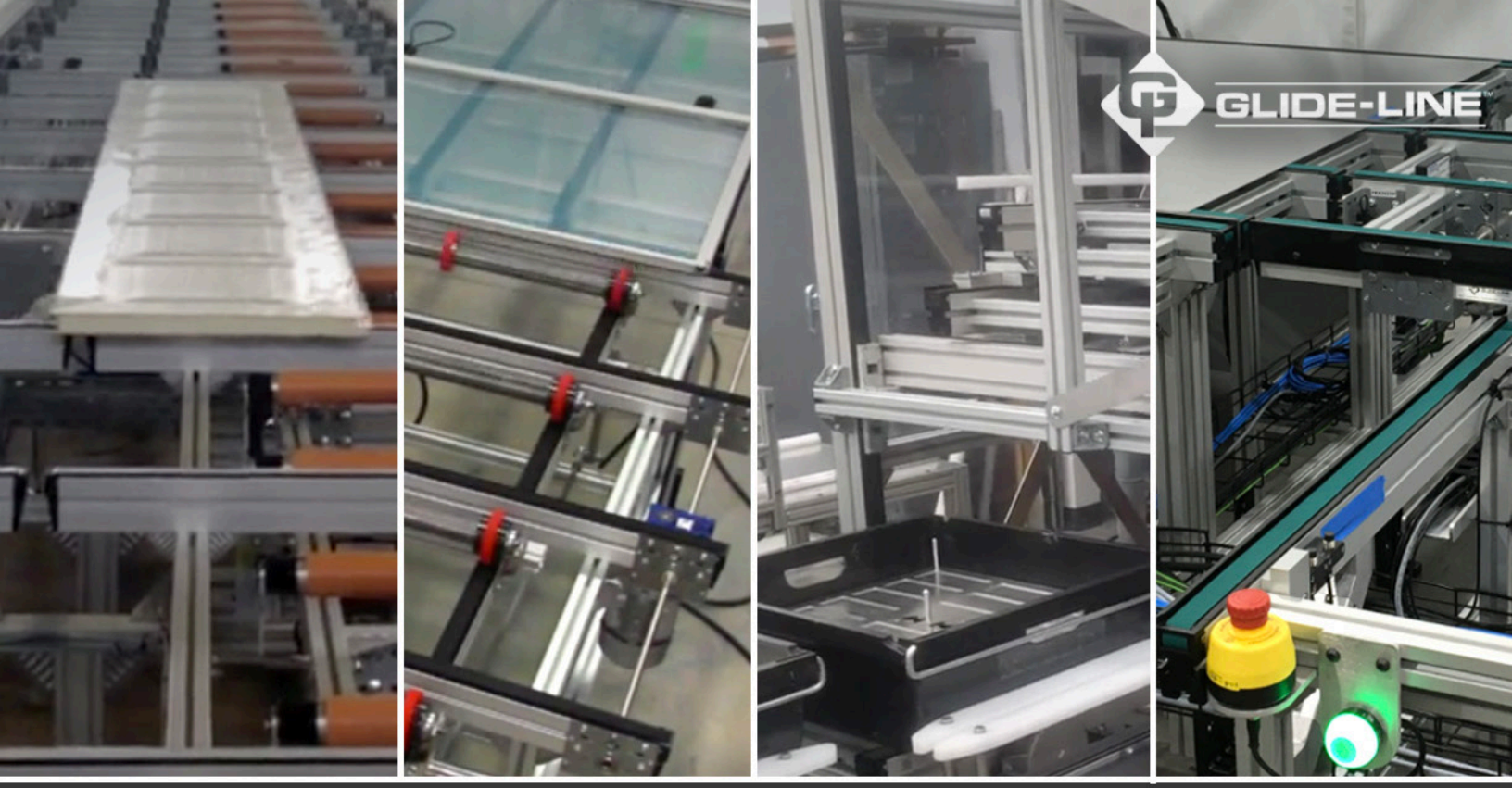


EVALUATING CONVEYOR STYLES & SOLUTIONS FOR WIDE PRODUCT HANDLING CHALLENGES

COMMON APPLICATION EXAMPLES, FACTORS TO CONTROL COST, UNIQUE DESIGN CONSIDERATIONS & MORE

INTRODUCTION

Engineers who want to automate the movement of large, wide, or uniquely-shaped products know the challenges that traditionally come with this request:

- It can get expensive
- Configurability is near non-existent
- Product manipulation is very limited, if possible at all
- Synchronization between conveyors and devices is often an issue

It seems that taking the product from point A to B in a straight line is an easy solution to find, but when your client needs something different, you run into problems almost immediately. Options you may have explored include drag chain, CDLR (chain-driven live rollers), flat belt designs, or any combination thereof.

You're then stuck working around one of these limited options for product manipulation. This unsavory solution that is associated with belts are tracking issues, oversized drives (since you're not only driving the product but also these monsterous, heavy conveyor belts or rollers), and to add insult to injury, it's extremely costly. The problem is that when you get wide, you get expensive.

Thankfully, **there's a better way** - and it solves all the challenges above, including cost concerns. In this ebook, we'll walk you through our solutions for specific applications that are uniquely-shaped, "prohibitively" large and wide (according to our competitors), and that often pose problems for automation because they require gentle handling. Let's dive in!

WHY OUR SOLUTIONS WORK

Glide-Line is different. We use a multi-strand conveyor for direct product handling, and can host a multitude of devices to make each conveyor manipulate the product and configure the line exactly as you need it. By using multiple, relatively thin strands of conveyors spaced out, we can accomplish extremely wide conveyors but keep the cost down, and create room to suit product manipulation or orientation devices.

We are the leader in flexible, highly-configurable conveyors and devices - and we're not scared of automating for large, wide, uniquely-shaped direct product handling. Product manipulation is something we can do that others cannot. We can:

- Convey products at 90 degrees - or any other angle you need
- Add rotation tables simply
- Lift and rotate products
- Manipulate products around obstructions in the plant
- Add buffer zones that conserve space
- Prevent product damage through individually-controlled movement zones

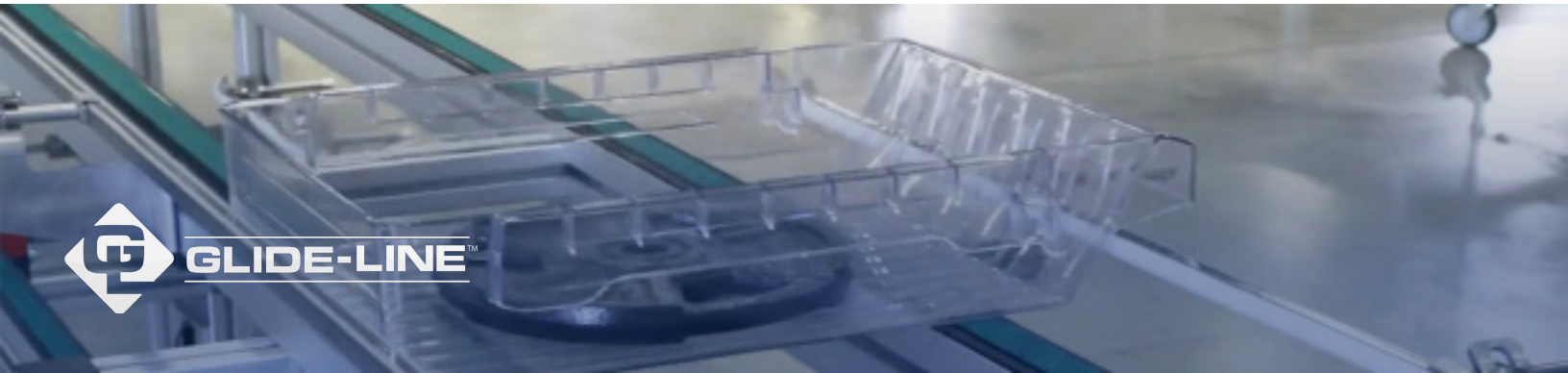
And that's just the beginning.

Glide-Line offers the most versatile multi-strand direct product handling solutions available for the assembly automation industry. We developed our line because there just wasn't an option for flexible, configurable conveyors in the market.

We're not talking about very heavy pallets with products on them; we're specifically addressing direct product handling when you need extra wide, precise control, limited or zero product-to-product contact, and gentle handling that won't mar the product. We'd love to tell you more about how we solve specific challenges for a whole host of applications, including:

- Plate glass, including photovoltaic panels
- Aerospace fabrications
- Appliances and other fabricated metals
- Fine furniture
- Home building products
- Car exteriors
- Industrial wire spools

Read on for how we've applied our direct product handling conveyor and device solutions to these applications.



CASE STUDIES: SOLVING AUTOMATION CONCERNS FOR THESE UNIQUE APPLICATIONS

PLATE GLASS: FRAGILE, WIDE PANELS OF VARYING SIZES REQUIRING TURNS & POSITIONING

Plate glass -- such as large windows, TV screens, and photovoltaic solar panels -- is fragile and needs to be handled with extreme care to avoid scratching and breakage. Handling the plates to ensure they're supported and protected throughout the automation process is most important.

We designed a system for our client that required full support for glass panels (solar panels) of varying sizes that required multiple turns throughout the assembly process. We used a number of solutions working together in synchronization to support our client's needs.

First, we used the five Multi-Strand Transport Conveyor units as the base. It has the ability to move small 16"x16" panels and large 5'x5' panels - and everything in-between. These belts are made for positive drive and precision positioning ability.

Next, the Roller Lift Transfer Unit was used to lift the thin panels off the conveyor and onto another line carefully.

This unit could handle the client's differently-sized solar panels on multiple strands since it's built specifically to avoid damaging delicate products. It was also multi-directional, so could take the product around 90-degree turns easily without adding costs for overhead or manual lifting.

To make it around additional turns within the manufacturing plant, we added in the Drop and Rotate Unit. It replaced pricey complex custom systems the client would otherwise be forced to design for unique turns or using challenging L:W ratios. To avoid damaging the glass panels, it was imperative the glass panels made it around those angles without changing orientation. The device is capable of operating with more than two strands of conveyor, which is ideal for handling large panels. This particular client used multiple center line adjustable conveyors together which, when combined with the DART, enabled the largest panels to be transported through the process without changing orientation, no matter the size.

This solution was a great fit for our client, who avoided manual handling of the large glass products using either multiple employees or overhead cranes with suction, both of which increase the risk of breakage or scratching.

AEROSPACE FABRICATIONS: BULKY PRODUCTS REQUIRING NO-CONTACT HANDLING IN A TIGHT, ESTABLISHED SPACE

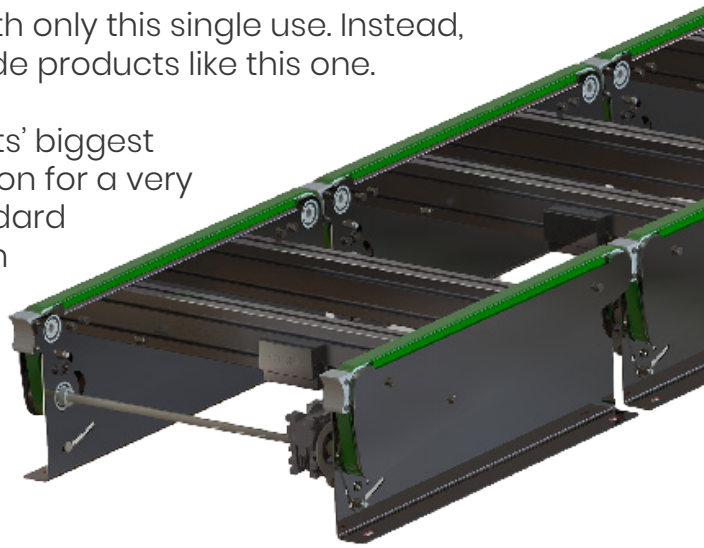
Aerospace fabrications present their own set of unique challenges, whether needing assembly or working toward packaging and installation. We supply systems for aerospace fabrications that can meet these demands. In one recent example, we tackled fabrication for a structural member inside the wing and inside the fuselage. We built a system that incorporated lifts, transfers, vertical transport, and everything else needed for the system that would take it through the assembly process. In the process, we also tackled:

- Product maneuvering through an incredibly tight, established space inside the automation plant
- Gentle handling to avoid product-to-product contact, avoiding damage that would scrap the product
- Unique product shape, size and weight on a direct product handling conveyor and devices

Preventing product damage during the manufacturing process is one way integrators are being asked to impact ROI. We were able to best assist in meeting this demand with our Zero Contact Zoned Conveyor. It uses individually-controlled conveyor sections to eliminate product-to-product contact, control product distance, and efficiently operate each zone only as required. This is achieved using our DC motor/controller set-up or using VFDs with our AC motors. Each individual zone has its own motor, so the ability to transport loads like the aerospace fabrication is uncompromised.

Due to the space constraints, we also built a Vertical Transport Unit elevator that was 14 feet long to convey the product to a different level. Typically, our client would have had to pick the product up with a robot or an overhead crane for an elevation change, a costly tool with only this single use. Instead, we have the transfers and lifts available for wide products like this one.

At 12 feet long and 150 pounds, one of our clients' biggest challenges was providing a conveyance solution for a very long product. This product exceeded any standard pallet size, so a custom direct handling solution was required. Because our whole line of conveyors is configurable, including sizing available in one-millimeter increments, we were able to accommodate this build using our Multi-Strand Conveyors and the devices above with some simple modifications that didn't cost an arm and a leg.



APPLIANCE & AUTOMOBILE EXTERIORS: LARGE, WIDE PRODUCTS REQUIRING A NON-MARRING SURFACE WITH LOW COEFFICIENT OF FRICTION TO ELIMINATE PRODUCT DAMAGE

Appliance exteriors such as dishwasher, washer/dryer, or refrigerator doors pose a particular challenge when it comes to automation. HVAC units can also fall into this category when you consider the consumer-facing nature of these appliances. Consumers expect to get an excellent-looking appliance for their money, and manufacturers need to keep product scrapping incredibly low to keep pricing competitive.

Additionally, automotive doors and other exterior automobile parts fall under the same scrutiny by consumers and can be treated the same way on our lines. This is where Glide-Line can help with the automation process.

In our example, we worked with a customer whose client needed to convey refrigerator doors. Their biggest challenge was scuffing that occurred on the belt as employees would drag the door across the tacky belt surface. The coefficient of friction was high - normally a positive for conveying products when you don't want them to move, but in this case, was causing product damage that needed to be avoided.

We ended up with two types of conveyors in their automation process:

1. **TWIN STRAND CONVEYOR:** We moved them away from a single, flat belt design (big wide belt) and instead we are supplying them with a twin strand system to convey the door panels. Alternatively, this design could incorporate a pallet with a device that holds the door on the belt, eliminating any potential sliding while the conveyor is in motion.

2. **ZERO CONTACT ZONED CONVEYOR:** This solution handled the product directly for a portion of the process. This conveyor is designed specifically to eliminate product-on-product contact. We also molded a belt to add on top of the first belt to give it additional cushion and more "squish."

We have a low coefficient of friction on our belts, which is why ours don't scuff the way they were experiencing with the previous belt. Alternatively, we recommended the optional Roller Lift Transfer Unit to lift the doors from one area of their fabrication process onto the conveyor line carefully, removing the potential for sliding the door across the belts and potentially scuffing the surface.

Where the client had been experiencing approximately a 20% scrap rate, we were able to drop it down to next to nothing on their fridge door panels with our solution. They experienced a significant drop in scrap rate with little to no added cost, all by switching to a better automation solution.

FINE FURNITURE & HOME FINISHES: PRE-FINISHED PRODUCTS REQUIRING A NON-MARRING SURFACE AND BUFFERING SYSTEM

Builders of fine, custom furniture, furniture fabricators, or home building products manufacturers (such as wood floors, cabinets, or baseboard builders) who want to automate parts of their processes are often faced with challenges when it comes to finding the right conveyors to use for their finished products. These wood products may need space to cure prior to being packaged or assembled, and manufacturers certainly can't risk the finish being marred, scratched, or scuffed. Additionally, similar needs from manufacturers of sinks and countertops may find themselves in need of similar solutions to these issues:

We have two options for built-in buffering or curing stations:

1. **RACK FEEDER:** In this example, a Vertical Transport Unit feeds products to a rack of independently driven conveyors. This option allows for the maximum amount of products to be stored in any footprint; we can make the rack feeder as large or as small as needed. Each independently-driven stacked conveyor allows for quick storage and retrieval processes to decrease cycle time, and the servo-driven elevator allows precision movement and stoppage to multiple positions.

2. **ADD CURING STATIONS ON THE CONVEYORS THEMSELVES:** Using Multi-Strand Conveyors, we can build in a buffering system for any of these products to cure and dry directly on the line without removing them. We're able to manipulate the products so they're curing in individual zones prior to moving to the next stage in the automation process. Depending on the space constraints in the plant itself, this can be a great option if the products are too tall for a rack feeder.

As the curing process completes, our direct product handling conveyors - in particular, the Multi-Strand Conveyor - is a non-marring conveyor belt that can simply and easily integrate with the buffering solutions above to complete the automation processes needed for these products.

FABRICATED METALS: FINISHED METAL SHEETS REQUIRING A NON-MARRING SURFACE AND BUFFERING SYSTEM

Sheets of finished copper, aluminum, brass, or bronze require careful handling to avoid any scratching, scuffing, or scraping as they cure and are packaged. Similar to the furniture and wood finishing example above, fabricated metals are handled with care using our buffering solutions. These huge sheets of thin metal are also carefully transported, turned, manipulated and elevated using our solutions for direct product handling:

- **MULTI-STRAND CONVEYOR:** This conveyor solution can be as wide as needed to fully support fabricated metal sheets using a low coefficient of friction directly on the belt to avoid any product damage.
- **CONVEYOR ROTATE UNIT:** This unit simply and easily rotates the entire conveyor around corners with the product situated on top of the conveyor to gently manipulate the product position as needed throughout the manufacturing process or space.
- **DUAL POP-UP TRANSFER:** An alternative to the Conveyor Rotate Unit, this device utilizes two pop-up conveyors to allow particularly wide products to be transferred to another conveyor line while maintaining its orientation. Each pop-up utilizes a single air cylinder, eliminating the need to sync multiple air cylinders, and the non-marking rollers prevent unwanted marks and scuffs on the product.

DOOR FABRICATION: PRE-FINISHED DOORS REQUIRING NON-MARRING SURFACE AND POTENTIAL FILLING

Like other home or exterior finishes, pre-finished doors - including exterior and interior home doors and garage doors - pose unique automation challenges for manufacturers because of their size. In these examples, we walk through how we solved the size challenge for our clients while reducing product damage caused by scuffing.

Insulated Home Door Solution

In this example, our customer's client was insulating stainless steel exterior doors with foam insulation. Part of the fabrication process required them to fill the door with the spray foam. The Multi-Strand Conveyor brings the door shell into a zone. Then we use tilt beds that tilt the door at 45 degrees. The inside of the door panels are filled with foam insulation using a robot. It fills the door from one side and lets the door cure for a short time, then the tilt bed tilts it the other way while a robot fills it from the other side. The gravity from tilting the door helps the foam travel to fill cracks and crevices while the bed gives it a place to cure for a time until it's completed. We were able to solve for two steps in the process while keeping the door protected from scratches using our direct handling conveyor.

Garage Door Panel Solution

We also handled a project for an integrator whose client needed to convey large, industrial garage doors. In this case, the 18-foot garage door panels weren't yet assembled. We had a Multi-Strand Conveyor in place with a strand every four feet to accommodate the width of the panels. These conveyors were driven by common drive shafts to eliminate issues with synchronization.

We also built in special Lift Transfers to help with product manipulation. We went from the wide edge leading to the narrow edge leading and then back to the wide edge leading, maneuvering around interferences.

We worked with our client to configure the system using IMPACT!, our in-context CAD configurator. This tool is free for anyone to download, uses Excel, and works hand-in-hand with SolidWorks so engineers can easily integrate Glide-Line with existing systems during the design and engineering phases.

TIRE AND RIM ASSEMBLY: SPEEDY CONVEYANCE WITH HIGH COEFFICIENT OF FRICTION ON BELTS

When scuffing and gentle handling aren't really an issue, such as with tire and rim assembly, the bigger challenges become product manipulation and configurability of the conveyor belts. Additionally, speed of the conveyor takes a much larger spotlight when considering solutions.

Glide-Line's Multi-Strand Conveyor provides a great solution for tire and rim assembly. The belt can easily be swapped for one with a high coefficient of friction, providing a tackier surface for the assemblies to speedily be conveyed from one point to another.

Devices can be added simply that will enable the products to travel around turns, such as posts in the plant or other machinery, without adding enormous costs to the system.

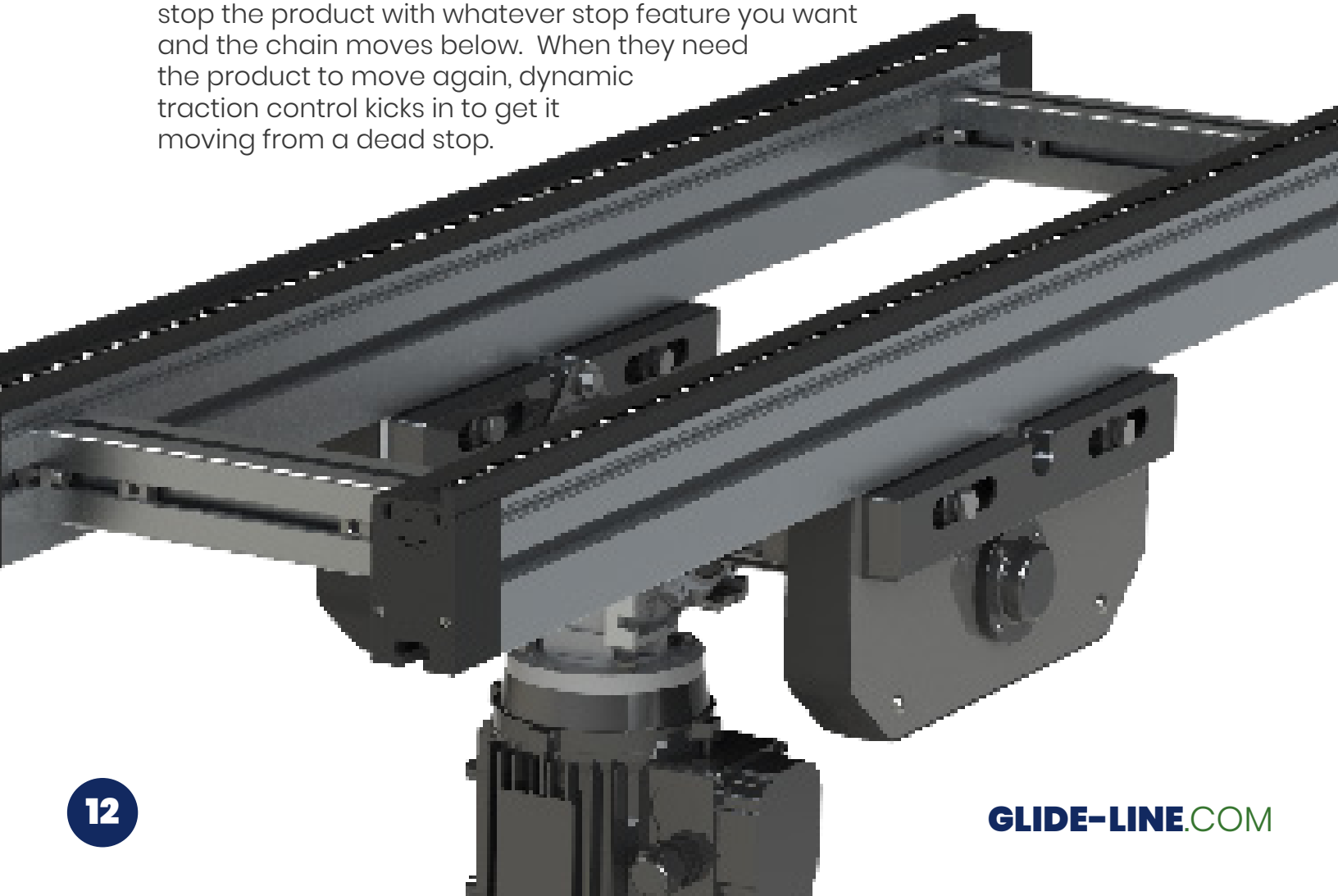
IMPACT!, our in-context CAD configuration tool, once again comes in handy for engineers to use in this instance. Because each of our conveyors can be configured to the exact dimensions needed by clients, and our devices can be added into the designs simply, engineers can get a head start on customizations right off the bat. It's one of the reasons engineers love working with Glide-Line's team so much.

WHEN OUR TIMING BELT SOLUTIONS AREN'T A GOOD FIT

There are some instances where timing belt solutions just aren't a good fit for direct product handling. The two biggest instances where we would suggest considering our roller chain solution is when the product's weight is over 250 pounds, and when space and product contact aren't an issue in the automation process. In those instances, we'd recommend considering roller chain.

Your client won't get the delicate handling that they would from a timing belt when comparing it to a roller chain. However, our roller chain still allows for product configuration and manipulation with the roller chain; they won't get that from other conveyor manufacturers.

Our roller chain also offers dynamic traction control and product control in zones. For example: if your client has a zone to accumulate product, you can stop the product with whatever stop feature you want and the chain moves below. When they need the product to move again, dynamic traction control kicks in to get it moving from a dead stop.



CONCLUSION & NEXT STEPS

Our direct product handling solutions take the place of expensive systems like the overhead gantry system, or traditional conveying systems that encompass rollers and CDLR (chain driven live roller). We can also eliminate or augment manual labor in specific processes, assisting in automating problematic areas of the process.

Solve issues such as:

- Conveyor configurability
- Product manipulation

Our multi-strand conveyor and configurable devices are cost-effective and offer the flexibility and control missing from traditional solutions. Our delivery rates are much, much faster than typical manufacturers as well. Additionally, our solutions can be configured easily using our free tool, the in-context configurator IMPACT!.

Not quite ready to get started yourself? We are able and willing to create a solution that solves your clients' exact problem or need, at little or no extra cost to your client. In fact, that is how many of the products you will see on our site originated - out of necessity to solve our customer's unique project challenges.

Get started today at **Glide-line**.com.