SolvTrue™
Industrial Solvent Recyclers

Dental Lab Case Study

Solvent Recovery in 3D Dental Manufacturing

How a dental lab reclaimed 97% of its IPA and improved sustainability without sacrificing part-cleaning performance

Precision is everything for dental labs—especially when additive manufacturing is involved. While 3D printing technology has revolutionized the production of custom dental fixtures and replacements, it brings new challenges, particularly when it comes to cleaning parts effectively and sustainably. Cleanliness isn't just a preference—it's a non-negotiable standard for patient-ready components.

When a leading dental lab realized their Isopropyl alcohol (IPA) use was drastically increasing—along with associated costs and waste—they turned to CBG Biotech for a smarter, cleaner solution for their solvent usage.
They needed a system that could reduce waste, improve efficiency, and maintain the high standards required for patient-ready parts.

Their goals were clear:

- Reduce IPA usage and control rising costs
- Improve manufacturing margins through reduced solvent consumption
- Ensure consistently high IPA quality for reliable, effective parts cleaning
- Adopt a more sustainable workflow to reduce waste and improve operational efficiency

Scope: To meet the lab's goals, the test focused on evaluating the SolvTrue™ S700 system's ability to consistently produce clean, IPA with a high-concentration level, suitable for reuse in their resin part cleaning process. The objective was to confirm whether the system could support ongoing production needs while reducing waste and maintaining strict quality standards.

The Process

Solvent: Isopropyl Alcohol 100%, CAS# 67-63-0
Waste: Luticone Digital Print™ 3D Denture Resin, Sprintray Apex Base, Sprintray Apex Teeth

The materials used in this test included the following:

- Used IPA collected from dental lab's waste supply (see figure 1)
- SolvTrue™ S700V, 220V
- Tank Liner, PP7
- Mist Deflector, DF1000

Test Parameters: The sample was processed using CBG Biotech's standard automated operating parameters for IPA and resin-based applications. The jacket temperature offset was set to 30°C, with the underboil offset at 40°C and an underboil delay time of 10 minutes.

A tank liner was used to simplify waste collection after distillation, and a mist deflector was deployed to protect the condenser outlet from potential resin splashing in the event of aggressive boiling.

Findings: The distillation process completed in 5.36 hours, automatically shutting down once the system detected a significant reduction in IPA vapor production. After cooling, the recycler was opened, and the remaining waste was collected for evaluation. The residue appeared mostly cured with minimal IPA content remaining. Approximately 3.94 gallons of usable product were recovered.

Figure 1: waste IPA to be recycled

Distillation results at a glance

- Mixture pre-processing: 27.6 lb.
- Recovered IPA solvent: 25.8 lb.
- Waste remaining in tank: 1.02 lb.
- Recovered IPA yield: (25.8 lb. / 27.6 lb. – 1.02 lb.) x 100 = 97.0 % of net mass
- Rate of recovery: (25.8 lb. / 5.36 hr.) x (1/6.55 lb./gal) = 0.73 gal / hr

Figure 2: waste material post processing

Solvent Recovery Findings

Figure 3: sample of recovered product

Concentration: After distillation, a sample of the recovered IPA was collected and tested to estimate concentration. Tools used included an alcohol hydrometer testing kit along with a scale, pipette, and beaker to confirm specific gravity readings.

As shown in Figure 4, the hydrometer reading was approximately 101%. Applying a standard temperature correction of 3% yielded an estimated IPA concentration of 99%. Figure 5 displays 10 mL of the recovered sample pipetted into a beaker, with a measured specific gravity of 0.779 g/mL. For reference, the accepted specific gravity for 100% IPA at 25°C is 0.781 g/mL.

This places the recovered product within 0.25% of the accepted value, confirming a high level of concentration. Both tests support the conclusion that the IPA remains high-quality and suitable for reuse in production following the distillation process.

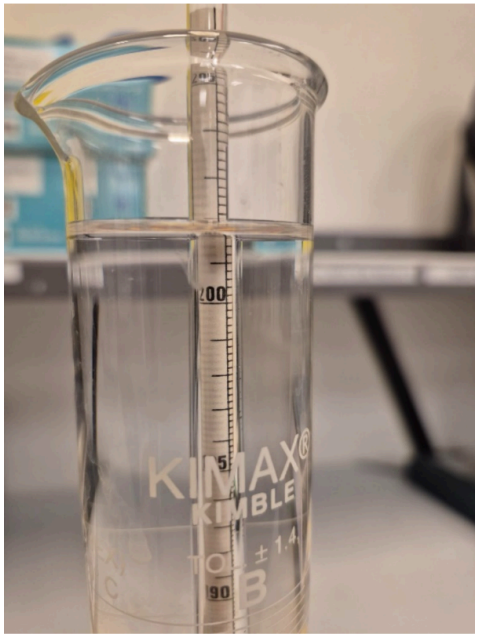

Figure 4: IPA hydrometer test

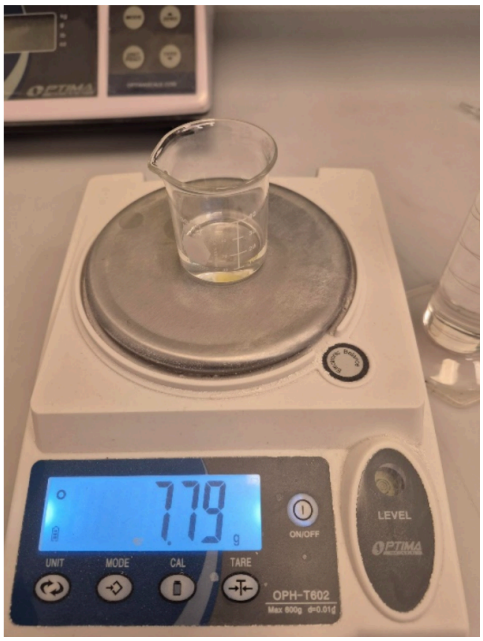

Figure 5: IPA mass, 10mL sample

Conclusion

CBG Biotech provided the recovered IPA sample and test results to the dental lab for review and application testing. The IPA was confirmed to be clean and of high concentration, suitable for reuse in their resin cleaning process. Based on CBG's experience with similar applications, more than 95% of the available IPA was successfully reclaimed.

The test delivered results that aligned with the lab's goals, confirming its success and achieved the following:

- Recovered IPA was clean and suitable for reuse in cleaning applications
- IPA consumption was significantly reduced, helping to control rising costs
- High-concentration solvent supports consistent production quality
- On-site recovery introduced a sustainable, waste-reducing process

The dental lab now has a proven path toward improved solvent efficiency, cost control, and sustainability.

If you have questions about this report or want to explore a solution for your own operation, contact CBG Biotech at info@cbgbiotech.com.

Our team is ready to help assess your solvent usage and identify the right system for your needs.