

CASE STUDY | SEPTEMBER 2026

Conklin Office Furniture Replaces Toxic Adhesive and Reduces Cleaner

Summary

Conklin Office Furniture, a family-owned business in Holyoke, Massachusetts, has supplied sustainable office solutions for over 40 years by refurbishing pre-owned furniture. As part of its commitment to sustainability and worker health and safety, Conklin wanted to find a safer adhesive and adhesive cleaner that would reduce employee exposure to hazardous chemicals used in its production process. Located in an environmental justice community, Conklin recognized that reducing the use of toxins could provide benefits beyond the workplace by helping to minimize potential environmental impacts in the surrounding community. To achieve this, Conklin partnered with the Toxics Use Reduction Institute (TURI) to identify alternatives to a methylene chloride-based adhesive and a toluene-containing cleaner. Because both chemicals pose serious health risks, including cancer, neurotoxicity, and reproductive harm, the company sought technical assistance to evaluate safer, effective options. With TURI's support, Conklin tested alternatives over a period of two years, resulting in successfully transitioning to a water-based adhesive and implementing process changes to reduce the use of the cleaner.

The Process

At their environmental consultant Lynn Rose's urging, Conklin applied for and received a TURI small business grant and worked extensively with TURI and the Massachusetts Office of Technical Assistance and Technology (OTA) in the search for an alternative adhesive and cleaner that would meet the needs of their specific process. TURI evaluated alternatives for toxicity and other potential hazards using TURI's Pollution Prevention Options Analysis System (P2OASys), which allows users to easily compare the relative hazards associated with chemical or process changes. Each of the viable alternatives was thoroughly evaluated to ensure that Conklin would be switching to a less hazardous solution.



Conklin reached out to several vendors and tried multiple adhesives from each, testing more than 20 adhesive products. A similar process was conducted when looking for a cleaner, which was particularly challenging as Conklin's technicians were using one cleaner to remove two different types of adhesives. Conklin tested numerous products recommended by the TURI lab. Simultaneously, the lab tested cleaners and experimented with solvent blends that TURI's researchers specifically curated for Conklin.

Search for an Alternative Adhesive

Among the many products that Conklin remanufactures are open-plan workstations. During this process, privacy screens are refinished using an adhesive spray to attach fabric to a board. The adhesive contained methylene chloride, a chemical known to cause cancer and serious neurological effects. Conklin was concerned about exposure to workers and was determined to remove the adhesive from their process, making their workplace safer. The environmental, health, and safety profiles of alternative products were thoroughly evaluated to rule out potentially regrettable substitutions at the outset. In particular, products containing halogenated solvents such as methylene chloride or trans-dichloroethylene were ruled out before any performance testing was conducted.

The alternative adhesive had to meet two performance-based tests:

1. A "pull test" to ensure the fabric stayed laminated to the substrate.
2. A humidity test to verify that the fabric did not sag in humid air conditions.

The project team worked together to identify safer alternatives that meet Conklin's performance requirements. Conklin tested a list of alternative adhesives at their facility. The table below summarizes key information for the original adhesive and a sample of the alternatives tested.

Original and Alternative Adhesives Tested at Conklin

Product	Primary Constituents	Performance	Cost per Gallon	P2OASys Score
Original Adhesive: Sta'put Original	50% Methylene chloride	Met criteria	\$86	VH
Wilsonart 800	Acetone and distillates	Long dry time	\$50	H
Krylon High Strength	Methyl acetate, propane, butane	Met criteria	\$178	H
Holcim SP80	Methyl acetate & methanol	Failed adhesion	\$70	H
3M24	Methyl acetate, hexane, dimethyl ether, isobutane, propane	Failed adhesion	\$150	H
3M 94	Methyl acetate, dimethyl ether, propane	Failed adhesion	\$91	M
Simalfa 321	Water based; Zinc oxide	Met criteria	\$52	M
Simalfa 980	Water based; polyurethane	Met criteria	\$59	M

Key: L = Low M = Medium H = High VH = Very High

Conklin initially had concerns that water-based adhesives would damage the screens, including causing the fabric dye to run. At the consultant's urging, however, Conklin agreed to try the water-based adhesives. One manufacturer, Simalfa, visited Conklin with the appropriate tools to demonstrate how two water-based products would work for Conklin's process in real time. Simalfa provided on-site training for staff on using the alternative adhesives with new spray guns. Based on these tests and guidance, Conklin chose to switch to one of the water-based adhesives, specifically Simalfa 321.

In addition to the screens, Conklin was also able to use the new adhesive when reupholstering chairs, thereby entirely eliminating use of methylene chloride at its facility. Because the adhesive is water-based, Conklin only needed water to clean its spray guns. In the process of testing the Simalfa products, Conklin determined that it could also use less adhesive overall, providing an additional cost benefit for the change.

Search for an Alternative Cleaner

In a separate process, Conklin manufactures desktops in a process that uses two different types of adhesives, water-based and hot melt. Conklin supplied TURI with samples of the two adhesives and tabletop laminate for use in testing selected alternatives. Conklin also conducted some performance testing in-house.

A particular challenge faced was that Conklin had been using a toluene-based cleaner to remove two different types of adhesives; toluene is a chemical known to cause serious health effects including reproductive hazards and neurological effects. The two adhesives include a Wilsonart water-based adhesive, used for laminate top adhesion, and a Jowat hot melt adhesive, used for edge banding adhesion. In Conklin's facility, the cleaner must be able to dissolve and remove excess of both adhesives without damaging the laminate. The flow of the process results in the excess adhesive spreading and cooling prior to removal, hardening the adhesive and making it difficult to remove. After a board is laminated, cut to shape, and then mechanically edge-banded, Conklin operators manually wipe the board using the toluene-based cleaner to remove residual adhesives.

Trying to find an alternative that cleaned both types of adhesives was especially difficult. After piloting several cleaners that worked on only one adhesive type, Conklin tested mechanical cleaning devices to increase the performance of cleaners that showed promise. However, this added labor hours and extended the process time.

The TURI lab employed the Hansen Solubility Parameters in Practice (HSPiP) test method and software to identify and develop two specialized blends specifically for Conklin's process. These are referred to as Mixture 1 and Mixture 2 in the table below, which summarizes the key information on each alternative and for which adhesive it was tested on. TURI staff went to Conklin's facility to observe the cleaning process and to test the mixtures on a sample of products.

Original and Alternative Cleaners Tested

Product/ Solvent blend	Primary Constituents	Time to removal (minutes)	Adhesive removed	Cost per Gallon	P2OASys Score
Original Cleaner: Startex Lacquer Thinner	Toluene	N/A	Jowat & Wilsonart	\$25	VH
MD Stetson HD-32	Water based; Ethanolamine, Benzyl alcohol	2:00	Wilsonart	\$21	H
MD Stetson EPS	Water based; Ethanolamine, Benzyl alcohol	2:00	Wilsonart	\$25	H
Mixture 1	Acetone and Ethyl acetate	0:45	Jowat	\$20 (acetone), \$71 (ethyl acetate)	M
Mixture 2	Acetone and Thiophene	0:45	Jowat	\$20 (acetone), \$140 (thiophene)	M
Virdivis ICT-1690L	Water based; D-Limonene	10:30	Wilsonart	N/A	M
Windex	Water based; Ammonium hydroxide	0:30	Wilsonart	\$12	M

Conklin originally hoped to replace its cleaner with a single cleaning product that could remove both adhesives. This proved difficult. However, the TURI lab was able to identify and recommend a safer and effective cleaner for each adhesive type. Windex emerged as the best performing and safest option for the removal of the water-based adhesive. It is less hazardous than the other alternatives, less expensive, and easy to procure. For the hot melt adhesive, Mixture 1 performed best.

During the process of testing alternative cleaners, Conklin operators realized they could significantly reduce the overall need for cleaning by reducing the amount of adhesive used, which limited overflow of excess adhesive. In addition, operators began to wipe down boards with water in between process steps so that the adhesive did not set or spread further, making final cleaning much easier. Although they did not eliminate the cleaner, these process changes resulted in a 25% reduction in cleaner use.

Benefits and Outcomes

After two years of testing products, Conklin had success using Simalfa 321 as a water-based adhesive, completely eliminating the use of methylene chloride in their facility. In addition, due to the product being water-based, Conklin no longer uses a paint thinner to clean its adhesive applicator guns. Not only were there reductions in costs associated with switching to the new adhesive, Conklin discovered that it can also be used in the chair reupholstering process.

Conklin also successfully reduced the amount of the toluene-based cleaner needed by implementing process changes to minimize waste. Specifically, Conklin determined that using less adhesive and cleaning between adhesive steps creates less excess waste adhesive.

With the changes Conklin has made, exposure control through personal protective equipment is no longer as critical in the adhesive process. The safer Simalfa product further helped Conklin get ahead of EPA's prohibition on methylene chloride in adhesives, strengthening its position in the supply chain and ensuring the continuity of its operations. Reducing the use of the toluene-based cleaner also helped Conklin reduce its VOC emissions. By eliminating the methylene chloride adhesive and reducing toluene-based cleaner use, Conklin has made major strides in ensuring a safer workplace for employees and a healthier environment for the surrounding environmental justice community.

"By eliminating this hazardous substance, we are taking a crucial step towards ensuring a safe workplace for our employees and a healthier environment for our community. This transition is not only about compliance with regulations; it's about leading the industry towards a more sustainable future. Our commitment to "Greener, better, safer" is a testament to our dedication to quality, safety, and environmental stewardship. We are proud to set an example in the industry and to offer products that are both effective and environmentally responsible."

-Alyson Arnold, Sustainability Coordinator, Conklin Office Furniture



The Toxics Use Reduction Institute (TURI) at UMass Lowell provides the resources and tools to help Massachusetts companies and communities make the Commonwealth a safer place to live and work. Established by the state's Toxics Use Reduction Act of 1989, TURI provides research, training, technical support, laboratory services and grant programs to reduce the use of toxic chemicals while enhancing the economic competitiveness of Massachusetts businesses. Learn more at <http://www.turi.org> or contact info@turi.org, 978-934-3275.