

Case Study

INCREASING LAB VACUUM CHEMICAL RESISTANCE WHILE SAVING ENERGY:

A Case Study on the installation of a VACUU · LAN® Lab Vacuum System at Ajay North America, Part of Ajay-SQM Group.

Introduction:

Ajay North America, part of Ajay-SQM Group, manufactures and supplies high quality iodine derivatives worldwide. They partner with customers to guide the transition of their chemical product from bench scale samples to industrial production. The products find applications in a variety of everyday essentials including iodized salt, batteries, disinfectants, solar panels, livestock feeds, flat-screen TVs, and more.

Ajay's multi-disciplinary lab that combines both research and quality faced significant vacuum challenges from the corrosive nature of the vapors associated with iodine derivatives. The solution Ajay installed to mitigate chemical corrosion and improve overall equipment reliability in their lab facility was a VACUU · LAN Lab Vacuum System.

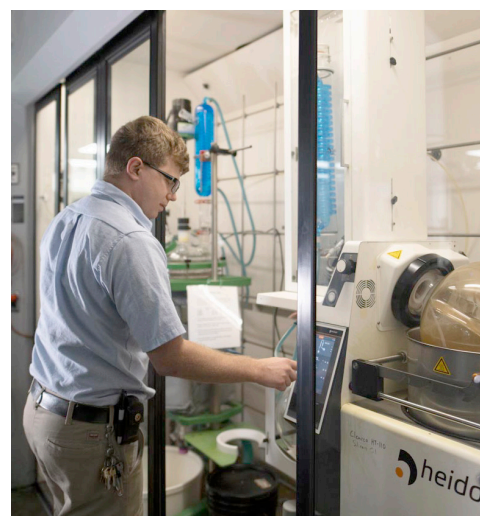
The Ajay lab had been running oil-sealed rotary vane pumps with polypropylene tubing and standard bench valves. The bench fittings were corroding and the pumps were unreliable, needing continuous service and maintenance. The VACUU-LAN system was discovered while researching chemical resistant vacuum fixtures.

Customer Needs and Challenges:

Chemical Corrosion Resistance: Ajay required vacuum equipment capable of withstanding the corrosive vapors present in their laboratory from their work with iodine derivatives. The applications included filtering HCl solutions, rotary evaporation of various solvents including DMF, and vacuum drying ovens.

Reliability: The existing vacuum supply consisted of polypropylene tubing, brass fittings and oil pumps and was plagued by corrosion, constant leaks, pump downtime, and regular oil changes. Ajay required a solution that provided more vacuum stability, less maintenance, and eliminated pump oil.

Cross-contamination Concerns: The multi-functional lab space is used for Quality and Research making eliminating the risk of cross-contamination important. Ajay did not realize there was a vacuum solution that solved this issue with integrated check valves that ensured air-sensitive compounds can be contained appropriately.



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Why a VACUU-LAN Lab Vacuum System:

Chemical Resistance: VACUUBRAND® chemical-resistant pumps, tubing and bench valves with integrated check valves addressed Ajay's concerns about corrosion. The fluoropolymer pathway of the system holds up very well, even against corrosive chemicals such as Ajay's Iodine derivatives.

Customization and Flexibility: The VACUU · LAN Lab Vacuum System for Ajay included a 2-mbar pump (model PC 3012 NT VARIO® select) for deep stable vacuum and the flexibility to run filtration, rotary evaporation, and drying ovens with one pump.

Energy Efficiency: The VACUUBRAND VARIO® chemical diaphragm pump eliminated oil changes and contaminated oil disposal. The on-demand operation and variable speed pump delivered significant energy savings over other systems.

Installation and Performance:

Ease of Installation: The combination of support from the BRANDTECH team in design and installation guidelines, and the ease of installing requiring no special tools were persuasive factors for Ajay in selecting a VACUU · LAN system. To install the initial option of stainless-steel welded piping would have disrupted the lab and taken significant time and budget.

Ryan Martin, Innovation Scientist at Ajay North America performed the installation himself, working in the evenings after the lab had been vacated for the day. This meant there was no disruption or downtime in the lab during the installation process. On his experience with installing the VACUU · LAN system, he reported, "fairly easy to do – a competent maintenance team should be able to handle it." The adaptable and modular format of a VACUU · LAN systems uses PTFE tubing with compressions fittings and specialized bench valves with integrated check valves for vacuum stability to support multiple users.

Reliability and Maintenance: The VACUU · LAN system proved to be reliable, avoiding pump downtime and keeping the lab working while handling all corrosive vapors effectively. The ease of replacing diaphragms added to the maintenance efficiency as well as not having to manage oil changes and waste oil recycling.

Energy and Cost Savings: Ajay experienced significant electricity cost savings with a 76% reduction in power consumption credited to the on-demand operation and VARIO pump technology. The energy savings along with reduced hours in maintenance and downtime were efficiencies for staff and management.



PC 3012 NT VARIO select vacuum pump installed within the lab.

"The pump works really well – handles all corrosive vapors. Should we need to replace the diaphragms, it's easy."

~Ryan Martin, Innovation Scientist at
Ajay North America.



Tubing installed within a fume hood showing the connection fittings.

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Benefits Realized by Ajay:

Electricity Cost Savings: The VACUU · LAN system led to a 76% reduction in electricity cost, making it a financially sensible choice for Ajay North America.

Maintenance Efficiency: Maintenance became hassle-free with the new VACUU · LAN system, allowing the laboratory team to focus on their research without constant pump-related concerns.

Noise Reduction: The quieter operation of the VACUUBRAND VARIO pump enabled its placement inside the lab, creating non-intrusive background noise that is quieter than the fume hoods.

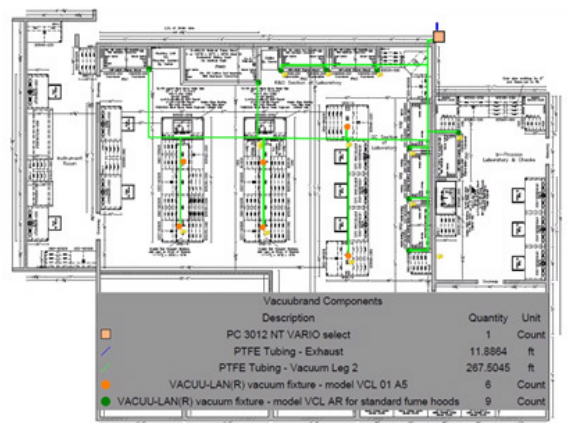
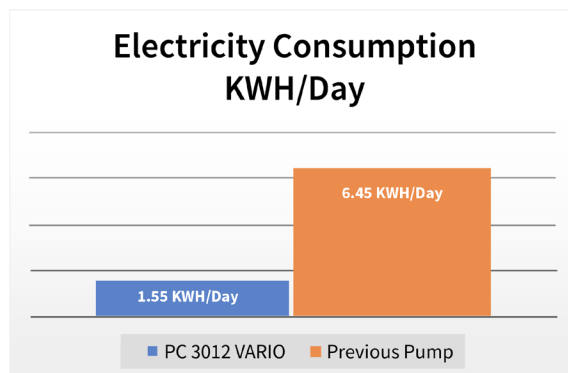
Customer Satisfaction and Service:

Quick Turn-around and Budget Alignment: Ajay appreciated the quick turn-around on the quote and the collaboration to design a system that fit their budget. Ajay worked closely with the VACUU · LAN team to make sure they had all the information needed for a quick, successful installation, including things like drawings and installation documentation. Most importantly, Ajay received quick and accurate answers when questions arose.

Conclusion:

The implementation of the VACUU · LAN Lab Vacuum System at Ajay North America successfully addressed their specific challenges related to chemical resistance. In addition, the VACUU · LAN system exceeded their expectations for a new vacuum system, by mitigating cross-contamination risks, significantly improving energy efficiency, and by providing a solution which is noticeably quieter and is low maintenance. The success of this project underscores the importance of choosing innovative solutions that align with both operational and sustainability goals in a laboratory setting.

Thank you to Ryan Martin from Ajay North America LLC for the input and support in generating this Case Study.



“It would be hard for me to come up with something you guys could improve on.”

~Ryan Martin, Innovation Scientist at
Ajay North America.