



The Complete Guide to Automating Assembly & Manufacturing with Adhesives

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The History and Evolution of Automation

Automation is nothing new. Industrial inventors of the 18th century were the true pioneers of automation with spinning mills that were powered by water to automate labor intensive tasks. And thus, automation was born to help simplify repetitive processes and procedures. This led to increased production rates while minimizing, and in some cases, nearly eliminating human interaction throughout the process.

Automation has since come a long way.

In today's world, just about anything and everything can be automated. Software is being developed and tested to create autonomous vehicles. Retail and industrial organizations are automating their warehousing. Smart-home devices like Alexa or Google Home can even automate tasks such as turning on your kitchen lights and coffee pot to help you get started with your day.



Fully-autonomous vehicles are being developed to reduce risk, improve traffic conditions, and ultimately improve safety.

Automation has always been a driving force in manufacturing and industrial environments to reduce labor costs and improve efficiency. When organizations consider the possibilities for assembly or manufacturing, there's often three options that are on the table.

1. Manual Assembly or Manual Manufacturing

On one end of the spectrum there's manual manufacturing. Here, stations are often set-up for each stage of assembly. Employees are responsible for a single step in the process and once they complete their task(s), products are passed along either one-by-one or as a batch to the next team and station. Manual assembly is typically slow, inaccurate, and difficult to control from process and quality perspectives. This is most often used for low quantity production runs.

2. Automated Assembly or Automated Manufacturing

On the other end of the spectrum there's automated assembly. Here products and the components that are required for assembly are loaded onto feed systems to enable continuous and automated manufacturing. Throughout the process and depending on the capabilities of the automation system, products can be tested, inspected, and even packaged for shipment. Human interaction during the assembly process is minimized, usually needed to operate the machinery and respond to system prompts. Fully automated assembly is best used for high-quantity production runs and products that require the utmost accuracy during assembly due to compliance or industry regulations.

3. Semi-Automated Assembly or Manufacturing

Semi-automatic assembly is a blend of manual and automated assembly. Some tasks in the assembly process may not be automated due to complexities, business or resource constraints, while other areas rely on automation to reduce manufacturing bottlenecks. A blended approach to assembly often helps organizations make the transition to automated assembly as employees are trained on equipment and new processes while the organization can plan for future innovations. The majority of organizations rely on some form of semi-automated assembly to boost production rates.

Regardless of what stage you're in of your product's life cycle or how you're currently assembling, some level of automation should be considered. This is especially true when working with adhesive components and tapes. We'll next consider why organizations turn to adhesives, some of the assembly challenges they face, how converters solve those challenges and the role automation plays to amplify the effects of assembly solutions.

Adhesive Assembly Challenges and the Converter's Role

Before getting into automation, it's important to understand the role of an adhesive tape converter. Organizations rely on pressure sensitive adhesives to assemble products for a number of reasons. Compared to the alternatives, adhesives can be more economical, better performing, and integrate into assembly processes much easier.

The challenge with adhesives is that there are thousands of materials to choose from, each designed for a specific use, and the materials are often provided by suppliers in large rolls that are too large for use without first being converted into usable sizes, shapes and formats.

That's why it's crucial to partner with an experienced full-service adhesive converter. An experienced converter should guide you through the design and development process to help you select the right adhesive, and understand your assembly and overall product goals to enable you achieve success.

Assembly Challenges When Using Adhesives

With over three decades of experience in helping organizations solve problems using adhesive tapes, Strouse has seen almost all organizations run into similar challenges when it comes to assembly.

During the assembly process, it's often difficult for assemblers to avoid touching the adhesive with their fingers. This leads to decreased adhesive performance. It also becomes problematic when trying to establish an accurate and controlled assembly as well as a repeatable process, negatively impacting production rates.







Other times, when organizations purchase unconverted adhesive they're trying to cut the material by hand or knife. This almost always leads to varied lengths in assembly. Too short and you may not get a strong enough hold or you are losing material performance. Too long and you're wasting material, potentially adding unnecessary weight to your product and creating an unsightly or unpolished appearance in overall product design.

More complex assemblies may require multiple adhesives or different components in a single assembly step. This can be difficult for assemblers to maintain organized workstations and remain efficient in their craft.

The Role Converters Play in Solving Assembly Challenges

A converter's main goal is to help their customer achieve success with their project. That can mean developing a critical component to enable a process, enhancing the performance of a product, improving assembly efficiency, protecting a finished product or surface from scratches, and much more. Converters make this happen by creating innovative solutions that fit seamlessly into existing products and processes.

Some applications require multiple parts. **Kitted solutions** ensure all the parts you need are organized into a single set so that assembly teams can grab a kit and go. **Tabbed parts** and **extended liners** help assembly teams place adhesives and peel off the backing without having to touch the adhesive material. **Color coding parts** can help teams quickly identify the right sized component for the specific product they're assembling. **Perforated liners & tapes** make it easy for assemblers to grab tear off the part they need from a roll of hundreds or thousands of parts. **Individual parts** can also be converted and placed in a box or bag so that teams can grab the piece they need for assembly.

		
Adhesive Component Kits	Tabbed Adhesive Parts	Color Coded/Printed Parts
		
Extended Liners	Perforated Liners & Tapes	Individual Parts/Pieces

Automation as a Force Multiplier

Since the dawn of the industrial age, the driving force behind automation has been the ability to scale manufacturing efforts. While this major benefit is clear, what's not always clear is how automation becomes a force multiplier organization wide. There can be a number of unseen or unplanned benefits that surface once implemented.



Improved Production Rates

Automating manufacturing and processes reduces or eliminates human error and fatigue.

Typically, automation equipment can be operated 24/7 at a fraction of the cost of manual labor.



Mitigate Effects of Labor Shortages

Experienced and knowledgeable staff can be hard to find, especially in rural locations.

Reduce or Eliminate Routine and Manual Tasks

Mundane repeatable assembly tasks and processes can introduce fatigue and temporary lapses.



Improved Safety

Workplace fatigue leads to accidents and injuries on the job. Automation can help prevent this.



Reduced Lead Times

By increasing production rates, you can reduce lead times for internal teams and customers.

Automation can transform teams, products, and entire organizations into profit centers.

Reduced Labor Costs



Improved Quality

Lapses in memory from mundane tasks can increase errors leading to returns and rework.



Avoid the Costs of Not Automating



How to Determine if Automation is Right For Your Project

Square pegs just won't fit into round holes. We've all seen projects where it's been attempted, but rarely does it go off without a hitch.



With decades of experience enabling automation for organizations of all sizes, Strouse and Accuplace have developed a method for determining when automation is a good fit for projects and when semi-automation or manual assembly should be considered. Your success is our success and we make it a point to use square pegs for square holes.

In just about any project, you'll hear the how critical the planning phase is, more on that later. Before the planning phase, our teams need to get a better understanding of the project. Here are some things that we may ask and what typically makes for a good case for automation:

How Many Parts Need to Be Applied?

For applications that require a large number of parts to be placed, these types of projects tend to benefit the most from enabling automation. Applications with fewer parts or components that need to be applied can still be a good fit but these projects tend to be more specialized.

With Your Current Process, Can You Scale?

It's no secret that manual processes are rarely scalable, and when they are you typically need a trained workforce at your disposal. Manual processes are typically a good fit for automation but as you explore automation, it's important to think about the impacts across your entire assembly process. Automating one part of your assembly when other steps can't keep up can create bottlenecks if not properly implemented.

How Important is Placement Accuracy?

Accurately placing parts can be difficult. Accurately placing hundreds or thousands of parts is exponentially more difficult. When accuracy is critical to a project, there's almost no better case for automating. During manual assembly, teams will get fatigued, or lose focus. When lapses like this end up causing defective products, returned products, and rework, the monetary impact on the business can be damaging.

What are your Current Costs?

In manufacturing and assembly, labor can be one of your largest expenses. Because of this, many organizations consider automation so that they can scale their efforts while transferring some labor costs into a fixed operational cost.

As with any project, if the potential ROI doesn't justify the investment, don't jam a square peg into a round hole.

Common Automation Myths

1. Everything about Automation Requires Customization
2. Automation Can Eliminate Entire Labor Forces
3. Automation Equipment Doesn't Require Operator Skills
4. Automation Equipment is Cost Prohibitive
5. Finding an Equipment Vendor Comes First

The Strouse & Accuplace Partnership

Strouse and AccuPlace have worked together for over a decade. The two organizations share the same approach and the partnership aims to help customers consolidate vendor relations by providing a single source for adhesive solutions and manufacturing automation. No longer will customers need to bring together an adhesive converter, an automation equipment vendor, and manage the relationships through the entire process to effectively scale manufacturing efforts.

Strouse's expertise in design and manufacturing coupled with AccuPlace technology introduces a cohesive experience for customers to source adhesive components and automation equipment from the same vendor where all parties are involved in the design and manufacture of solutions from the onset. This synergy streamlines development, eliminates rework and increases speed to market.



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At Strouse, we've always been focused on the goals and success of our customers. In highly technical and highly regulated industries it can be challenging to innovate without investing significant capital and resources. Overcoming that challenge was the idea behind **Sample Express**, our rapid prototyping program. We're now taking that a step further with AccuPlace. In addition to helping customers design and test components to find the perfect fit, we're able to help them cost effectively scale their manufacturing with automation while reducing vendor fatigue.”

Sue Chambers
President & CEO
Strouse



Planning for Success

Achieving automated assembly is no small task. Over the years, Strouse and Accuplace have developed a recipe for success that ensures positive outcomes for customers. This process, much like Strouse's process for manufacturing, is built on a foundation of continuous improvement. With the conclusion of each and every project, our automation process is analyzed and over time it has evolved into what it is today, the industry for industrial automation.

The main ingredient in our recipe for success is simple. Planning. Rarely can success be achieved in anything without having a good plan in place.

Having been a part of thousands of successful adhesive automation projects, here's what you can and should consider before even engaging with your automation partner.

Establish clearly what you are trying to accomplish and what would be an acceptable outcome - also known as acceptance criteria. This should also include what method of inspection will be utilized and at what frequency. An adhesive die-cut automation project's goals work like a lens of a camera. If you set the focus correctly, you will be able to take a clear picture. If it is out of focus, your picture will be blurry. This blurriness ultimately leads to a frustrating experience and result.

Identify "must have" and "like to have" items. This prioritization process helps all stakeholders reach a common understanding of the importance of each deliverable element. Going through the rationale and classifying competing requirements helps the team come together around a specification. It also brings these requirements to the surface, giving the automation vendor a clear understanding of what is vital to the project.

A drawing package with the latest revisions and sample materials. This may sound simplistic but rushing through this stage and proceeding without comprehensive documentation and production representative samples will lead to mistakes, rework, and delays. Don't cut corners here!

Establish a budget. It may seem counter-intuitive to share your available investment. A concern about being taken advantage of with your budget exposed is natural.

In order for your perspective adhesive die-cut automation partner to offer up the right solution, there needs to be an understanding of what your rough monetary constraints are. Be realistic with them and they will be empowered to guide you toward a solution with the right feature set given your financial limitations.



Ensure all supply chain members are aware that this process will be automated. There are multiple methods for an adhesive converter to produce a die cut and manufacturing methods are quite different and lower tech for hand assembly. The expertise of a quality die-cut converting organization can help guide you successfully through the maze of manufacturing techniques, liners, and adhesives to achieve the consistent die-cut rolls necessary to automate film adhesive assembly. The first step to helping them help you is awareness.

Self-analyze your own in-house technical support capability. Automated is not exactly the same as automatic. Complex machines require a support staff with the expertise to help get things back on track when the inevitable machine error or breakdown occurs. Without organizational commitment to have the right team with the right expertise in place your automation investment will never reach its potential payback.

It's important to acknowledge that automation is not the simplest of things to achieve. It will be challenging and frustrating at times. Rarely is automating assembly an easy task, but the long term rewards can be well worth the upfront efforts to make this possible.

Walk, Then Run: Moving from Manual to Semi-Automation

Achieving full-automation for a brand new product or process may not be immediately feasible. In fact, it may not even be the right move from a business perspective. There are often many variables to consider, including costs, raw materials on hand, capacity for inventory, even demand in the market place. Trying to run before you know how to walk can be a costly mistake.

Automating and scaling manufacturing efforts is a balancing act that should be supported by other facets of the business, but when done correctly, scaling manufacturing will help drive your business strategy.

That's where semi-automation comes into play. When organizations first explore automating manufacturing, having some tasks and processes automated can produce an immediate return on investment without having to overhaul existing processes, equipment, or invest heavily upfront.

Here's how Strouse has helped organizations walk before they run with automation.

Roll Goods

For large scale production teams every second counts. Tapes and adhesives, when provided in raw formats can really slow down production, especially when teams have to cut or tear products by hand. Strouse enables semi-automation for organizations by converting large format materials into usable parts that are placed on a liner and wound on a roll. This makes assembly and placement a much smoother process.

Tabbed Parts

Each adhesive application is unique, but sometimes rolled goods aren't enough to automate processes. Some materials are inherently thin or difficult to work with, the adhesive may bunch up, fold over on itself, or lose tackiness once touched. Strouse designs and converts materials to include tabs so that peeling the adhesive component from its liner and placing it onto the intended application is a much more fluid process. This makes jobs easier for assembly teams leading to improved production. In the same way that tabs improve human production, they can also help robotic machines more efficiently pick and place adhesive parts.

Color Coded Parts

In automotive manufacturing, there are often vehicle parts for the same make but varying model sizes appearing on the assembly line. Strouse has color coded components making it easier for assembly teams to recognize which die cut part is needed for a specific size.



Kits

When assemblers have multiple areas to apply converted parts in such a repetitive process it can be easy to overlook or omit a critical component. Kits help assemblers ensure that they've placed all the necessary parts in a sequence before moving onto the next task. Multiple parts in a kit can be placed on a single sheet of liner, wound on a roll, or supplied as individual pieces.

Sequenced Parts on a Roll

This unique converting format is great for assembly teams that need to work multiple areas on a product or process before moving to the next step. Different size/shape parts can be cut and placed on a roll of liner in a custom sequence that makes assembly easy for you team. You pick and place one part from a roll, and the next part on that same roll is the next part you need in your process. Automation doesn't get much easier than that.

Achieving semi-automation comes in many shapes and sizes, but it's often the first critical step towards full-on automation.

How to Get Started Today

It's one thing to source an adhesive material or a component that solves a functional need. This enables you to solve one challenge associated with your product and move on to the next one.

Strouse and Accuplace work together to help you uncover the best possible outcome for your application.

Whether you've got a complete technical drawing, or a sketch on a napkin, you can get started today by contacting Strouse's engineering team.

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ABC [Yellow Square] [Yellow Lines] [Yellow Square] ~~IMPOSSIBLE~~ [Lightbulb Icon]

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