



Increasing Productivity and Reducing Costs Through Volume-Reduction Packaging Solutions

Section 1: Today's Distribution Center's Parcel Packaging Challenges

Shipping has never been more challenging than it is today. With exponential increases in e-commerce orders, rising dimensional (DIM) weight charges, and supply-chain labor shortages, shippers need innovative ways to reduce costs. At the same time, increasing productivity and providing exceptional customer experiences is imperative.



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Current Shipping Challenges

Labor Shortages

Some argue that robots threaten millions of jobs, but that's not the case within the supply chain sector. The dwindling supply chain labor force is facing a major skill shortage, and increased competition for warehouse labor combined with an aging workforce means that what was once simply a gap is now a crisis.

Unnecessary DIM Weight Expenses

The average shipped box is 60% air! Because carriers use the dimensional (DIM) weight of parcels instead of the actual weight (when the DIM weight total is higher), large but lightweight parcels incur unnecessarily high shipping costs. To avoid upcharges, shippers must pack orders into the smallest parcel to realize lowest DIM weights and shipping costs.

Poor Customer Experience

Many companies discount packaging as a crucial, final supply chain step. Today, environmentally conscious consumers want right-sized packages. Browse social media channels to witness the outcry of dissatisfied customers who open oversized parcels loaded with air bags, bubble wrap and paper.



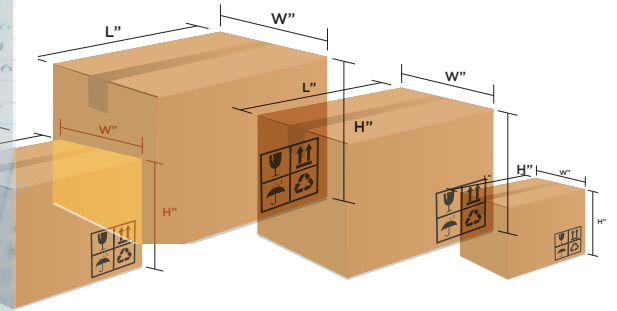
Packaging Solutions

Overcoming these challenges isn't easy, but shippers can reduce labor and parcel sizes while decreasing use of shipping materials. Many e-commerce and third-party logistics (3PL) providers have turned to innovative packaging solutions to address these key issues.

A Complex Problem

While there's extensive data available about the benefits of smarter packaging solutions, it's not as simple as it appears. The packaging function in distribution centers is vitally important, however for many years there have been few productivity gains. Due to continuous e-commerce growth and year-over-year increases in peak-season volume, this area demands attention—and action.

Diving deeper, the main challenges within order packaging are now being investigated by engineering, supply chain and packaging departments. In addition to the labor shortage, DIM weight reduction, and providing a great customer experience, shippers also need to



make sure that they properly train associates to choose the minimal sized box for the order.

In addition to increasing skilled labor shortages, reducing DIM weight and providing great customer experiences, shippers must train associates to choose the smallest box to safely deliver the order.

Multiple packaging solutions have been developed to address these pain points. However, not all of today's solutions address every shipping challenge and many fall short of achieving all desired outcomes. Each packaging solution we will discuss can reduce some or all parcel volume, but do they address labor challenges? Reduce packing materials? Increase customer experiences?

The current packaging solutions that target these pain points fall short of achieving all desired outcomes. Each packaging solution that follows reduces some or all parcel volume, addresses labor challenges, minimizes packing materials and enhances the customer experience.

1 Dimensional
2 Dimensional
3 Dimensional

Comparing Space,
Dimensions and
Volume Reduction

Section 2: Defining the Space

The answer is in how the volume reduction packaging solution reduces parcel volume while tackling other pain points. To categorize these solutions, let's take a closer look at the space and dimensions being reduced in 1D (Dimensional), 2D and 3D volume reduction.

Each solution has benefits as well as pitfalls.

1D (Dimensional) Volume Reduction:

Reduce parcel volume by height

1D volume reduction systems reduce the height of the package. These systems automatically form trays, or open corrugate parcels, in a variety of depths but typically have a fixed length and width.

The Process:

Associates place items inside the parcel as the parcel travels down the conveyor belt. When all items are in place, the 1D solution automatically measures the height of the tallest item, cuts the parcel and folds it down upon itself. A packing slip or invoice is printed and placed into the parcel, and a lid is formed, glued/taped shut. Finally, a shipping label is applied.



BENEFITS

Automation increases warehouse productivity and reduces labor costs
Smaller volume size reduces DIM weight and freight costs
More parcels fit in a trailer, reducing costs and the carbon footprint

PITFALLS

DIM weight and volume reduction is not fully achieved by reducing height alone
Parcel structure does not keep items safe during shipment—some void fill materials are required
Glued parcels are not able to be re-used for customer returns
Provides for a poor unboxing customer experience

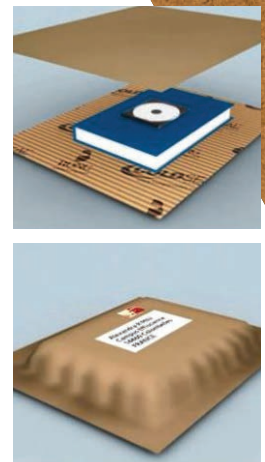
2D Volume Reduction:

Reduce parcel volume by length and height

2D volume reduction systems are excellent packaging solutions for single-line products, such as books, games and CDs as they produce a “sealed-type” corrugate envelope around the item.

The Process:

Corrugated material is measured to the order and cut to length. The system either automatically seals the parcel with glue, or is manually sealed. A label is printed and applied.



BENEFITS

Smaller volume size reduces DIM weight and freight costs
Automation reduces labor costs
Eliminates packaging materials
More parcels fit in a trailer, reducing costs and the carbon footprint
Ideal for single-line, repeatable smaller-sized orders

PITFALLS

DIM weight and volume reduction achieved by only two dimensions—parcel length and height
Material may not be strong enough to eliminate damage
Parcel is not able to be re-used for customer returns
No multi-line order capabilities
Sticky material provides a poor unboxing customer experience
Doesn't fit expansive order size ranges, or adjust for different widths

3D Volume Reduction: Reduces parcel volume by length, width and height

3D Manual Packaging

3D volume reduction solutions optimize parcel volume reduction on every axis.

The Process:

By inputting an item order, a 3D manual packaging solution creates fit-to-size parcels from fan-fold corrugated material. Packaging associates scan items and place corrugate material into the 3D system, which produces a properly sized parcel by cutting and gluing the material to the correct size. Associates assemble the parcel, pack the order and seal the parcel. A label is then applied on the custom-fit parcel.

BENEFITS

Smaller volume size reduces DIM weight and freight costs

Fit-to-size parcels can eliminate void fill and reduce damage during shipping

Environmentally-friendly parcel reduces the amount of corrugate used

Allows customers to re-use parcel for returns

Reduces packaging materials to create a good customer experience

More parcels fit in a trailer, reducing costs and the carbon footprint

PITFALLS

Labor required is consistent compared to manual packaging

Limited productivity gains due to lack of automation

Requires manual box build, fulfillment and sealing



3D Automated Packaging

3D automated packaging solutions streamline and optimize order fulfillment by packaging contents with variable dimensions in custom-fit parcels—within seconds. Labor requirements are reduced dramatically with equipment that does the work of multiple, manual packing stations, boosting productivity.

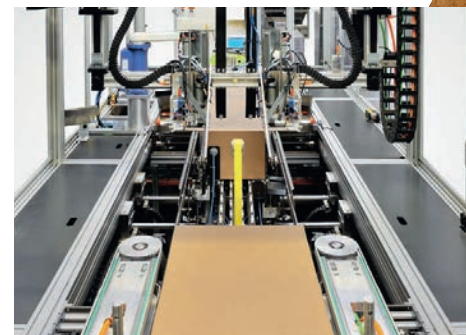
The Process

When an order is picked, the item(s) are placed onto the system where a 3D scanner analyzes the size of the order's contents, and creates the smallest parcel required to the order's length, width and height. It builds, fills, folds, secures and labels each parcel in-line. Some systems utilize pick-and-place robots to add an invoice, marketing material or a packaging slip before the system automatically closes, seals and labels the parcel.

Important Note:

Some 3D automated packaging solutions integrate seamlessly with automated shipping software. These systems rate-shop for the most cost-effective carrier at the required service level and create carrier-compliant labels in real-time.

By creating the smallest parcel needed, 3D automated packaging solutions reduce DIM weight to deliver the lowest possible shipping costs, minimize order packaging labor area while reducing packaging material. It's an environmentally sound and customer-friendly packaging experience.



3D Automated Packaging continued

BENEFITS

- Reduces labor costs
- Fully integrated, continuous packaging automation increases warehouse productivity
- Reduces parcel volume by length, width and height
- Smaller volume reduces DIM weight and freight costs
- Fit-to-size parcels greatly reduce and even eliminate void fill
- Reduces damage during shipping
- Reduces the amount of corrugated material consumed
- Hi-speed solution
- Enables exceptional customer experience
- Some solutions offer the ability to re-use the parcel for returns
- Reduces the carbon footprint
- Reduces box inventory by eliminating the need to store multiple sizes of corrugate boxes
- Can integrate with world-class freight-rating shipping software
- Can automatically print and apply carrier-compliant shipping labels

PITFALLS

- Parcel size ranges can be limiting for some client's requirements
- Not an efficient solution for pick-to-carton operations
- Can be used with a repeatable logo on corrugated material, but some solutions may not place logos in specific location on the parcel

Reduce DIM weight, use less corrugated materials and void fill to create the perfect parcel every time. Add a label inline.

Automated packaging machines scan the order contents and configure a custom box to minimize size every 7 seconds.



ON AVERAGE

88%
SAVINGS
IN PACKAGING
LABOR

32%
DECREASE
IN SHIPPING AND DIM
WEIGHT COSTS

45%
REDUCTION
IN SHIPPING VOLUME,
REDUCES OR
ELIMINATES VOID FILL

29%
LESS
CORRUGATED
MATERIAL USED

Section 3: Comparing Volume Reduction Packaging Solutions

	Manual Pack Stations	1D Automation	2D Manual/Automation	3D Manual	CVP 3D Automation
Increases Productivity	●	●	●	●	●
Reduces Carton Volume	●	●	●	●	●
Reduces Corrugate	●	●	●	●	●
Eliminates/Reduces Void Fill	●	●	●	●	●
Reduces Weight	●	●	●	●	●
Range of Sizes (LxWxH)	●	●	●	●	●
Reduces Packaging Operational Processes	●	●	●	●	●
Re-use Carton for Returns	●	●	●	●	●
Single or Multi-line Orders	●	●	●	●	●
Pick to Shipping Carton	●	●	●	●	●

● = No Go
 ● = So So
 ● = Let's Go!

Section 4: Determining the Right Packaging Solution for You

In comparing 1D, 2D and 3D volume reduction systems, all offer some form of volume savings, but not all packaging solutions satisfy packaging area requirements. 1D and 2D packaging systems offer some savings on corrugated packaging area productivity improvements. 3D manual solutions can offer a good customer experience. When it comes to increasing productivity, reducing parcel size and decreasing corrugate usage, nothing compares to a fully automated 3D packaging solution.

Seamless pairing with shipping software reaps big savings.

3D automated packaging solutions can save shippers over 30% in shipping and DIM weight costs and an average of 29% on corrugated material. On average, shippers reduce dimensional volume 45% and save about 88% in packaging labor.

Looking forward to the best long-term solution.

Business-to-consumer companies should evaluate features, cost savings and efficiency to determine which solution is best for their business needs right now, and more important, where the needs will be in the future.



About ProShip, Inc.

ProShip, Inc., a Neopost company, is a global provider of logistics software and product solutions, including enterprise-wide, multi-carrier shipping and manifesting software, automated packaging solutions and intelligent parcel lockers.

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