

## Liqui-Cel<sup>®</sup> Membrane Contactors are widely used in the soft drink and brewing industries to Control dissolved gasses

Gas control is an important concern in the beverage industry. Oxygen in the water can oxidize flavor components and shorten the shelf life of the product. Carbon dioxide can also have an impact on taste and pH of the product.

Liqui-Cel Membrane Contactors utilize a hydrophobic polypropylene membrane to remove dissolved gasses from water. Water flows on one side of the membrane and a vacuum or strip gas is passed on the other side of the membrane. By controlling the pressures of gasses in contact with the water, a highly efficient method for gas control can be achieved.

Membrane contactors are widely accepted to control gas levels in liquids used in the soft drink and brewing industries. Some of the applications that membranes have been used for in these industries are listed below.

### Soft Drinks/Coffee/Teas

#### Deoxygenation/Carbonation of blending water

- In packaging plants, water and syrup are mixed prior to being bottled or canned. In this application, oxygen is removed from blending water prior to blending.
- Carbon dioxide can also be added to liquids for precise control the CO<sub>2</sub> levels prior to packaging.

#### Deoxygenation of water used to brew canned coffee and teas

- Flavor is improved if the water is first deoxygenated prior to brewing and packaging coffee and teas. Oxygen negatively impacts the taste and the shelf life of these products.

#### Deoxygenation of water used to reconstitute fruit juices

- Water blended with concentrated fruit juice should also be oxygen free. Oxygen will shorten shelf life and oxidize some of the flavor components.

### Brewing

#### O<sub>2</sub> removal from blending water

- Oxygen can break down the final product if it is not removed from the water used in the blending process. For this reason, O<sub>2</sub> specifications are typically less than or equal to 10-ppb.

#### O<sub>2</sub> removal of pushing water

- In breweries, large volumes of product is left in DE filters and piping. In order to collect and use the product, the brewery will pump water through the system to “push out” the beer.
- The O<sub>2</sub> specification here is also less than or equal to 10-ppb. Low O<sub>2</sub> concentrations are important because the product will absorb any gasses present in the pushing water.



#### CO<sub>2</sub> Control of Beer

- Adjust carbonation level on beer. Sometimes natural fermentation does not create enough CO<sub>2</sub> for the end product which impacts taste and the head of a beer. On the same note, removal of excess CO<sub>2</sub> in over-carbonated beer is also an easy process with Membrane Contactors.

**Nitrogenation of Beer**

- There is a niche market for stout beer where N2 is added to beer to improve the foam head on top of the beer.

**Deoxygenation of Beer**

- Membrane contactors are also used for the removal of oxygen that can be picked up in beer during transfer.

**CO2 scrubbing**

- The CO2 is scrubbed with water to remove contaminants from the fermentation process (phenols, alcohol and other organics). Scrub water should be deoxygenated prior to scrubbing to prevent oxygen from contaminating the CO2.

**H2S removal**

- Well water may contain H2S and this must be removed or it will negatively impact the flavor of the final product.

Membrane Contactors are used in any part of the beverage process where gasses need to be removed, added or controlled to a specific level.

**Some of the features and benefits that the membrane systems offer are:**

FEATURE	BENEFIT
Modular, compact system	Small footprint that can be placed anywhere in the plant
Only 7.5 HP needed to run O2 level below 10 ppb, based on 250 gpm and temperature of 40 F	Low energy consumption No need to heat up water, then cool it down
Simultaneous Gas transfer operation (carbonation/nitrogenation and deoxygenation in one module or one system)	Lower capital costs of equipment Replaces steam deareator and CO2 control system
Better quality control	Lowers operating costs Efficient gas control/utilization

Liqui-Cel® Membrane Contactors are available in a wide variety of sizes to meet the needs of many applications. For the beverage market, all components of the Liqui-Cel® Extra Flow Membrane Contactor, when used in accordance with recommendations given in our product literature for treatment of processing water, alcoholic and non-alcoholic beverages, and aqueous, acid and non-acid food products at and below ambient temperatures, are in compliance with all relevant FDA regulations as specified in Title 21 of the Code of Federal Regulations.

This product is to be used only by persons familiar with its use. It must be maintained within the stated limitations. All sales are subject to Seller's terms and conditions. Purchaser assumes all responsibility for the suitability and fitness for use as well as for the protection of the environment and for health and safety involving this product. Seller reserves the right to modify this document without prior notice. Check with your representative to verify the latest update. To the best of our knowledge the information contained herein is accurate. However, neither Seller nor any of its affiliates assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of the suitability of any material and whether there is any infringement of patents, trademarks, or copyrights is the sole responsibility of the user. Users of any substance should satisfy themselves by independent investigation that the material can be used safely. We may have described certain hazards, but we cannot guarantee that these are the only hazards that exist.

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