

OPTIMIZE MATERIAL FLOW TO ACHIEVE LEAN MANUFACTURING GOALS



When you're building or retrofitting a manufacturing facility, there's no doubt that streamlining your processes and maximizing efficiency are among your top concerns. After all, waste and inefficiency can cut into sales and profitability. That's why it's important to make sure your material handling systems and processes are in line with these goals. The right material flow system will leverage lean manufacturing elements to maximize productivity and efficiency and, ultimately, your bottom line. This article will explain why it's important to work with a material handling systems and equipment specialist whose modular products embody lean manufacturing principles.

LEAN MANUFACTURING: AN OVERVIEW

To understand how lean manufacturing principles enhance material flow in factories, it's important to explore the concept. Lean manufacturing traces its origin to the Toyota Production System in the 1950s, which was effective in improving operational efficiency and product quality. Lean manufacturing strives to keep production flowing continuously while maximizing a product's value for the customer. It identifies seven sources of waste: transportation, inventory, waiting, overproduction, incorrect tools or processes, movement, scrap and rework. Since then, lean manufacturing has evolved with various approaches to eliminate waste through continuous improvement. Among them:

- **Kanban.** This approach manages workflow and inventory using visual cues that ensure the proper amount of materials are available just before production.
- **Just-in-time (JIT) inventory management.** JIT ensures materials arrive shortly before they are needed, based on customer demand, keeping inventory low and efficiency high.
- **Poka-yoke.** In combination with kanban and JIT, poka-yoke is designed to reduce errors in material handling and transport and, in turn, minimize waste and improve product quality.

In addition, workplaces adopt the Japanese "5S" methodology: sort (*seiri*), set in order (*seiton*), shine (*seiso*), standardize (*seiketsu*) and sustain (*shitsuke*) to create a culture that prioritizes efficiency and waste reduction.

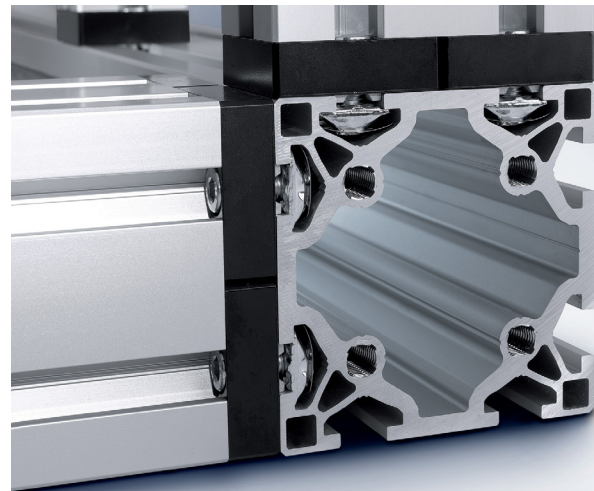
OPTIMIZED MATERIAL FLOW BENEFITS THE ENTIRE PRODUCTION PROCESS

Material flow processes tie together all the elements of the manufacturing facility. Any inefficiencies in the flow of goods and materials on the factory floor can disrupt production, create excess inventory, cause unnecessary handling and drive up costs. When lean manufacturing principles are adopted in material handling systems and equipment, the improvements go beyond logistics and benefit the entire production process. That makes material handling systems a critical consideration when laying out a factory.

Modular material handling systems and equipment have become an essential strategy toward maximizing productivity and efficiency facility-wide. Unlike fixed systems, modular systems are designed with interchangeability and flexibility in mind. They consist

of standardized, multifunctional components that can be built, rebuilt and reconfigured quickly to respond to changing needs such as new workflows, product line adjustments or customer demands.

Standardized components are easy to reuse and set up, giving plant managers the flexibility to scale systems up or down based on product demand. They create application-specific transport systems and production zones that move goods and materials swiftly and efficiently, streamlining processes while eliminating excessive movement of materials from one area to another. These systems also reduce the amount of unique components factory operators need to stock and manage, further saving time and effort. Taken together, modular material handling systems give manufacturers maximum productivity for their investment.



Robotunits' Modular Automation System products are based on an innovative Extrusion and Fastening Technology characterized by a common 14-millimeter T-slot for easy connections.

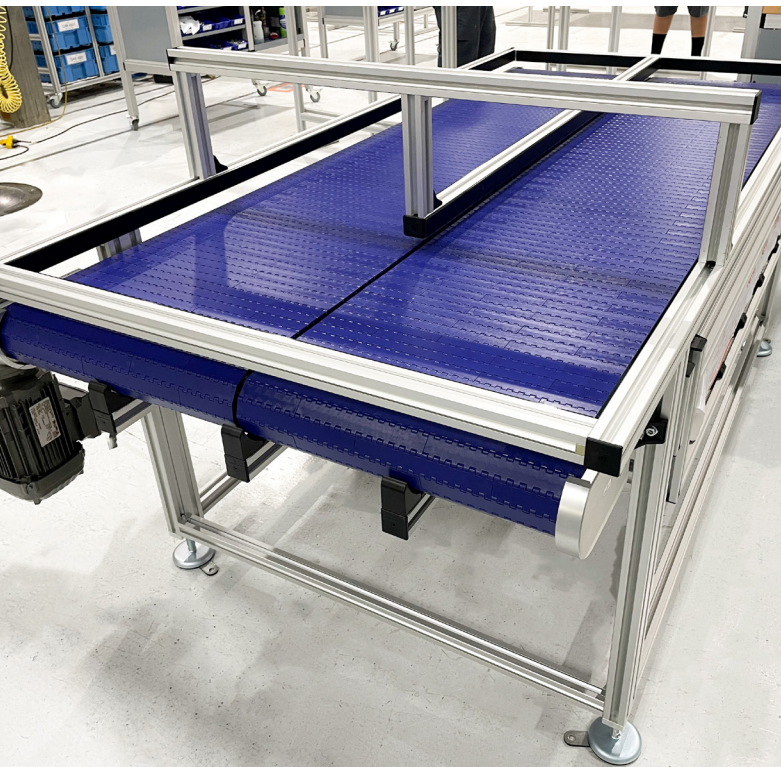
MODULAR AUTOMATION SYSTEMS EMBODY LEAN MANUFACTURING

One such example of how modular material handling systems with standardized, interchangeable components can provide an effective foundation for lean manufacturing in factories is Robotunits' Modular Automation System (MAS). Based on an innovative Extrusion and Fastening Technology, 40- and 50-millimeter aluminum extrusion families can be combined and interchanged thanks to a common 14-millimeter T-slot. This interchangeability makes it easy to connect various multifunctional material handling components such as Conveyors, Linear Motion Units, Safety Fencing, machine frames and guardings and accessories, to name a few.

By standardizing profiles, one part can be used in many ways, forming the basis for unlimited potential expansion options. Plant operators can flexibly build, scale up or reconfigure material flow systems that speed up assembly, reduce inventory and minimize transportation time as well as save labor and maintenance. The result: streamlined processes, improved quality and cost savings made possible through standardized, multifunctional components.

Here are examples of just a few multifunctional Robotunits systems and components that can work in combination to improve workflow and enhance automated manufacturing applications with lean manufacturing principles:

Modular Belt Conveyors. This conveyor system can accommodate a wide range of transport functions. Well-suited for just-in-time demands, these modular belt conveyors combine straight, curved and inclined sections for layout flexibility without pinch areas. Designers can choose their dimensions as well as belt speeds and properties such as accumulation-specific or cut resistance.



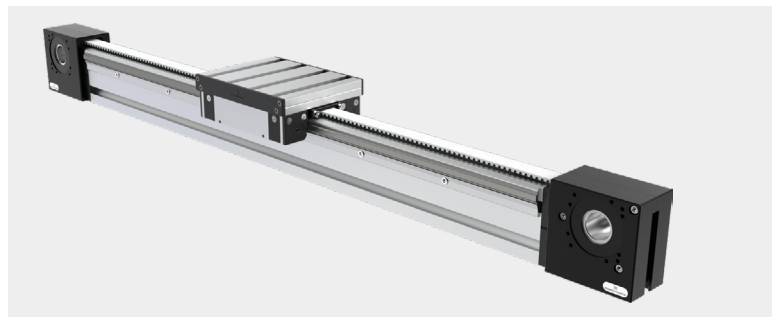
Robotunits' Modular Belt Conveyors can support a wide range of transport functions to handle any workpiece or material.

Powered Roller Conveyors. Consisting of straight and curved powered rollers, lift stations, a 90-degree transfer unit and turntable, powered roller conveyors transport materials efficiently and accurately in all directions. The 24-V plug-and-play 1.9-inch industry standard diameter rollers include an integrated control module inside the extrusion for space savings and protection, and the Poly-V belt includes an integrated safety cover. Powered roller conveyors can be deployed quickly and combine ease-of-use, safety, low profile and cost savings.



Powered Roller Conveyors are well-suited for zero-pressure accumulation conveying in all directions.

Linear Motion Units. This cost-effective axis system with hardened guide rails — available with high-strength single or double carriages, depending on load requirements — includes an integrated belt return and allows the energy chain to be attached directly to the carriage without the need for additional components. Three sides of the extrusion can accommodate additional attachments for design freedom. With the Linear Motion System, the configurations are limitless.



Linear Motion Systems feature a simple, modular design and compatibility with the entire Modular Automation System

Additional Robotunits modular systems and components include Timing Belt Conveyors, Lift Stations, MBS Pickstar Units, Safety Fence, AGV Top Modules and Cobot Station.



A custom configuration of Timing Belt Conveyors and Lift Station.

PARTNER WITH A COMPANY THAT EMBRACES LEAN MANAGEMENT

When it's time to select material handling systems for your manufacturing facility with lean manufacturing in mind, be sure to partner with an equipment specialist who backs up its lean management principles with actions. Companies that embrace lean principles have a clear foundation for developing sustainable and efficient processes and product management concepts. At Robotunits, we exemplify lean management through:

- Well-established strategies and tools for implementing lean management.
- A "5S" work environment.
- Just-in-time, kanban logistics.
- Transparent communications on the shop floor to identify problems or errors and develop solutions.
- Quality management teams to improve processes.
- A commitment to continuous improvement.

By embracing these and other lean management principles, we are able to deliver quality, modular multifunctional automation solutions that save materials, allow easy changeovers and minimize assembly time and costs. The result: optimal value to our manufacturing customers through improved productivity.



Robotunits' Extrusion and Fastening Technology, based on a common 14-millimeter T-slot, makes it easy to create a custom workstation — such as this rolling unit with lightbar — for your lean manufacturing operation.

ENHANCE MANUFACTURING FLEXIBILITY AND MOBILITY WITH COBOTS

Cobots have become indispensable for manufacturers looking to automate repetitive or hazardous tasks. Not only do they perform these tasks faster than humans — alone and with greater precision — cobots are also programmable and can be redeployed when tasks or production runs change. These benefits give manufacturers greater flexibility when configuring work cells and saving installation time. Taken together, cobots effectively reduce waste and maximize efficiency as part of a lean manufacturing operation.

That's why Robotunits offers the Cobot Station based on the Modular Automation System. Unlike humans that incur continuous costs, the Cobot Station provides a simple, low-cost method for installing a collaborative robot with exceptional mobility into a manufacturing area. Depending on the application, the Cobot Station can be customized with toolholders, sensors or probes that attach to the T-slots. And, there's storage space for controllers. The Cobot Station is desirable for assembly, adhesive or simple pick and place applications, to name a few.



MAKE THE MOST OF YOUR MANUFACTURING RESOURCES

When your goal is to maximize manufacturing efficiency, be sure to turn to an automated material handling equipment specialist that employs lean manufacturing methodologies in its own operations. Not only will you significantly reduce waste and optimize productivity, you'll deliver consistently high-quality products that exceed customer expectations while making the most of your manufacturing resources.

To learn more, please visit:
www.robotunits.com

