

## Liqui-Cel® Membrane Contactors Easily Improve Megasonic Cleaning Performance by Controlling Total Dissolved Gases

The amount of dissolved gases present in water has a direct impact on cleaning efficiency in a megasonic-cleaning bath.

UltraPure Water (UPW) from the polishing loop is commonly used in the megasonic cleaning process. Depending on the process design of the system, there are typically two scenarios in the system setup.

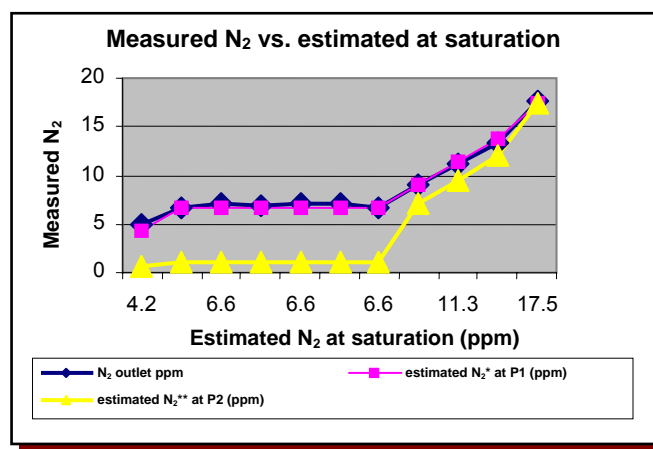
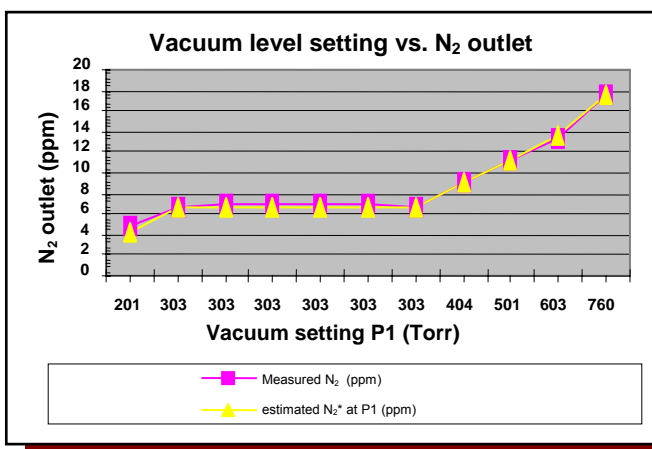
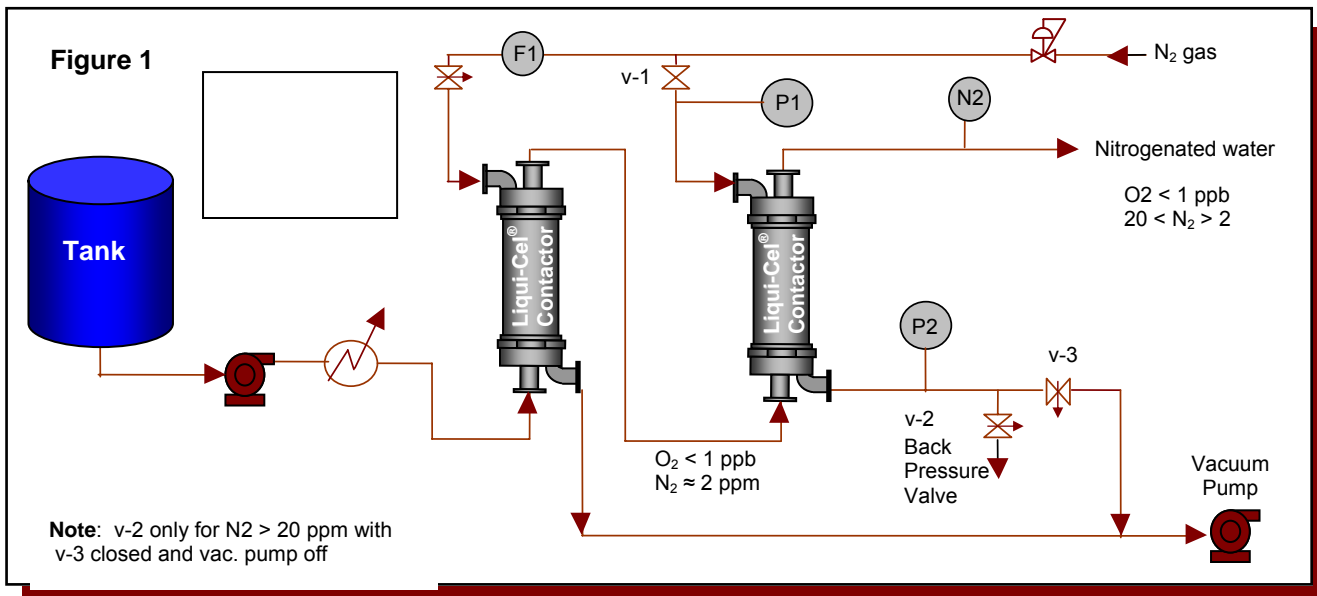
First, a system containing Liqui-Cel Contactors could be located in the polishing loop. Here the typical dissolved gas requirement is less than 1 ppb for O<sub>2</sub> and around 3 ppm for N<sub>2</sub>.

Second, a Nitrogen blanketed tank could be located in the polishing loop. The typical dissolved gas requirements in this scenario are less than 1 ppb for O<sub>2</sub>.

Dissolved N<sub>2</sub> would be saturated at  $\approx 20$  ppm because of the N<sub>2</sub> pressure from the N<sub>2</sub> blanket on top of the tank.

In both cases, the N<sub>2</sub> gas can be easily manipulated by using a simple Liqui-Cel Membrane Contactor set-up at the point of use prior to the megasonic bath. In the first case the addition of N<sub>2</sub> would be necessary, while in the second case, dissolved N<sub>2</sub> would need to be removed.

Recent test results at a semiconductor plant verified that at specific water flow conditions, a Liqui-Cel Membrane Contactor is capable of reaching gas saturation in a single step. Under this principle, the N<sub>2</sub> control is reduced to setting-up the incoming N<sub>2</sub> gas pressure equal to the theoretical saturation pressure, eliminating the need for expensive and sophisticated mass flow/electronic controllers. See figure 1.

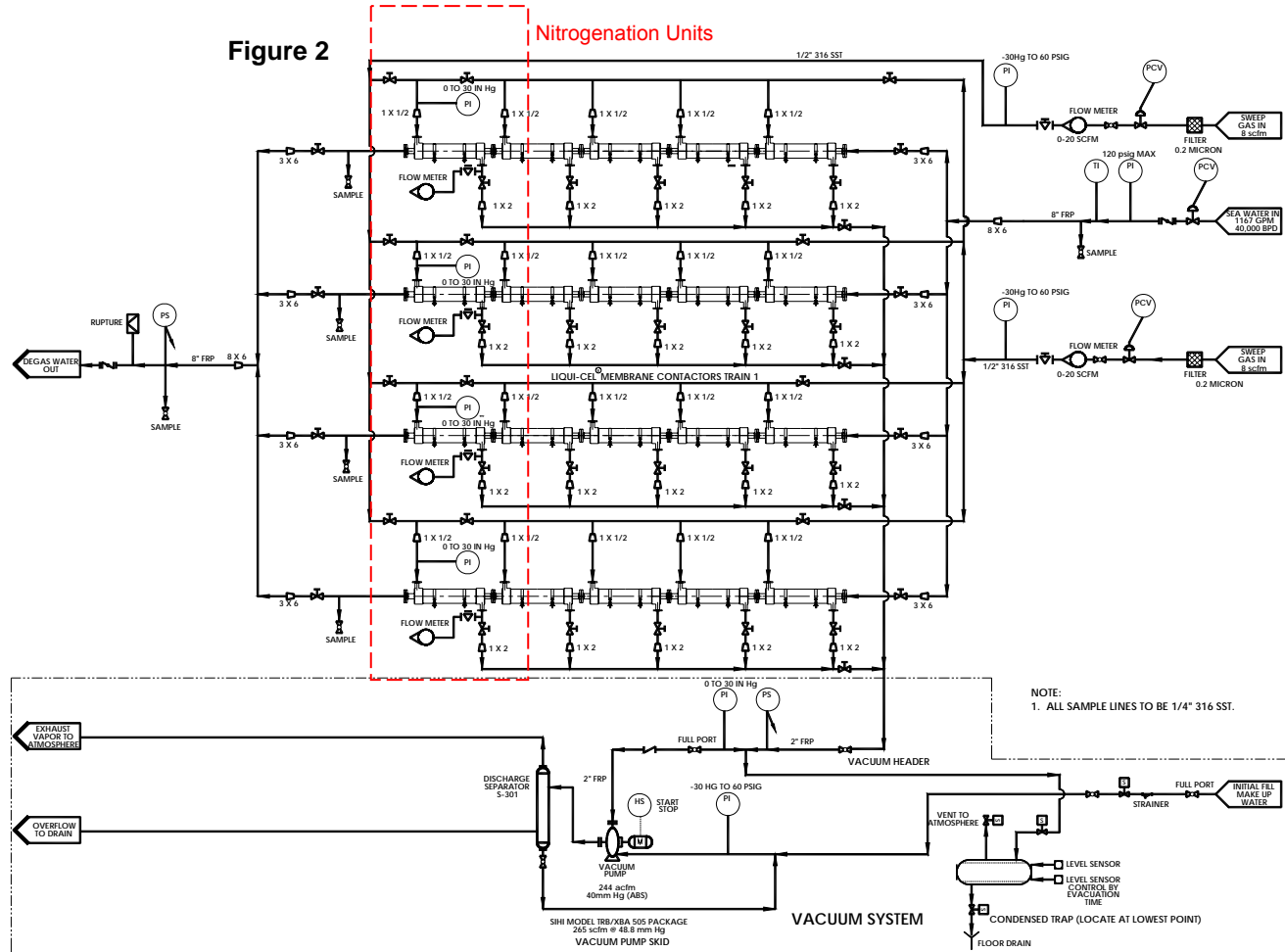


Another possibility is directly controlling N<sub>2</sub> concentration at the polishing loop. Liqui-Cel Membrane Contactors can easily be configured so that the last membrane contactor in series performs a dual oxygen removal and N<sub>2</sub> control. See Figure 2.

to control gas. The ability to control all gases with a Liqui-Cel system offers great advantages to the end user. Additionally Liqui-Cel Membrane Contactor systems are small, modular and expandable.

It is important to point out that traditional vacuum tower technologies cannot be used in this manner

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