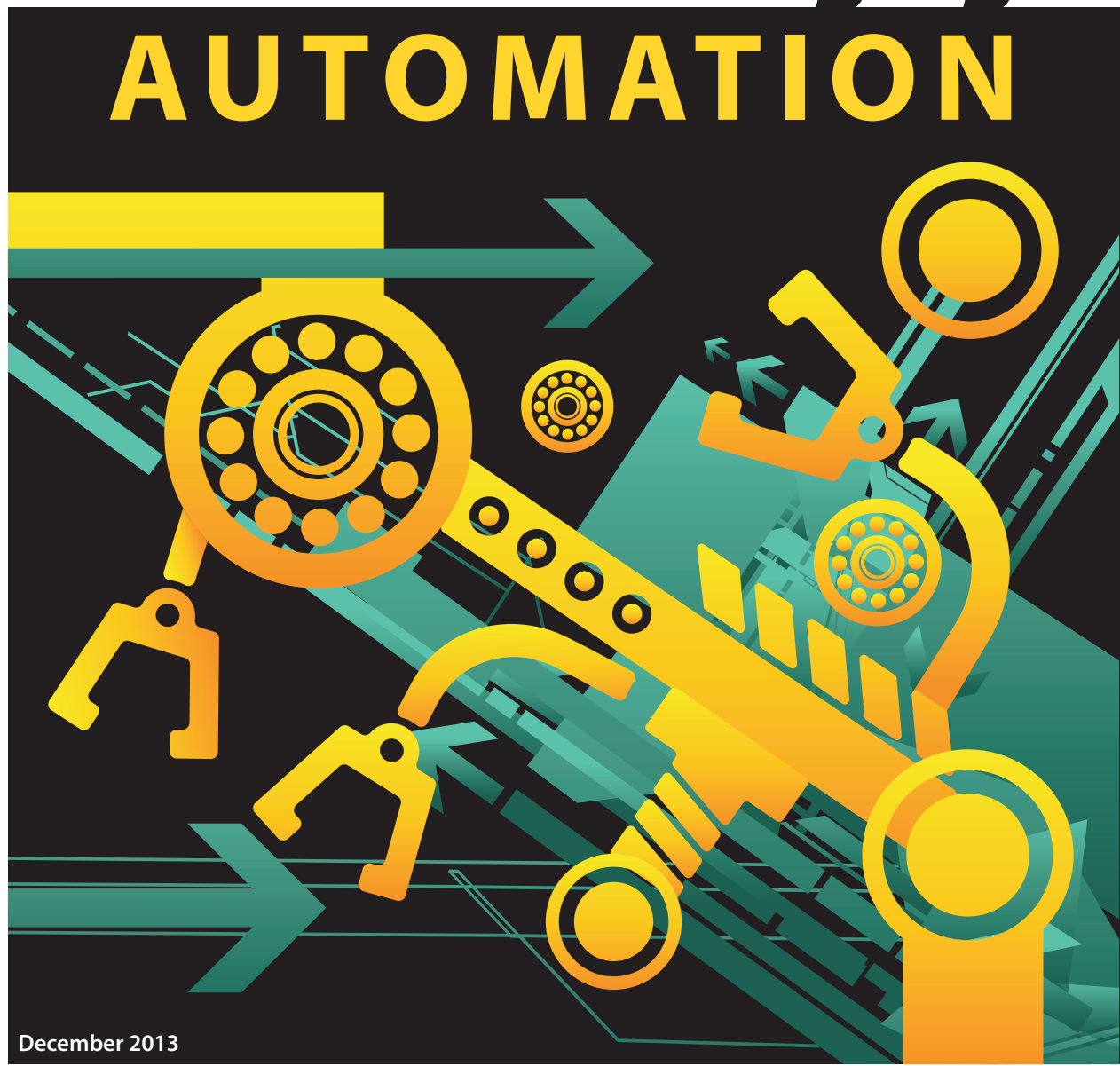


Trends in Packaging AUTOMATION



December 2013

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Assessing packaging’s impact on supply chain performance

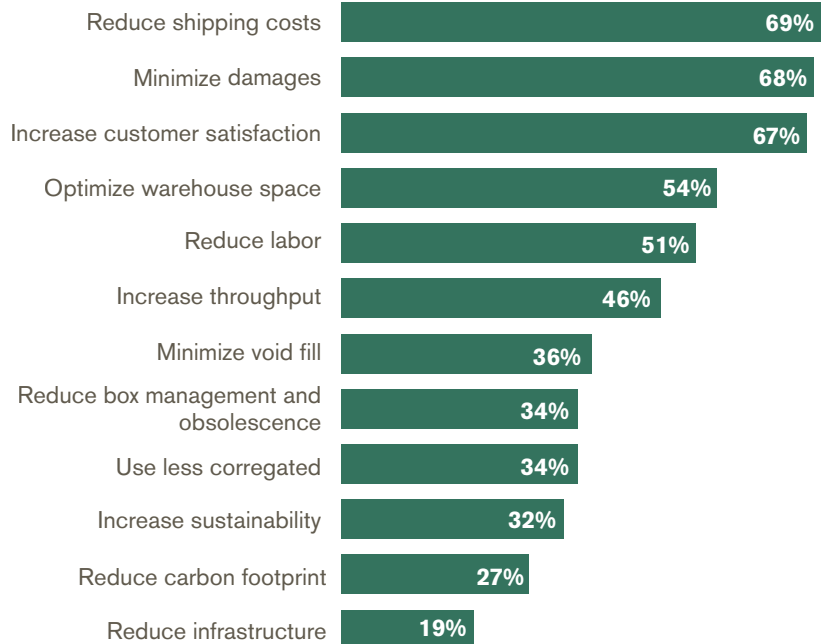
The efficient execution of a supply chain operation begins with packaging. The right-sized package drives a ripple effect on storage, handling, and transportation efficiencies as it travels through every trading partner in the chain. There are several benefits to reducing the average package size, including an increase in the number of cases on a pallet, which leads to a decrease in storage space requirements, fewer pallets to handle, and room for more items in the freight container. With fewer trucks on the road due to a greater emphasis on dimensional sizing, package optimization can reduce shipping costs and make a significant impact on an organization’s sustainability rating.

According to a recent study sponsored by Packsize International and conducted by the Peerless Research Group on behalf of *Modern Materials Handling*, *Logistics Management*, and *Supply Chain Management Review* magazines, most companies acknowledge packaging and packaging operations as significant components of their supply chains. Managers see it as a means to maintain customer service levels, which continue to be many shippers’ highest priority. With proper packaging, damages and returns are reduced, thus ensuring customers’ continued satisfaction.

Reducing shipping costs is another priority. However, it is complicated by the numerous permutations of shipment sizes that cannot be accommodated by the limited number of box or carton sizes available at a facility. Filling material, or dunnage, is then required to fill extra space in these shipments. Larger cartons and additional space become the inefficiencies that the package must carry throughout the supply chain.

As a result, managers continue to seek a resolve to their packaging challenges. We learn in this study key initiatives businesses are taking on specific to their shipping and packaging operations. Reductions in damaged shipments to better serve customers and the need to better optimize floor space are ongoing. Many express the need for a system that is able to create right-sized cartons, on-demand, in pace with production and picking operations while using less corrugated material. Not only must this packaging system be flexible and dynamic, but it must also be cost effective.

Actions and initiatives regarding shipping and packaging operations



To more fully understand business' packaging and shipping needs, we interviewed 322 supply chain and logistics, directors and managers from manufacturing (55%), fulfillment/e-commerce (18%), and other non-manufacturing operations (27%) to examine the state of packaging and to uncover trends in packaging automation. An array of business sizes was represented: 48% are from smaller companies (under \$100 million in annual revenues), 28% are from mid-sized firms (\$100 million - \$999.9 million), and 24% are from larger corporations (\$1 billion or more). Nearly one-half of respondents ship an average of at least than 500 boxes per day, while about 11% of those studied ship as much as 10,000 or more boxes per day.

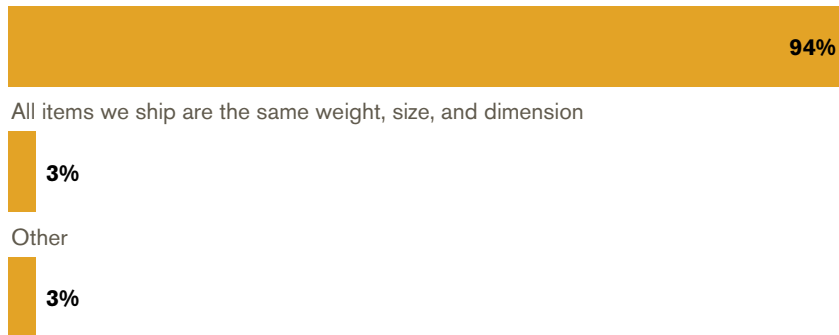
Current state of packaging

The use of corrugated packaging continues to be the preferred method for shipping product, with nearly nine out of 10 reporting corrugated as their packaging material of choice. This trend is expected to continue due to the cost-effectiveness of the corrugated box, but also because of its sustainability. It is made from renewable resources and is 100% recyclable. Operationally, it is lightweight, yet it can be made sturdy enough to protect a broad range of durable and non-durable manufactured goods in storage and in transit.

However, one particular packaging challenge continues to be the different box size requirements that 94% of shippers have. (Only 3% report shipping the same weight and same size boxes.)

Types of boxes needed

We use/need different box sizes



This growing need for different box requirements has been fueled by the proliferation of SKUs and e-commerce. Where distribution centers used to previously process case or pallet quantities of line items, today these same facilities are breaking bulk quantities and processing one to five line items in quantities of one to three eaches. This creates a dramatic shift in the way orders are picked, sorted, packed and shipped. If an order doesn't fit within one of a limited array of boxes, workers use the next larger size, which may have significantly more volume requiring a higher amount of dunnage to fill the empty space in the carton.

"We have a wide variety of order sizes that creates difficulties in cubing our product up front as well as creating a high need for void fill at times. This forces us into having a lot of different box sizes."

—Engineering;
Paper Goods;
\$1B - \$2.5B in revenues

"We are moving toward more customization with our offerings to our customers. This will require a more rapid response. To achieve this it would require a higher level of automation in our kitting department."

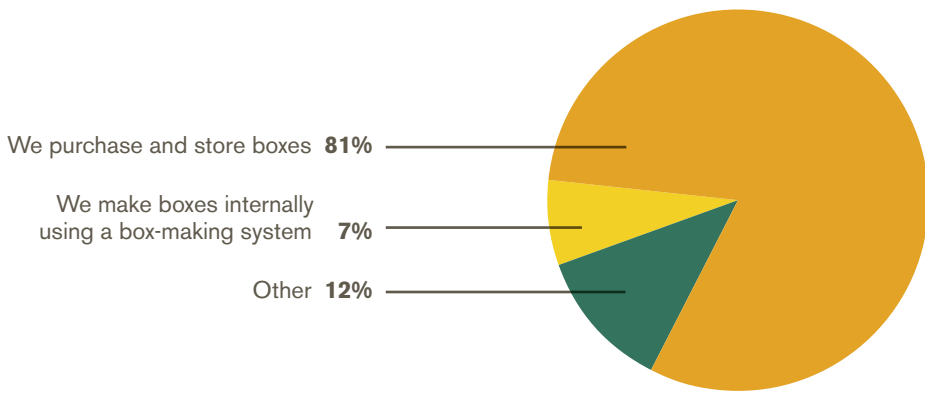
—Vice President;
E-commerce;
\$50M - \$100M

"Our full case orders are shipped directly in vendor boxes—we have purchased equipment to better fit our business needs. Our goal is reduce void-fill and the shipping of air."

—Logistics &
Distribution Manager;
E-commerce;
\$50M - \$100M

While 7% of operations are making their own boxes internally using a box-making system that is mostly a mix of manual and automated systems, only 80% of companies continue to purchase and store their corrugated boxes from vendors and contractors.

Genesis of boxes



While most survey respondents are not expecting any packaging origin changes over the next 12 to 18 months, nearly 10% are planning an upgrade or improvement and are considering other options, including automated on demand box-making systems (that can create the right-sized box when needed) and environmentally friendly returnable containers.

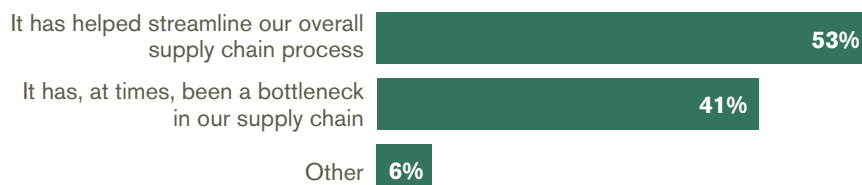
How important is packaging to the supply chain?

Most companies (86%) consider their packaging operations as a component of their supply chains—some of those who don't consider it packaging instead consider it more a part of their manufacturing or assembly process. Where packaging is part of the supply chain, most believe their packaging operation streamlines their supply chain and improves its efficiency. How? A number of respondents point to how the packaging process prepares the product into a form that is efficient and simple to handle and transport while protecting items from damage. With proper labeling during packaging operations, systems are able to direct where a shipment should go and thus ensure that the next leg of the supply chain operation runs smoothly.

Packaging as part of supply chain operations



Overall performance relative to supply chain operations



“We’re looking for flexibility in automation for different box sizes and the ability to flex with ease for average to peak volume changes along with low administrative time during the box making and label printing and attaching processes.”

—Vice President;
E-commerce;
\$2.5B+

“We are considering some form of on-demand packaging to prevent the storage of cartons. We can put the space to better use.”

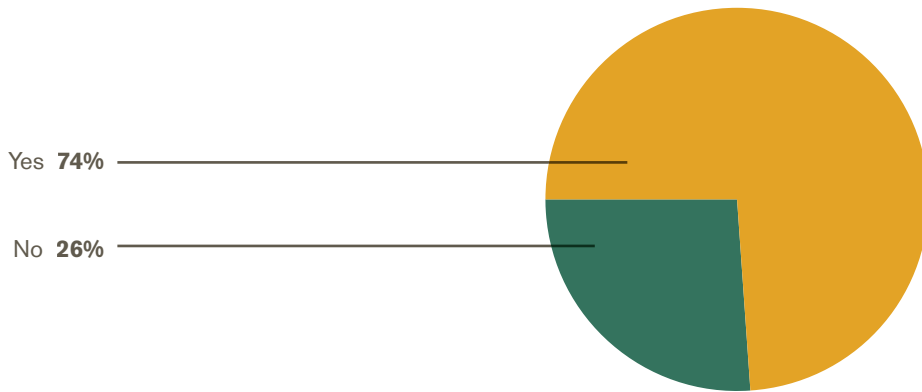
—Engineering Management;
Manufacturing;
\$50M-\$100M

“We are able to consolidate multiple orders from one customer into as few boxes as possible.” This saves on time and shipping costs.”

—Corporate Management;
E-commerce;
\$250M-\$500M

In fact, most managers recognize the importance of packaging in their supply chains—with 74% of them regularly gauging how packaging impacts their operations. Those 26% who don't assess it state that “it's just not a priority” (typically they have bigger problems to tackle) or they “have simply no perception of its negative impact.”

Companies gauging impact of packaging operations



When it comes to shipping and packaging, what then are the priorities that rank highest among shippers? The top three highly important initiatives include:

1. increasing customer satisfaction
2. minimizing damages, and
3. reducing shipping costs.

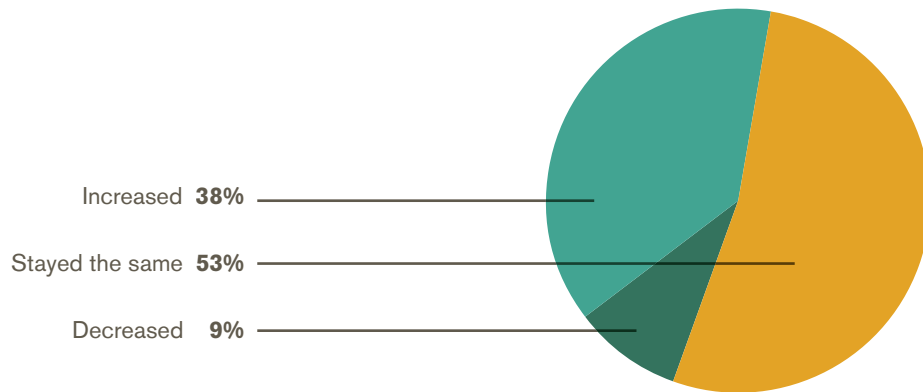
By properly packaging products and orders to keep them in perfect condition through delivery to the customer, damage is reduced and returns are kept minimal, thus ensuring customers' continued satisfaction.

While a customer-centric focus clearly remains a priority, the new norm brought on by the weak economy has companies still continuing to keep a close eye on shipping costs. It's important to note that while reducing carton sizes may decrease shipping costs by shipping more products in a carton, too small a box may compromise a product's integrity causing damage, while a box that's too large will require more dunnage and thus more space and more costs. The right-sized package must achieve a perfect balance of protection and efficiency.

Costs of shipping and packaging

The benefit of packaging to the supply chain predictably and literally comes at a cost. For most companies, shipping and packaging costs have remained the same over the past 12 months. However, 38% have seen their costs increase by 5% to 20%, while only a small minority has seen costs drop.

Annual shipping and packaging costs



When asked in which areas boxing/packaging expenses have increased, managers responded that “increased postage and/or shipping fees” (49%) and “increased labor costs” (46%) continue to drive up expenses. The manual nature of most shipping and packaging operations makes it even more imperative for managers to introduce best practices and procedures into the boxing/packaging process to effectively manage these escalating labor costs.

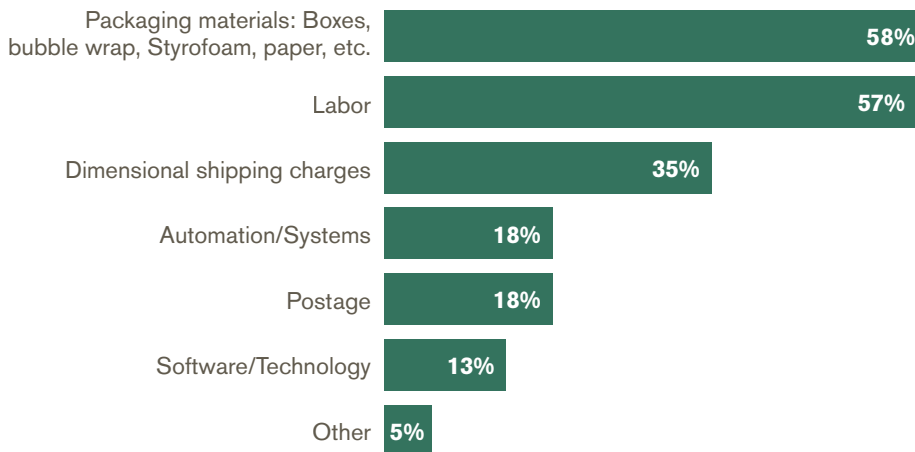
Shipping and packaging managers are then tasked to find ways to control costs. Most are focusing on “the optimization of warehouse space” and “the cutting back on labor” as the two areas that they believe would present the highest potential for savings. When asked in which area they have found the most success in terms of realized costs savings, many responded by reducing the inventory of boxes they have on hand.

What specific part of the shipping and packaging operation are shippers incurring the greatest expense? More than 50% attribute their highest expense to the replenishment of packaging materials such as boxes and bubble wraps. Less than 20% are actually expending resources on capital-intensive projects such as automation and technology. To gain significant efficiencies and achieve greater logistics flexibility, managers may need to consider new leading technologies such as on-demand packaging.

“We’re looking for more efficient packaging methods that use less packaging materials.”

—Warehouse & Distribution Manager; Automotives; \$2.5B+

Most significant packaging and shipping expenses

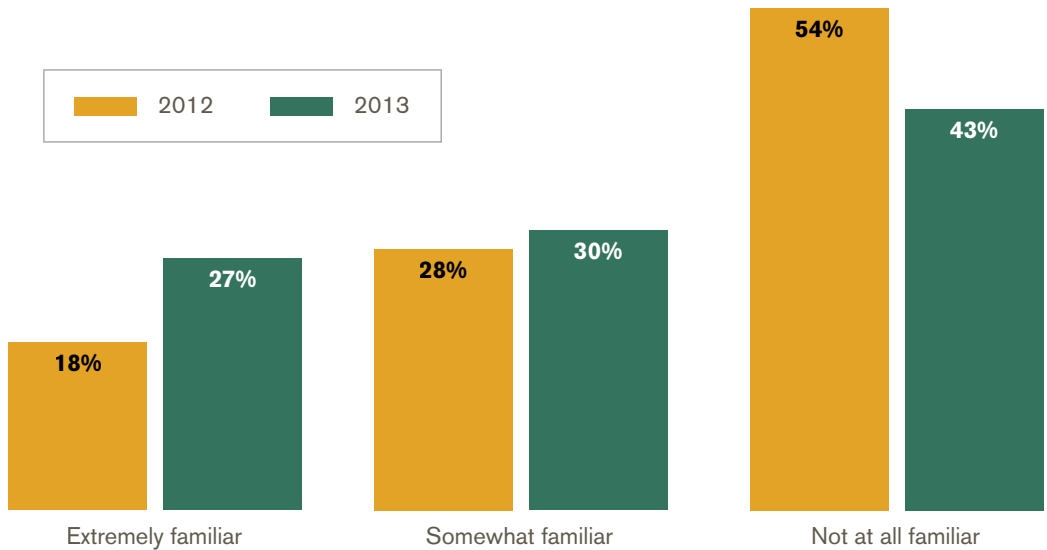


On-demand packaging solutions allow a manufacturer or retailer to automatically create a custom-sized carton specific for every product—or group of products—it ships. These optimized box configurations reduce corrugated inventory requirements and dunnage material within the shipped order, increasing efficiencies in handling and transportation while also minimizing wasted space.

Some respondents are primarily concerned about the cost implications of such a system. In addition, they have expressed concerns that they do not have the minimum case volumes to sustain it nor do they have the space for such a machine.

We further learned that familiarity with On Demand Packaging® is on the rise. When comparing results of this research to a study PRG conducted on behalf of Packsize in 2012, those highly familiar with this system is up nearly ten percentage points (18% in 2012 vs. 27% in 2013). This may be attributed to managers being more open to and accepting of the technology because it improves operational efficiency, reduces both inbound and outbound shipping costs, and prevents the operation from running out of packaging at critical times.

Familiarity with On Demand Packaging™



Summary

Packaging operations face a number of challenges. For those who haven't yet embraced the benefits of an On Demand Packaging® system, it is a challenge to produce shippable, right-sized boxes that protect contents, but also reduce shipping and handling costs as the package is delivered to the customer. With most companies purchasing pre-made corrugated cartons from vendors, there is an additional challenge to store and handle a rapidly growing number of carton sizes to support increasingly complex production and order fulfillment permutations. Finally, there is the considerable expense for filling materials because cartons cannot be sized correctly for shipments in a timely manner.

Today's managers have the unenviable task of confronting the status quo and overcoming these issues. An On Demand Packaging® system can provide packaging operations with the right-sized packages at the right time. By creating more compact cartons, less filling materials and corrugated are needed. This further improves storage, handling and transportation efficiencies throughout the supply chain.

"We currently have to order in advance custom size boxes for upcoming orders and it would be better to make them on the fly, adapting to changes."

—Engineering Management;
Paper Goods;
\$100M – \$250M

Research Methodology

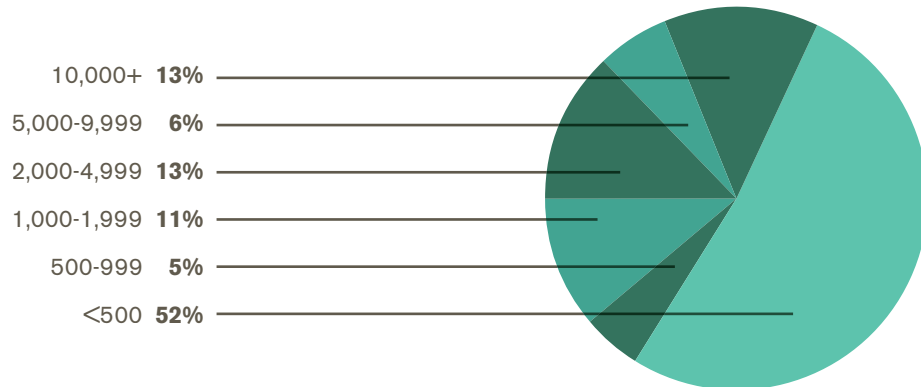
This research was conducted by **Peerless Research Group** on behalf of *Logistics Management* and *Modern Materials Handling* magazines for Packsize International. This study was executed in June 2013, and was administered over the Internet among subscribers to *Modern Materials Handling*, *Logistics Management* and *Supply Chain Management Review* magazines.

Respondents were qualified for being involved in decisions regarding the evaluation and purchase of shipment packaging materials, systems or technologies for their organization.

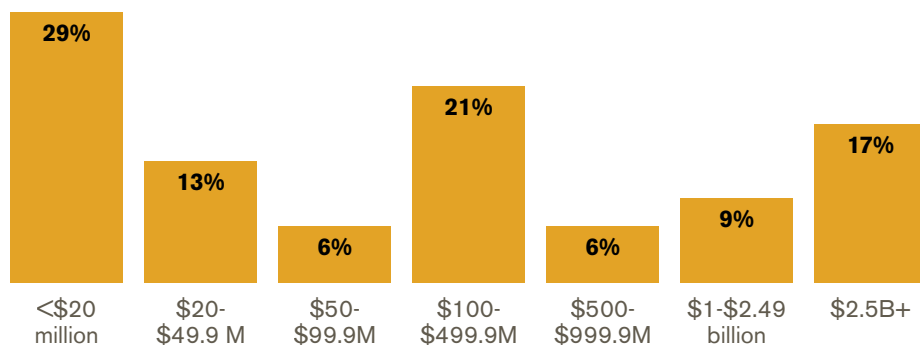
The findings are based on information collected among 322 top materials handling, logistics and supply chain managers. Respondents are predominantly executive management (21%), logistics, distribution or operations management (17%), warehouse or plant management (19%), engineering management (12%) and operations (9%) and purchasing management (5%). Slightly more than one-half (55%) work at manufacturing facilities while others (45%) are employed in distribution, fulfillment or an e-commerce trade.

On average, responding companies ship more than 2,000 packages daily from their location (average: 2,160/median: 426).

Number of packages ship daily



Company sizes represented in this study



About Packsize International LLC

Founded in 2002 and headquartered in Salt Lake City, Packsize International LLC is the world's leading provider of lean packaging systems for businesses with complex corrugated packaging needs. Recognized with several premier industry awards, continuously ranked by *Inc. 5000* and *Deloitte's Technology Fast 500™*, and listed by *Forbes* as one of America's Most Promising Companies, Packsize's revolutionary On Demand Packaging® system gives companies the ability to produce the right-sized box for every product when they need it.

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