



MICROPURE[®] FILTRATION



CO₂ Filtration System

CO2 Guidelines

ISBT Standards for CO2 Quality in food and beverage CO2 applications

Potential Contaminant	Critical Limit	Rationale ^t
Total Volatile Hydrocarbons (as Methane)	50 ppm v/v max including 20 ppm v/v max as total non-methane Hydrocarbons	Sensory
Aromatic Hydrocarbon Content	20 ppb v/v max	Regulatory
Acetaldehyde	0.2 ppm v/v max	Sensory
Total Sulphur Content	0.1 ppm v/v max	Sensory
Sulphur Dioxide	1 ppm v/v max	Sensory
Moisture	20 ppm v/v max	Process
Nitric Oxide/Nitrogen Dioxide	2.5 ppm v/v max	Process

Rationale Descriptions:

Sensory: Any Attribute that negatively impacts taste appearance or odor

Process: Any attribute that defines a key parameter in a controlled process and an important consideration in the beverage industry

Regulatory: Any Attribute whose limit is set by governing regulatory agencies.

SulfurGuard System Highlights

- Added security of CO2 quality
- Protection against impurities known to result in beverage flavor defects
- Effective for removing a combination of potential contaminants
- Low pressure drop
- Easy to use and operate as part of any system
- Wide range of housing sizes to fit a variety of application flow rates and pressures
- Variety of connections to fit your current piping
- Long Filter Life
- Low operation Costs
- Simple Effective Design
- Easy maintenance, disposable cartridge design
- Compact Independent housing design
- 10 year housing guarantee
- Approved for use by Coca Cola and Pepsi

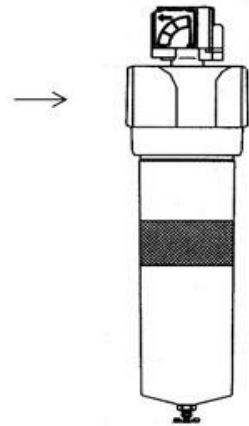
SulfurGuard Filter System Stages

Micropure Filtration Inc. Filter Placement: Beverage Application

Coalescing

Stage I

Oil and Liquid Coalescing Filter. Micron Rating of 0.01 for particles, oils and Liquids.



Activated Carbon

Stage II

Activated Carbon Filter for absorption of aromatic carbons and carbon based molecules.



Sulfur Guard™

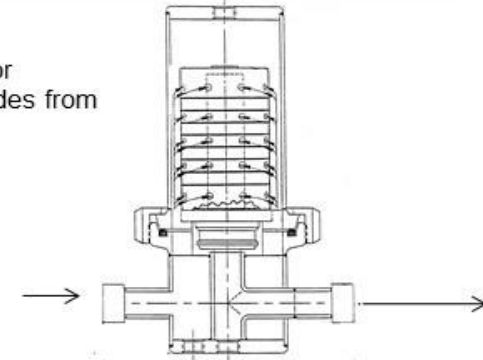
Stage III

SulfurGuard Filter for removal of any sulfides from Stream.



Sterile Filter

Stage V



Sterile Filter. Filter Rated at 0.002 Micron for all particles and contaminants in CO2 stream.

Contaminant Absorbation by Stage

Contaminants	Coalescing	Actived Carbon	SulfurGuard
	Stage 1	Stage 2	Stage 3
Bezene	0	1	2
Toluene	0	1	2
Xylene	0	1	2
Cyclohexane	0	1	2
Aetaldehyde	0	1	1
2-Butanone	0	1	1
Dimethyl Ether	0	1	2
Ethyl Acetate	0	1	2
Styrene	0	1	2
MIBK	0	1	2
Ethanol	0	1	2
Methanol	0	1	2
Water	2	0	0
Oil	2	0	0
COS	0	1	2
H ₂ S	0	1	2
SO ₂	0	1	2

Key for Chart	
No Absorption	0
Partial Absorption	1
Complete Absorption	2

Stage 1 Coalescing Filter

Coalescing is the separation of liquid aerosols and droplets from a gas. Using a coalescing filter element, the gas passes the filter element from the inside out.

The fine liquid aerosols and droplets are captured by the fibers in the inner layer where they run together along the fibers to form larger drops. These drops are forced to the outside of the filter element and drain to the bottom of the housing by gravity.

The condensate drain at the bottom of the filter element allows for easy removal of the captured liquid.



Stage 2 Activated Carbon Filter

The Activated Carbon removes general Aromatic Hydrocarbons from the CO₂ Stream.

Filter has predictable life span based off CO₂ quality and CO₂ consumption

Multiple element sizes to give customer low PSID & long element life



Stage 3 SulfurGuard Filter

Works in conjunction with stage 2 filter. Filter is designed to remove H_2S and COS for CO_2 Stream

Filter has predictable life span based off CO_2 quality and CO_2 consumption

Multiple element sizes to give customer low PSID & long element life



Stage 5 Sterile Filter

Last Filter in Line for CO₂ system. Unit can be installed in series or a point of use.

Filter has predictable life span based off CO₂ quality and CO₂ consumption

Multiple element sizes to give customer low PSID & long element life





1 Inch SulfurGuard System with aluminum filter housings(stage V is stainless steel)
1,000 lb/hr of CO₂ flow



Large ASME housing used in application. Flow volume 5,000 lb/hr. Stage 1 and 5 in different rooms because of room size.



5 Vessel System to Handle 15,000 lb/hr flow rate.

Flow goes through filter in foreground first(PCF model)

Stage 2(PAKC) and 3(PAKSGX) are run as duplex to increase flow capacity