



Extending the Process Life of Membrane Systems

Since its founding in 1986, Mass Design Inc. in Nashua, NH, has built and maintained a proud reputation as one of the oldest manufacturers of printed circuit boards (PCB) for critical applications in North America in their 72,000 square foot facility.

The Ask

In 2002, Mass Design invested in a microfiltration membrane wastewater treatment system. Committed to improving the sustainability of wastewater discharge, they were also keen to ensure a longterm return on their investment.

Going a step further, the company also decided at the time to replumb the production area and separate their metal baring and organic production waste streams. Doing this ensured consistent compliance with wastewater discharge requirements while providing owners with peace of mind that their equipment investment would be protected.

Hubbard-Hall's Aquapure Technical Team was contacted to perform a full process audit and identify potential improvements that could be made to further protect Mass Design's investment and minimize any negative impact factors on the system going forward.

Proud of their consistent ability to ensure compliance with wastewater regulations, Mass Design wanted to maintain their high compliance standards and were unwilling to accept recommendations that might compromise system performance in pursuit of system longevity.

The Audit

Mass Design was running on a set of membrane trains. At the time of Hubbard-Hall's assessment, the system had been running for 4-6 weeks. Its starting flow rate was 32 gals/min in between fouling, acid soak, and cleanings. Discharge levels were well within regulatory requirements.

Hubbard Hall's Aquapure Technical team executed a full upstream production and wastewater treatment process audit with the support of the entire Mass Design production staff.

Together they identified all areas where negative impact factors might effect the membranes during processing.

Full Waste Stream Treatability Study

A complete treatability study on their full waste stream — conducted across all shifts — was also part of our audit, including jar testing and a full chemical comparison.

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Every production process with organic additives or components was reviewed and evaluated.

During a second detailed look, we discovered that a minuscule amount of barely visible foreign material from routine PCB processes was compromising the membrane efficiencies.

The Hubbard-Hall team took the data and the analysis back to their lab and began assessing the situation, all the way from asking if minor tweaks were needed to asking if a new wastewater treatment was needed.

Debrief and Recommendations

Having completed our investigation, Hubbard-Hall's Aquapure Technical Team delivered a full analytical, audit report, and process recommendations to the Mass Design management team.

Based on all the information gathered, a decision was made to adopt an 'offense-minded approach. This new stance was to be implemented across all wet process areas to improve and extend the micro-filtration membrane process.

The new protocol empowered the wastewater treatment operator to make decisions about spent solutions. In being able to do this, the operator now had the ability to adjust dosing rates of all treatment chemicals based on a loose production dump schedule.

Targeted Goals

In addition, Hubbard-Hall's recommended a microfiltration membrane treatment process that extended the life between cleaning cycles by 300%.

Even better, the cost of cleaning expenses and chemical consumption were both reduced.

Today, the membrane system is more efficient than ever, which has made a big difference in terms of operator confidence levels. We met another important goal as well, achieving consistent and expected discharge quality – well below permitted levels – for all treated wastewater being sent back to the local municipality.

A Look-Back

It's been nice to be a part of Mass Design's longstanding commitment to its employees, local community, and the environment. Hubbard-Hall is proud to have helped them fine-tune an investment that is sure to be appreciated for generations to come.

The Customer's View

When Hubbard Hall approached Mass Design about a trial of their wastewater treatment chemistry, Neil Chulada was skeptical.

"Leaving a known supplier for someone new to the game is not easy," says Chulada, Mass Designs' Director of Operations. "The decision was solely based on a potential cost-saving that was too big to ignore."

He says that Hubbard Hall's technical staff proved to be supportive and knowledgeable and stayed with Mass Design until they were comfortable with the new chemistry.

"Cost savings were realized within a few weeks," Chulada says. "The additional benefits in process improvement were noticed shortly afterward. Not only did we save thousands on chemical costs, but our Ultrafiltration system never ran better."

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Mass Design achieved better flow rates and needed fewer cleanings than with prior chemistries.

“The combination of chemistry and value-added technical assistance was a win-win,” Chulada says.

“It decreased our cost as well as improved our performance.”

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