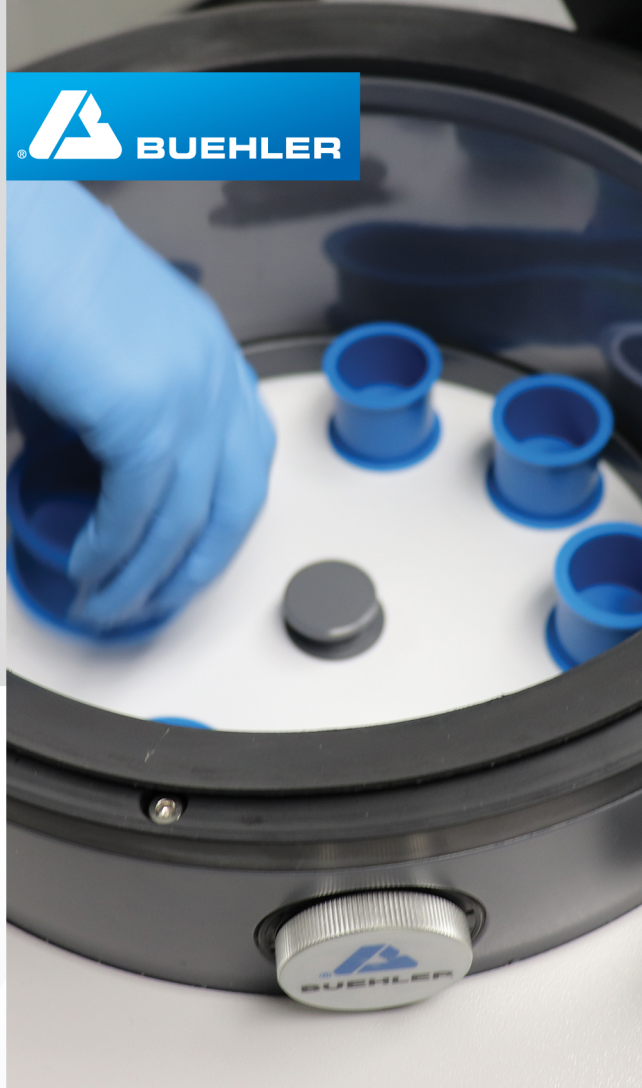


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Save Time and Improve Sample Quality with Vacuum Impregnation

Using epoxy to mount a sample before processing is an effective way to provide additional support to samples during subsequent grinding and polishing and is especially important with delicate and porous samples. However, to get this important internal support, the sample must be penetrated as fully as possible. Vacuum impregnation has been widely recognized as an effective way to improve penetration of the epoxy resin by removing air entrapped in the pores of the sample, enhancing capillary action and reducing the barriers for the epoxy to move into the specimen pores. Pouring epoxy under vacuum is a proven method of reducing this resistance and increasing epoxy penetration.

Though mounting under vacuum inarguably assists with epoxy impregnation, there are some limitations regarding excessive vacuum levels or duration, due to partial pressure changes causing the epoxy to boil. These limitations can prevent the epoxy from fully impregnating the sample and can lead to poor results in the grinding & polishing process. So how do you work around these limitations to further penetrate samples?

SimpliVac™
Introduced
at TMS 2020

THE WORLD COMES HERE
TMS2020
149th Annual Meeting & Exhibition



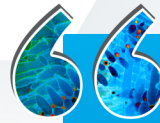
Buehler introduced the SimpliVac at the TMS 2020 exposition at the San Diego Convention Center in California. It was well received by the attendees and they especially liked the SimpliVac's programmability and excellent pore impregnation in a compact format. Quality control lab technicians working on delicate and precise samples in electronics, thermal spray coatings, additive manufacturing and specialty aerospace surface treatments appreciated the ability to optimize sample impregnation in a faster, more automated way.



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Buehler's application engineers have studied this issue and identified a solution: running multiple vacuum cycles with each mount. Multiple vacuum cycles can help extract additional air from the sample and further improve sample impregnation. But how much does cycling help with sample penetration? Turns out, it's a lot! And this difference is substantial, even when the total time under vacuum is the same. Not only does cycling improve epoxy impregnation in samples, but the penetration continues to improve with additional cycles!

However, vacuum cycling has largely been a manual process even with the most sophisticated and "programmable" equipment on the market; requiring user intervention between each vacuum cycle before moving on to the next, resulting in extra technician time to process samples. Until now! Buehler has developed the only fully programmable unit for vacuum impregnation that allows cycling with continuous sealing, requiring no user interaction over multiple cycles. With the SimpliVac, users can run up to 10 cycles without touching their unit, freeing up valuable time.



According to **Alicia Burns**, Buehler Product Manager, "Using a compressed air source, this system quickly and efficiently pulls a vacuum to evacuate trapped air from any porous sample, resulting in optimized edge retention and additional support for processing delicate samples. The digital SimpliVac is easy to operate with an intuitive interface that is easy to set for multiple cycles. This greatly increases effectiveness, and as the only machine on the market able to run multiple cycles there is both efficiency and quality improvement. Buehler's innovations continue to lead industry expectations and this one will not disappoint."

With the SimpliVac optimizing your epoxy mounted samples by allowing you to pour under vacuum and program multiple vacuum cycles you will get higher quality samples, faster while reducing user involvement. The only question is, what will you do with that extra time?

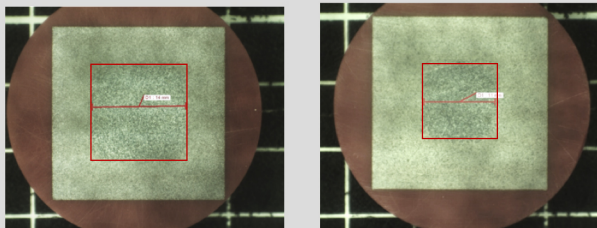


Figure 1: These images highlight the improved impregnation that comes from dispensing the epoxy while under vacuum. The image on the left shows a sample where epoxy was poured first then the vacuum cycle was run. The image on the right shows a sample where the epoxy was dispensed under vacuum. The area that is impregnated with epoxy has improved greatly.

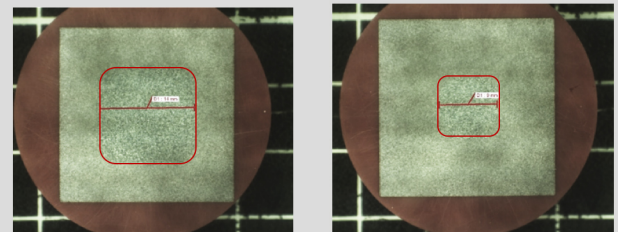


Figure 2: These images highlight the improved impregnation that comes from running multiple vacuum cycles. The image on the left shows a sample that had 1 vacuum cycle for a total of 3 minutes. The image on the right shows a sample that was also under vacuum for 3 minutes but went through 3 consecutive 1 minute cycles. This highlights the improvements that comes from keeping the same total vacuum time but running additional cycles.



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