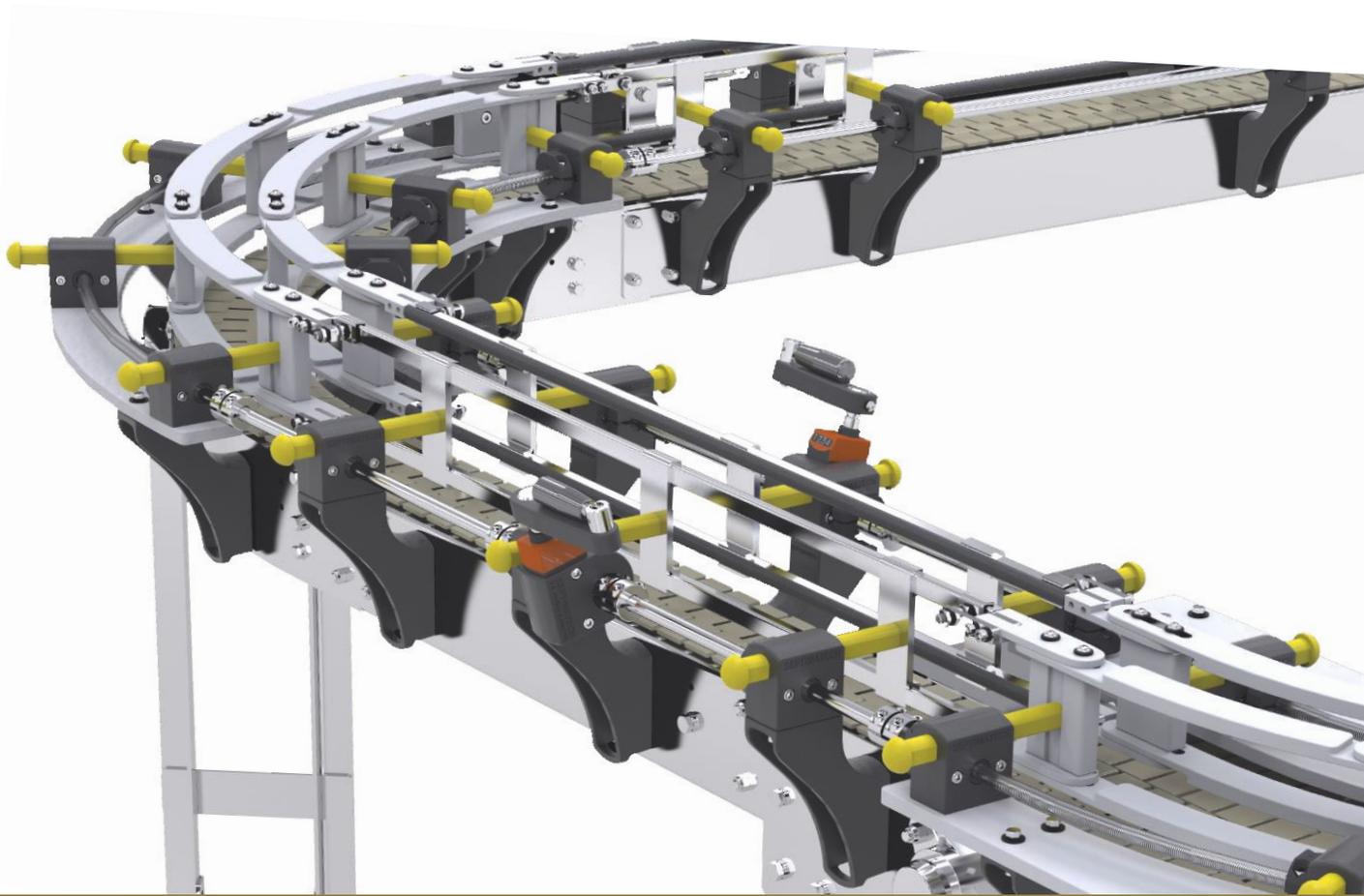


UNLOCKING ADDITIONAL UPTIME



**Leveraging Adjustable Guide Rails to
Improve Changeovers and OEE**

Changeovers—Where Downtime Meets OEE

Finding ways to improve changeover and packaging line efficiency can be a complex exercise. The variety of products produced, container shapes, sizes and materials, line layout, existing processes, and available labor all come into play.

Numerous food and beverage companies report packaging line changeover costs between \$5,000 to \$10,000 per hour.¹ Changeover and lean manufacturing experts believe actual costs could be even higher. Research indicates that only about 20% of companies can estimate True Downtime Costs. Of the 20% that track True Downtime, a significant number underestimate costs by 200% to 300%.² One reason is failure to accurately assess the full impact of how changeovers and maintenance impact availability, performance and quality—the key components of Overall Equipment Effectiveness (OEE).

Many packaging operations spend significant time making additional line adjustments after changeovers. In PMMI's *2018 Beverage Trends Survey*, one respondent highlighted that it can take 3-6 hours to fine-tune their line on top of the 8-10 hours they spend on equipment changeover when they switch containers. That's approximately two shifts where a line is down, performing less efficiently than needed, or producing poor quality product. Models that simply calculate line speed or direct labor expenses vs scheduled downtime do not provide the complete changeover or OEE picture. The additional costs of set up variability, ongoing line adjustments, unscheduled downtime, preventable maintenance, redirected resources, operator errors, response time, stress, and potential business loss can be significant.

A more inclusive lean manufacturing approach to changeover efficiency that focuses on OEE and Total Productive Maintenance (TPM) can make the difference in a bottom line. Manufacturers who look at changeovers the same way they did 5 years ago are increasingly losing money.

Top Changeover Priority Is Reliable, Repeatable Setup

So where do you start? Lean manufacturing experts emphasize the importance of removing variability from changeovers before focusing on speed. Accurate, repeatable setups promote quality and reduce fine-tuning after container switches. The most cost-effective and efficient changeovers improve on all three OEE measures – time a line runs at peak performance; time producing quality product; availability or uptime.

Additionally consistent processes and stable lines increase throughput and reduce unexpected downtime. Outcomes are more predictable and reliable, making them easier to measure and continuously improve. Increased uptime is also a byproduct of reduced variability and easily repeatable setup.

The Changeover, TPM and OEE Connection

Keys to Efficient Changeovers

- Convert as many tasks as possible to ones that can be completed without stopping production.
- Eliminate variables that create inconsistent efficiency and performance.
- Invest in equipment and maintenance that eliminates steps, reduces potential errors, and improves performance.
- Simultaneously changeover components as much as possible.
- Eliminate fine-tuning after start up.

Total Productive Maintenance Goals

- Increase uptime
- Eliminate small stops or slowdowns
- Eliminate defects
- Increase changeover efficiency and flexibility

OEE Measurements

- **Performance Losses**
Running at reduced speed
Minor stops and adjustments
- **Availability Losses**
Unscheduled downtime/repairs
Changeover downtime
- **Quality Losses**
Startup rejects
Running rejects

1. Thomsen Industries

2. [ISA.Org](#) When True Cost of Downtime Is Unknown, Bad Decisions Ensnare, Dave Crumrine and Doug Post.

Adjustable Guide Rails Improve Uptime and OEE

Adjustable guide rail systems deliver fast, reliable set ups that eliminate many human and mechanical variables and fine-tuning. Depending on the type of system, guide rail changeovers can be cut from hours to a few minutes or even seconds. Labor can be reallocated to other production needs. Improved container control reduces downtime caused by shingling, jamming, popping up and tipping. Precise adjustable curves, corners and crossovers prevent traditional bottlenecks, slowdowns and accumulation issues.

Several factors impact the changeover efficiency of adjustable guide rails, including the level of automation, design, type of actuators, and adjustment flexibility. Solutions range from manual, centrally adjustable systems that control long sections of guide rail from a single location to fully automated systems.

The most efficient and cost-effective manually adjusted systems typically have a hand wheel or crank equipped with digital counters that allow precise, repeatable adjustments – either single-sided or dual-sided. Some manual systems can be upgraded to provide multiple vertical and horizontal adjustments that improve handling for custom or difficult to convey containers.



Septimatech Unison® Fully Automated Guide Rail



Septimatech Easy Adjust Rails®



Septimatech Automated System HMI

Fully automated solutions are integrated with existing controls to provide recipe-driven, one-touch changeover. Integration with existing controls and management systems provides valuable data for OEE transparency, traceability and quality control. Changeover time typically is reduced to seconds.

One of the most crucial components on Adjustable Guide Rails is the actuation system. The actuation system controls adjustment, impacts container handling capabilities and helps provide structural integrity to the system. Here are some of the differences between two of the most commonly used systems, mechanical and pneumatic actuators.

| Actuator Characteristic | Mechanical System | Pneumatic System |
|------------------------------|---|--|
| Adjustments/ Settings | <ul style="list-style-type: none"> • Consistent, reliable position across all actuators. • Multiple precise positions for each actuator. • Modular systems provide flexibility to easily adjust to a variety of container handling requirements. • Controlled by digital or mechanical counter set by wheel, crank or automated system. | <ul style="list-style-type: none"> • Repeatable, reliable position depends on consistent air pressure. • Adjustment position typically limited to predetermined points or regulator settings. • Limited flexibility to adjust to different container dimensions. • Controlled by regulators set manually, automated controls, or fixed cylinder positions. |

| | | |
|--|---|---|
| Position Stability/ Resistance to Back Pressure | <ul style="list-style-type: none"> Reliably maintains precise position. Resistant to strong back pressure. Depends on design and quality of components. | <ul style="list-style-type: none"> More susceptible to position instability. More susceptible to strong back pressure. Depends on reliability of pneumatics. |
| Maintenance/Long Term Performance | <ul style="list-style-type: none"> Low maintenance, low wear rack and pinion actuators. More reliable, long lasting performance and wear. Work arounds for damaged or failing actuator. Easier to use and maintain. | <ul style="list-style-type: none"> Higher maintenance springs, seals and air line leakage. Possible performance inconsistency based on life of springs, seals and reliability of pressure. No work around for damaged or failing actuator. More skill needed to use and maintain. |
| Sustainability | <ul style="list-style-type: none"> Low environmental impact and energy use. Sustainable long term performance. | <ul style="list-style-type: none"> High environmental impact and energy use to create compressed air. |
| Total Cost of Ownership | <ul style="list-style-type: none"> No wear parts. Lower maintenance and operation expenses are more cost-effective and efficient over life of equipment. | <ul style="list-style-type: none"> More wear parts, maintenance and operation expense reduce efficiency and cost-effectiveness over life of equipment. |

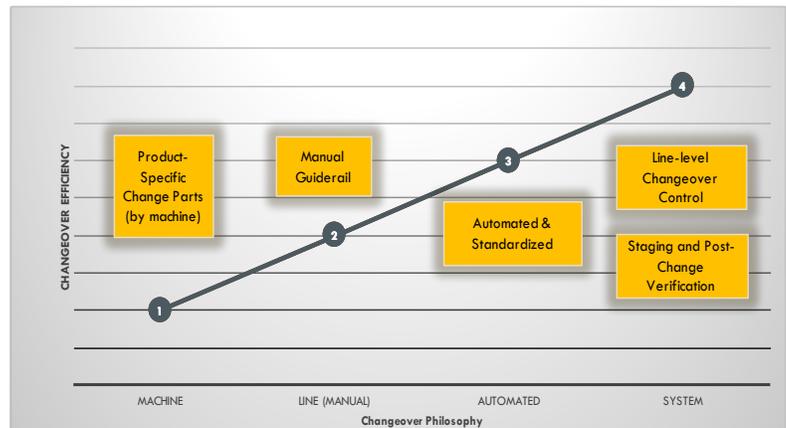
Why You Should Consider Adjustable Guide Rails Now

According to PMMI's *Vision 2025 Report*, one of the biggest challenges facing consumer goods companies is implementing solutions that provide big line efficiency with small line flexibility. Additional challenges include labor shortages and skilled labor availability. To overcome those challenges, end users are looking for intuitive, easy-to-maintain solutions that are modular, multi-functional, and easy-to-changeover.

Technology is making automation more accessible and cost-effective. Programmable controllers are more capable, smaller and less expensive. Networking technology is more reliable and inexpensive. Industry standards such as PackML, make it easier to integrate solutions. Integrated systems and improvements in capturing and evaluating OEE data make it easier to identify the value of changeover solutions that most impact your bottom line.

Cost-effective solutions are now available that help level the competitive landscape for manufacturers looking to invest in lean solutions.

Here are a few considerations to help you choose the right solution for your changeover needs:



Increasing Total Line Changeover Efficiency

| Considerations | Questions to Ask |
|---------------------|--|
| Installation | <ul style="list-style-type: none"> Are brackets and adjusters easy-to-install and add on to existing lines? Are brackets and adjusters robust? What supporting systems need to be installed? Are components reusable as line configurations change? Can in-house labor be used to help manage installation costs? |

| | |
|---|--|
| Production Environment and Line Layout | <ul style="list-style-type: none"> • Is the system scalable and easy-to-reconfigure as needs change? • Are materials wash down capable if needed? • Are sections of your line overhead or hard to access? • What are your container handling requirements? • What is the footprint of components? |
| Ease-of-Use | <ul style="list-style-type: none"> • Is the system easy to understand and use? • How much adjustment and fine-tuning is needed during setup? • Does it meet your adjustment requirements? • How many adjustment points are required? • What is the changeover and setup process and time? |
| Maintenance/Labor | <ul style="list-style-type: none"> • Are components easy-to-maintain and troubleshoot? • What is the mean-time-between-failure of components? • What is required for supporting systems, such as air or electricity? • How much training is needed? • What happens if actuator goes down? • Can repairs be made on-site? |
| Container Requirements | <ul style="list-style-type: none"> • What are material handling requirements for your containers? • How frequently are they changed over? • Is the system flexible to meet needs for future containers? |
| Changeover Frequency and Requirements | <ul style="list-style-type: none"> • How many changeovers do you make? • What are your goals? • How do you expect changeover frequency to change in the future? |
| Total Cost of Ownership | <ul style="list-style-type: none"> • What are upfront, maintenance, energy and operations costs? • What are the expected lifetime of components? |

Septimatech – Proven Performance in Every Packaging Changeover

Septimatech offers a wide-range of adjustable guide rail systems ranging from economic, easy to use, repeatable changeover solutions to specialized container handling and fully automated changeover systems.

For more than 25 years Septimatech has been a leading worldwide provider of packaging machine and line productivity solutions. Many of the world’s leading consumer and industrial goods manufacturers depend on Septimatech to increase uptime, improve performance and flexibility, and overcome unique production challenges.

Septimatech products include Guide Rail Systems, Rapid eXchange No Tool Change Parts, Integrated Line Adjustment Solutions, Feed Screw Drive Units, Feed Screws, Label Handling, and Smart Parts Carts. Septimatech is committed to helping customers maximize their lines’ potential.

Septimatech is headquartered in Waterloo, Ontario.

Installation of Septimatech Guide Rails went very well. Septimatech was able to complete the installation within the 12 hours downtime requested. The install was challenging for such a tight space and small time window but ended in success—zero stops at the new rails during the first 12 hours of runtime. Thanks to all those involved!

— Personal Care Company
