Reusable Packaging for the New Wave of Supply Chain Automation

Understanding automation: the role packaging plays in the adoption of new systems and technologies.

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Now more than ever, companies need their supply chains to be flexible, accurate and nimble to increase productivity and drive efficiency. Speed is king with consumers, as the majority have come to expect products to be in their hands at much quicker speeds than ever before. In fact, according to Shopify's 2022 The Future of Commerce Trend Report, 60% of global consumers expect same-, next-, or two-day delivery. Additionally, there are more new online shoppers than ever before, with 90 million more digital buyers today than in 2020.

And as consumer expectations for speed grow, the shortage of workers is also growing. Warehouse and distribution centers are feeling the squeeze of the tight labor market. While the sector already experiences naturally high turnover rates, intense competition has only exacerbated the issue. And the only way for these companies to keep pace with higher production volumes and a lack of labor is through the adoption of more technology.

Thankfully, technology is expanding and improving dramatically, ready to supercharge supply chains. In fact, investments in supply chain technology are going strong, with the supply chain sector receiving 9.4 billion in total funding in Q1 2022, according to the State of Supply Chain & Logistics Tech Q1 2022 Report. Artificial intelligence technologies are pushing robots to higher levels of sophistication, machines are now picking and packing orders, and IoT connectivity is improving precision and mobility of equipment. These advances in technology, combined with the need to keep pace with consumer demand in a tight labor market, have companies looking to automation as the answer to their challenges. So much so that MarketsandMarkets™ estimates the market for logistics sector automation will reach $88.9 billion by 2026, up from $48.4 billion in 2020.

Solving the Biggest Supply Chain Challenges With Automation

Robotics and automated processes support this lack of labor and higher production volumes. For example, in adopting warehouse automation, companies can overcome the shortage of workers doing repetitive tasks like inventory management, picking and packing, and more. In the same way that automation can address the labor shortage, it also can help companies eliminate human error to improve accuracy, productivity and efficiency, getting products in the hands of consumers more quickly.

But before determining how automation can help your operation, it's important to understand the types of technology available and where they fit within the supply chain.

UNDERSTANDING AUTOMATION

Automation technologies assist the movement of materials and goods to improve overall handling. These systems include, but are not limited to:

PALLETIZERS

A palletizer is a machine that automatically sorts, transfers and stacks cases of products onto a pallet, usually at the end of a manufacturing line.

BOX ERECTING

A machine that automatically forms, folds and seals boxes. This machine removes a whole manual piece of the warehouse, allowing operators to dedicate their time to other aspects of production or fulfillment.

AUTOMATED STORAGE AND RETRIEVAL SYSTEMS (AS/RS)

A form of fulfillment technology, most commonly used in dense storage environments, that includes automated systems and equipment like material-carrying vehicles, tote shuttles and mini-loaders to store and retrieve materials or products.

AUTOMATED GUIDED VEHICLES (AGV)

AGVs are material handling systems or load carriers that travel autonomously through a warehouse, distribution center or manufacturing facility on a fixed path without an onboard operator using magnetic strips, wires or sensors.

UNDERSTANDING AUTOMATION (CONT.)

Automation technologies assist the movement of materials and goods to improve overall handling. These systems include, but are not limited to:

AUTONOMOUS MOBILE ROBOTS (AMR)

More flexible than AGVs, AMRs use GPS systems to create effective routes through a specific warehouse. They use advanced laser guidance systems to detect obstacles, so AMRs can safely navigate dynamic environments with lots of human traffic. They are easy to program with routes and easy to implement quickly.

GOODS-TO-PERSON (GTP)

Goods-to-person order fulfillment combines automated storage and retrieval with accurate, ergonomic and efficient picking processes. Products are automatically transported directly to the associate as needed for picking, reducing travel times and allowing for higher pick rates.

SORTATION SYSTEMS

Sortation is the process of identifying items on a conveyor system and diverting them to a warehouse location using RFID, barcode scanners and sensors. This is used for receiving, picking, packing and shipping.

ROBOTS

Robots transport materials, perform various tasks and streamline/automate processes in warehouse and production facilities. For example, a picking system that includes a robotic arm with sensors can distinguish the shape and structure of an object and grab it.
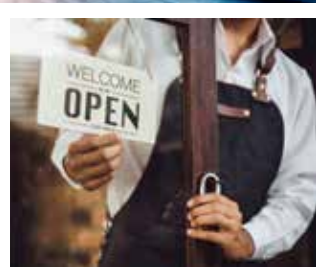
How Automation Supports Your Operation

These automated systems and processes can help streamline your operation at many points in the supply chain and across several applications.

1. Manufacturing and production facilities

The use of equipment and technologies to automate systems and processes can be found across manufacturing and production facilities, utilizing everything from simple conveyors to complex robots.

In the automotive supply chain, automation is used to streamline repetitive processes like welding, material handling and assembling auto body components. For example, in the assembly line, automation can be deployed for riveting, fastening or snapping together parts. With robotics like this and other forms of automation, automotive manufacturers can save time and money, increase capacity, protect employees from dangerous and repetitive labor, and improve quality and repeatability.

2. Warehouse and distribution centers

Warehouse automation varies from relatively simple to quite complex, with all types of automation systems and technologies in play. Basic automation uses machinery and vehicles to increase pick rates per associate. Advanced systems take advantage of artificial intelligence and robotics. For example, retailers need to ensure their products get to the right place, at the right time and in the right quantities. Warehouse and distribution center automation, including conveyors, sortation systems, AS/RS, AGVs and more ensure fast, accurate order fulfillment from de-trashing to product storage, pick and pack and, finally, outbound shipment.

3. Brick-and-mortar retail stores

While new, implementing automation at the brick-and-mortar level helps reshape the way employees work and allows them to focus on other customer-facing tasks. The rise of micro-fulfillment centers is also reshaping supply chains, as everything from sortation systems to conveyors and small-scale AS/RS can now help retailers store and retrieve product and inventory on demand.

In e-commerce operations, we're starting to see more automation being used in the back of stores or attached to stores to keep up with the continued surge of online orders. There's also continued interest in direct-to-consumer grocery shopping, further expanding the opportunities for automation integration at the store level.

Overall, all industries, and at every point in the supply chain, are experiencing growth in the use of automation. Regardless of your application and the technology being used within your operation, reusable packaging solutions are best fit to efficiently transfer, store and organize product loads in automated systems.

Why Reusable Packaging?

There's no denying the synergy between automation and reusables. Long before the boom in the adoption of automated systems, reusable packaging has played a leading role in ensuring seamless handling. According to the Reusable Packaging Association's <u>State of the Industry Report 2020</u>, a majority of respondents (81%) were optimistic that the demand for reusables would increase over the next five years due to the growing automation trend. And the COVID-19 pandemic has only further accelerated the shift to online shopping and automation projects.

> " *Choosing the right container is a critical element in the design of an automated system.* "
>
> **Andrea Nottestad, senior product manager, ORBIS Corporation**

And the key reason as to why reusables are a good fit for automated systems stems from their plastic construction.

BENEFITS OF PLASTIC

Reusable plastic packaging is the ideal solution to meet a wide variety of automated system requirements.

1. Reduce downtime and increase productivity
Dimensional consistency for reliable performance
Given its dimensional consistency, plastic packaging solutions seamlessly interface with a variety of automated systems to drive repeat performance. The standardized nature of reusable pallets and totes allow automated systems to run smoothly, reducing jams and improving the flow of product along the supply chain. These solutions also have no loose boards, flaps or debris that can lead to system downtime.

Hygienic and easy to clean
Unlike fiber corrugated and wood solutions that can harbor contaminants and become compromised due to moisture, the all-plastic construction and smooth design of reusables make them hygienic and easy to clean. Their durability ensures impact and moisture resistance, protecting product from being damaged and allows these solutions to interface well in automated environments to reduce downtime. With plastic, you also avoid the potential for downtime from corrugated dust blocking eye-readers or an out-of-spec/deformed box jamming the system.

2. Save costs while reducing waste
Durability for a long service life
Built to last, reusable plastic packaging is incredibly durable and will last for many cycles through the supply chain, leading to a compelling ROI. While wood pallets and corrugated boxes may seem like the more attractive option due to their upfront price, in the long run, their useful life is much shorter than that of their reusable counterparts.

Sustainable advantages
Plastic solutions are also inherently more sustainable than their single- and limited-use alternatives due to their reusability. They also can be recycled and reprocessed into new packaging solutions at the end of their long service life, without impacting the solid waste stream. They also better protect product from damage, leading to less waste.

3. Meet unique application needs
Diverse material options
Reusable plastic packaging is available in a variety of material options, including FDA-compliant, X-ray compatible and metal detectable to meet the unique needs of each industry, operation and the automated processes it uses.

> *Reusable packaging can be manufactured, used, reused and reprocessed without impacting the solid waste stream, unlike single-use corrugated boxes and limited-use wood pallets.*
>
> **Breanna Herbert, product manager and sustainability lead, ORBIS Corporation**

Precise molding to unique system requirements
With plastic, you're able to mold very specific features to improve handling such as frictional elements and locators for robotic arms. This precise molding allows packaging to meet the specific needs and requirements of unique systems and applications.

Promote safety
With plastic, there are no loose boards or stray nails that can cause worker injury and lead to inefficiencies in an automated environment. There's also no need for box cutters to open or break down corrugated packaging, eliminating another safety hazard. What's more, unlike corrugated, reusable plastic solutions can be interlocked securely when stacked to reduce the risk of falling and include ergonomic features, such as handholds, for easy associate handling.

IoT integration
Plastic packaging is durable enough to be equipped with RFID and other technologies so that customers can track their packaging and its contents automatically, work seamlessly with automated systems, and reduce inefficiency and waste.

Packaging Solutions for Every Supply Chain

As an international leader in reusable packaging, ORBIS® Corporation offers the largest portfolio of reusable packaging in the market that is designed specifically for automated environments.

HANDHELD CONTAINERS

ORBIS' wide selection of containers is the perfect alternative to corrugated boxes or cases to protect your products in transit and improve efficiency throughout the supply chain.

The **Automated Reusable Optimized Solutions (AROS®)** product line is comprised of handheld containers designed to meet the specific system requirements of mini-load and AS/RS systems. This line offers multiple options to meet system integrator requirements and accessory features including dividers and collapsible and nestable options.

PlastiCorr® is a seamless addition to your operation as it is a drop-in replacement for the brown box that is compatible with existing automated packaging equipment with no changes to pack count. Since these boxes last for many cycles through your supply chain, they offer a compelling ROI over corrugated. With **Enfold™** technology, the box's flaps fold and straighten like new every time, allowing it to be used 70-plus times in existing automated packaging lines.

The **FliPak®** and **Stack-N-Nest** containers provide retailers several ready-to-use and proven solutions to support split-case picking. Attached-lid solutions are commonly used from distribution center to the retail store, while **Stack-N-Nest** can support e-commerce operations. These containers offer flexibility throughout the picking process while optimizing storage and transport.

PALLETS

With a variety of footprints and load capacities for light-, medium- and heavy-duty applications, reusable plastic pallets from ORBIS are a durable and impact-resistant solution fit for a variety of automated environments.

Available in all standard footprints and with customizable options, ORBIS offers nestable, stackable and rackable solutions to meet the needs of every supply chain, product or service imaginable.

Adding to their versatility, ORBIS offers a variety of features like steel reinforcements, frictional elements, identification, and multiple deck and bottom options to fit each supply chain's unique needs. Combine with ORBIS reusable plastic totes or **PlastiCorr** for a complete solution.

Rackable
The 40-by-48-inch **Odyssey®** pallet provides stability and unmatched durability with approximately 36 times the life span of a whitewood stringer pallet. The pallet's unique design features, including optional steel reinforcements and molded-in frictional elements, help minimize load shifting and prevent slippage off fork equipment. While designed to support loads of 2,800+ pounds, the **Odyssey** pallet is built to be easily moved, as well as interface seamlessly with automation.

Stackable
The **P3** pallet is designed to improve sustainable handling in primary packaging, food and beverage, and CPG applications. The 40-by-48-inch pallet is a lightweight, stackable, hygienic and durable packaging solution that integrates seamlessly with manual and automatic material handling equipment.

Nestable
The 40-by-48-inch **XpressPal® Economy Duty** is an injection-molded one-piece nestable pallet that offers a strong hygienic design. The pallet's dimensional consistency ensures repeatable performance throughout the supply chain and in automated handling equipment.

BULK CONTAINERS

ORBIS offers multiple stackable and collapsible bulk solutions that are lightweight and durable. With many rigid bulk and sleeve pack options, a variety of footprints, and with features like top caps, access doors and identification options, there's a solution for every unique application need.

Both rigid and collapsible bulk systems include an integrated pallet, unlike carboard boxes that must sit on a pallet with no attachment, for added stability that reduces the risk of shifting and damage through an automated system. Different bottom configurations allow flexibility with industry handling equipment and automation throughout the supply chain. Overall, these solutions help reduce waste and debris from single-use corrugated boxes and are more cost-effective over time than disposables.

BulkPak® rigid containers are available in medium-duty and heavy-duty designs to meet any requirement and a wide variety of application needs. Fixed-wall **BulkPak** containers are extremely rugged and collapsible. **BulkPak** containers are strong and efficient in storage or return freight portions of the supply chain. A full stringer bottom ensures a more stable load during handling and performs better in roller conveyor applications. Bases with foot caps interface more effectively with AGVs and any manual handling equipment. With panels securely connected to the base, collapsible **BulkPak** containers interface seamlessly with end-of-arm robotics during assembly or when collapsing. All **BulkPak** containers are stackable when collapsed or assembled for a secure stack.

The **OpteBulk™** is a pallet, sleeve and top cap system designed to replace single-use fiber corrugated gaylords and wooden pallets while efficiently handling and transporting products in a wide variety of industries.

The system is lightweight and ideal for products that frequently cube a trailer out before weighing it out. The sleeve is available in different styles and sizes to suit any application, and it can also be locked to the pallet base for stability, enabling the system to be used easily in automated dumping applications.

SOLUTIONS AND SERVICES

ORBIS offers multiple materials and a large product line and can provide the best solution specific to your supply chain's needs. ORBIS also offers expertise via on-site consulting, engineering and integration services to ensure a more seamless adoption of your new reusable packaging solutions.

Reusable Packaging Management (RPM)

RPM offers packaging management (sorting, cleaning and repair), and asset management (tracking, demand planning and managed replenishment) services. These services are critical to efficiently retrieve, clean, maintain and track packaging asset inventory. The benefits of using reusable packaging rely on keeping assets maintained and moving through the supply chain while minimizing loss and misuse. ORBIS RPM helps companies have the right packaging, in the right place, at the right time.

Environmental packaging audits

ORBIS experts analyze their customers' systems, design a solution and execute a reusable packaging program for longer-term cost savings and sustainability. Using life-cycle assessments to compare reusable and single-use packaging, ORBIS helps its customers evaluate their CO_2 emissions, water use, landfill contributions and more to reduce their overall environmental impact.

Recycle with ORBIS

The Recycle with ORBIS program buys back obsolete reusable packaging to be recycled and reprocessed into new packaging products, without entering the solid waste stream.

ORBIS® _RPM_
REUSABLE PACKAGING MANAGEMENT

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Sustainable Material Streams

ORBIS offers alternative material streams to increase the amount of recycled content in their packaging:

1. Through its Ocean in Mind program, ORBIS repurposes single-use plastic waste at risk of entering our oceans and major waterways into new packaging solutions for the supply chain.
2. Post-industrial waste is collected when companies look at their own supply chain for opportunities to recycle materials like film, bags, obsolete packaging, etc. ORBIS will then purchase that scrap material and repurpose it into packaging solutions.
3. Post-consumer plastic waste, including items such as plastic water bottles, milk jugs and shampoo bottles, also can be collected, reprocessed and repurposed into new packaging solutions.

The shift to the new wave of logistics automation is inevitable.

It's important to understand the critical intersection between reusable packaging and automated systems to help ensure more seamless adoption. From increased productivity and reduced downtime, to cost savings and waste reduction, it's clear reusable plastic packaging is the right choice for automated systems and operations of all kinds.

Learn how reusable packaging solutions can help bring efficiency and sustainability to your operation by visiting: **www.orbiscorporation.com/aros**.

ABOUT ORBIS CORPORATION

With more than 170 years of material handling expertise and 65 years of plastics innovations, ORBIS helps world-class customers move their product faster, safer and more cost-effectively with reusable totes, pallets, containers, dunnage and racks. Using a proven approach, ORBIS experts analyze customers' systems, design a solution and execute a reusable packaging program for longer-term cost savings and sustainability. Using life-cycle assessments to compare reusable and single-use packaging, ORBIS also helps customers reduce their overall environmental impact. ORBIS is a part of Menasha Corporation, one of the oldest family-owned manufacturers in the United States. As a steward of sustainability, ORBIS is committed to a better world for future generations. Headquartered in Oconomowoc, ORBIS has more than 2,500 employees and 55 locations throughout North America and Europe.

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