# EFFECTS OF GRANULAR CHANNELING ON SAFETY AND VALUE

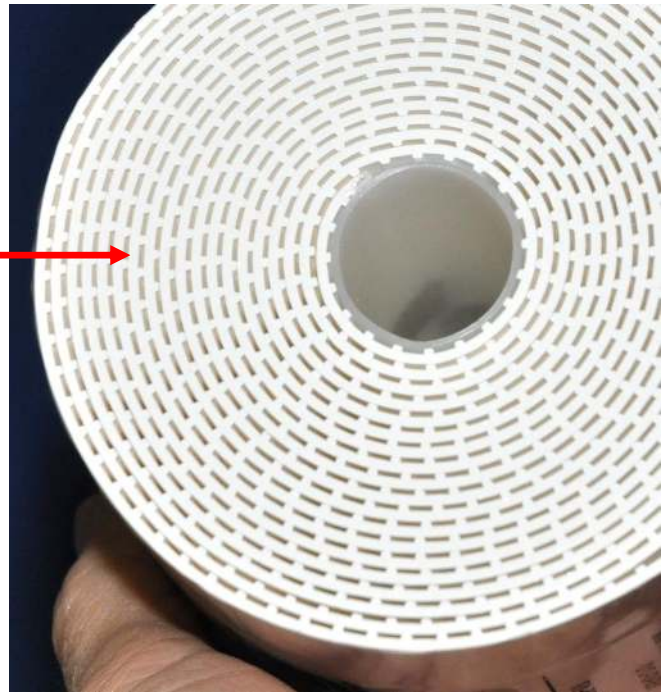
# SpiraLith Ca

## *An Evolutionary Advance in Carbon Dioxide Absorbent Technology*

No Granules – No Channeling – No Dust

The solid cartridge is engineered with uniform flow pathways

- Insures gasses contact all reactive surfaces
- Guarantees reliable and repeatable performance
- Minimizes wasted absorbent



Prototype cartridge in lab testing demonstrates uniform flow and optimal utilization of absorbent material

# What is Channeling?

Channeling occurs when exhaled gas finds the path of least resistance through the granules bypassing reactive material

- Caused by random distribution/settling of absorbent during manufacturing, shipping, and use


*Notice indicator change showing path of gas flow and unreacted absorbent*

# Effects of Channeling

- Unreacted absorbent remains when absorbent is changed
- Indicator change may not be visible to the provider
- Potential for rapid CO2 breakthrough with significant rebreathing, often without corresponding visual indication
- Unpredictable performance leading to exchanging absorbent earlier than needed  and/or in the middle of a procedure
- More frequent exchanges
- Wasted absorbent/wasted money
- Adverse environmental impact of higher pH (unreacted absorbents) entering landfills

# Forms of Channeling

- Random
  - Gas finds multiple paths through the absorbent bed
- Wall effect
  - Gas flows along the smooth wall of the canister, bypassing much of the absorbent available
- Core Channeling
  - Potentially dangerous since the center of the cartridge is completely consumed, often without a visible indication of exhaustion when viewed from the outside. Capnography will indicate rebreathing but the cause may not be obvious and is often missed

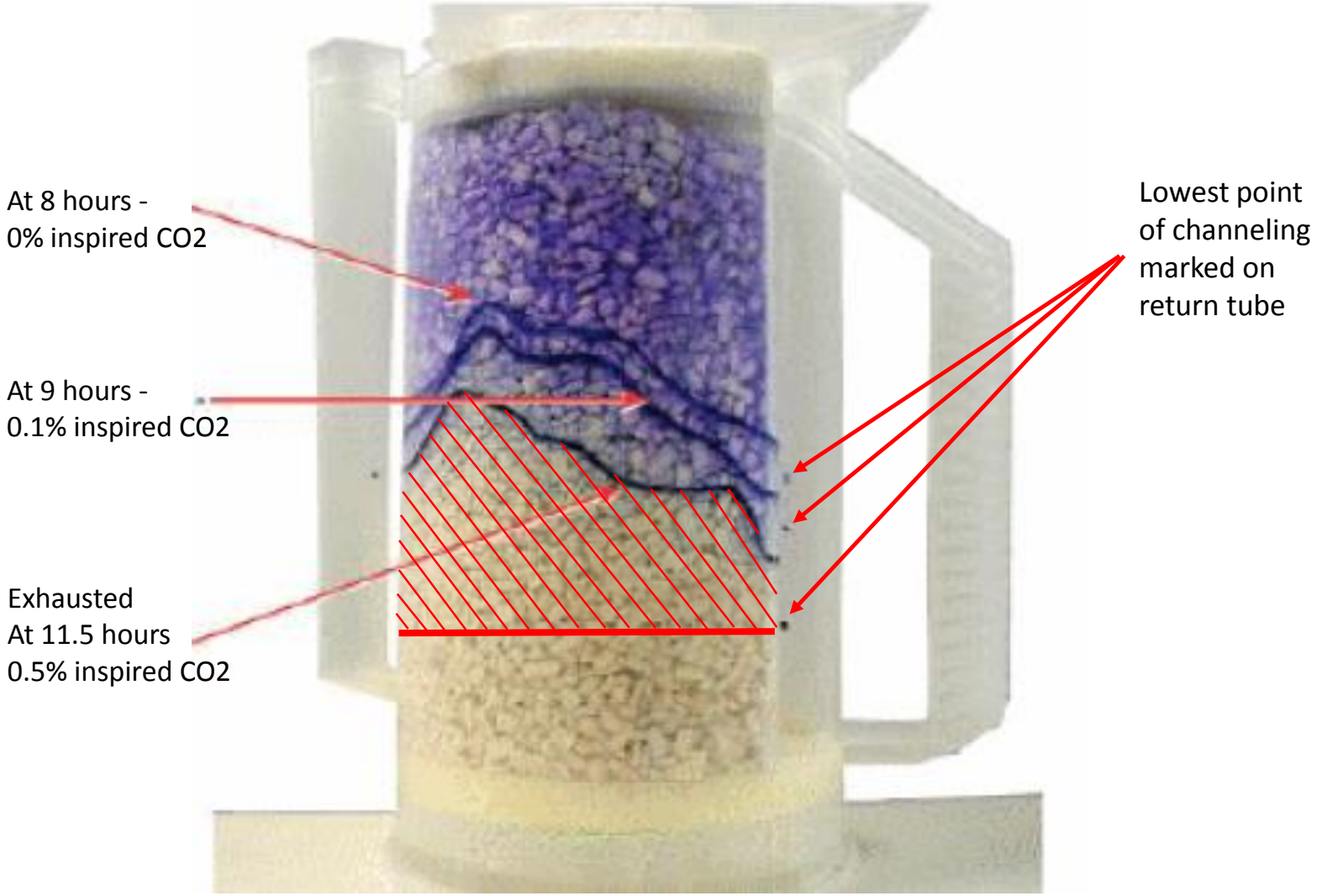
# Examples – Core and Random Channeling

## Core Channeling

## Random Channeling

# Examples – Wall Effect Channeling

Area between 3 black lines = 0 – 4 mmHg inspired (CO2 capnography)
Area in RED is wasted absorbent



SpiraLith Ca
$CO_2$ ABSORBENT

# Introducing The First Ever Color Indicator Window System

## The Most Accurate and Easy To Interpret Color Indicator System


New Color Indicator Window

- Helps predict when inspired $CO_2$ approaches 0.5%
- Bold, fade-resistant color
- Uses 1000X less ethyl violet compared to granules


- Color Windows enable you to see inside the cartridge
- Our color indicator windows let you know when it is time to change out the cartridge





Note that inspired CO2 remains at or near zero until 3 bars have turned blue.


# Advantages of Solid Cartridge™ Technology

**Capacity**

- No channeling of gases – all absorbent is exposed to exhaled gas
- Maximum surface area for reaction with carbon dioxide in exhaled gases
- Greatest volume of CO2 absorbed per mass of absorbent purchased

**Reliability**

- Reliable and repeatable performance for every cartridge
- Unique widow system is the most accurate and easiest to interpret color indictor available
    - Reliably shows progressive utilization and remaining absorbent

**Safety**

- No caustic dust
    - Easily handled with no risk to patients or staff
    - Does not contaminate ventilation equipment with dust
    - No restrictions on disposal
- Low flow formulation
    - No production of Compound A or Carbon Monoxide

**Ecology**

- Reduced environmental impact
    - Promotes safe use of reduced fresh gas flow rates
    - Less absorbent material is used
    - Lower pH due to reduction of unreacted material in waste stream

# SpiraLith Ca by Micropore Inc.

## *An Evolutionary Advance in Carbon Dioxide Absorbent Technology*

Vince Suddard , Product Specialist
Micropore Inc.
1000 Konica Drive, Elkton, MD 21921
443-245-4127

*Distributed by*

**SOVEREIGN MEDICAL, INC**

620H Valley Forge Rd,  Hillsborough, NC 28272

919-644-1113  sovmed.com