring that seals both top and bottom surfaces of the canister. If the canister contains a baffle or a return tube in the center of the canister such that gas comes in the top, flows to the bottom, around the baffle and back to the top, there will be a seal only on the top surface. These two types of canisters can be described either as "one-way" or "two-way" canisters.

Since the one-way canister has a seal on both the top and bottom surfaces, there is a greater potential for leaks. Soda sorb granules and dust can accumulate on the lower gasket or sealing surface and prevent the canister from forming a tight seal. This is one of the most common causes of leaks in an anesthetic circuit and care must be taken to assure that all surfaces are clean and free of soda sorb dust and granules.

The two-way canister has less potential for leaks since it seals only at the top of the canister. However, since there is usually a tube down the center of the canister, the tube should be covered or plugged when being filled to prevent spilling of granules into the tube. Failure to remove the plug before attaching the canister to the machine will result in very high resistance to breathing. Some two-way canisters that have a baffle in the center have a threaded insert that fastens the canister to the machine. This insert must be covered when filling the canister to prevent soda sorb from getting into the threads. It is not necessary to fill soda sorb canisters to the very top. This can result in granules falling off or rubbing against the surface of the absorber gasket as the canister is placed into position on the absorber assembly. A 1/2 to 3/4 inch space should be left at the top of the canister.

The resistance to flow of gas along the inside wall of the canister and along any baffle or return tube (in a "two-way" canister), is less than in the center of the absorbent mass. This is known as the "wall effect" and is caused by the open spaces created where the granules contact the smooth surface because there are no protuberances from nearby granules to fill the spaces.



Two-Way



One-Way

To help minimize this effect, the granules should be packed by tapping the sides of the canister. This facilitates a more uniform flow through the canister.

Channeling is a pattern of non-homogeneous flow through the center of the absorbent mass. If the granules are not packed uniformly, the gas will follow the path of least resistance through the granules. This forms channels that bypass most of the absorbent. This effect can also be prevented by proper packing of the granules.

The following chart summarizes the difference between the two types of canisters.

	Two-Way	One-Way
Potential for Leaks	Less	More
Filling	More Difficult	Easy
Potential for Wall Effect	More	Less
Potential for Channeling	Same	Same

By Harry Latshaw
MS, RVT, VTS (Anesthesia)

FAQs

Q: Why is our soda sorb turning completely blue so quickly?

A: We have received several complaints recently of the soda sorb turning blue within 2-3 hours of use. On one occasion, I have seen the whole canister blue after only two days. This problem should be referred to the distributor that sold the soda sorb.

If you have a question you would like answered in our FAQs, please email us at info@vetamac.com.