

# Application Note

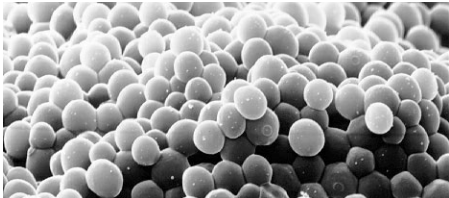
## Technical Application Publication

### Removal of yeast from carbon dioxide recovered from fermentation



Environmental, quality and logistical drivers mean that there is greater emphasis on the recovery of carbon dioxide gas from fermentation for use in the carbonation of beverages. The gas from such sources contains microorganisms associated with the fermentation process. These need to be removed prior to using the gas as a beverage ingredient.

In particular, presence of viable yeast cells can lead to fermentation occurring in final small pack, resulting in flavour and appearance taints and potential hazard due to additional gas pressure within the can or bottle.



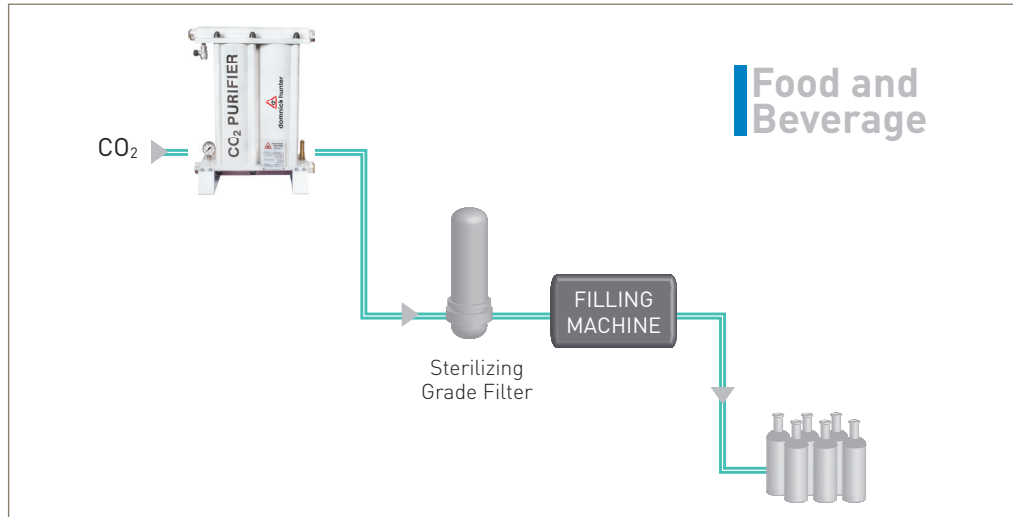
Brewing Yeast Cells

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## Requirement:

Removal of all yeast and other microorganisms and particulate in the carbonation supply lines to packaging processes.

## Method:

1. Installation of a filter that has been validated to provide sterile gas filtrate.
2. Size options to position the filter at point of use (recommended) or further upstream within the carbon dioxide supply lines (if necessary).
3. Procedural guidelines for the installation, operation and maintenance of the filters.
4. A validated procedure to carry out a non-destructive integrity test on the filter on a periodical basis to ensure continued efficacy for application.

## Operation and maintenance<sup>(1)</sup>

### Replacement of the filter cartridge

Change every 6 months OR if the differential pressure reaches 2 times its clean value OR if the filter fails integrity test.

### Steam sterilization and testing

Steam sterilize or autoclave the filters on a regular basis or if a significant level of yeast in the supplied gas is detected. Check the integrity of the filters using a Valairdata 3 after every sterilization.

<sup>(1)</sup>Detailed procedures are available from the Technical Support Group

## Filter specification:

The filter consists of two main components:

1. A stainless steel housing installed in the gas line.
2. A replaceable cartridge. This utilizes either a glass microfiber filtration medium or a microporous PTFE filtration membrane.
3. All materials of construction of the housing, filter and associated seals and pressure gauges are suitable for food contact.
4. The capability to be steam sterilized, either in place for larger assemblies or by removal for autoclaving for smaller or point of use filters.

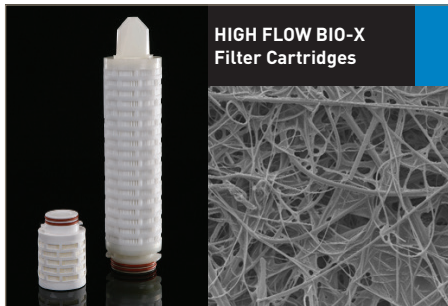
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# Filter sizing

Flow range	Pressure range	Cartridge part code	Housing part code	Housing connections	Pressure drop (approx in mbar)
300Kg/Hr	6-7 barg	ZCHB-KC	VBACE-13k	1.5"	50
600Kg/Hr	6-7 barg	ZCHB-1C	VBACE-141	2"	57
1200Kg/Hr	6-7 barg	ZCHB-2C	VBACE-142	3"	80
2000Kg/Hr	6-7 barg	3 x ZCHB-1C	ZVACE-031D	3"	65
3000Kg/Hr	6-7 barg	3 x ZCHB-2C	ZVACE-032D	3"	60

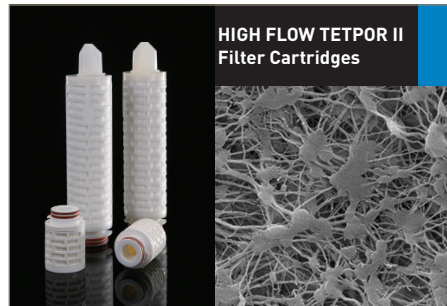
Pressure drops calculated for standard pipe sizes, without restrictions from further fittings. All pressure drops calculated at 25 °C using 6 bar line pressure. All calculations conducted for gaseous CO<sub>2</sub>.

## Filter descriptions



- Validated to pharmaceutical sterilizing standards
- Aerosol challenge using *Brevundimonas diminuta* bacterium and MS-2 Coliphage virus

**HIGH FLOW BIO-X** filter cartridges are designed to sterilize process gas streams. They use a PTFE impregnated borosilicate glass microfibre medium with extremely high internal voids volume that maximizes flow and minimizes pressure drop. The cartridges can be steam sterilized *in-situ* using either in-line steam or by autoclaving the housing / cartridge combination.



- Optimum pleat configuration
- Integrity testable by all methods including Water Intrusion Test
- Absolute rated filtration
- Unrivalled flow rates combined with low pressure drops

**HIGH FLOW TETPOR II** filter cartridges are also used for sterilizing gases, but utilize a PTFE microporous membrane to filter the gas. Use of a membrane can be beneficial if there is a possibility of moisture in the gas stream as the membrane resists wetting and potential liquid carry-through of microorganisms.



- Designed to maximize flow and minimise pressure drop
- Plenum base ensures collection of condensate minimizing the chance of filter blinding / high differential pressure

A sanitary range of flow efficient housings from Parker domnick hunter, designed to complement the latest generation of compressed air and gas sterile filter cartridges and steam filter elements.

## Integrity testing



The new Valairdata 3 has been designed utilizing state-of-the-art technologies and 40 years of experience in the provision of sterile air and gas filtration solutions. It is the quickest and easiest way to verify the integrity of sterile gas filter systems and is fully 21CFR - PTII compliant.

- Enhanced-life and lightweight battery
- Provides fast and reliable filter integrity testing in-situ.
- Results obtained in seconds
- Test filter can be introduced back into process immediately after testing
- Results correlated to an aerosol bacteria and viral challenge
- Lightweight, portable design
- Touchscreen operation.