



MINIMIZING THE IMPACT OF DIMENSIONAL WEIGHT PRICING

As more and more mailers are taking on shipping duties as well, ignoring these changes in Dim Weight pricing could be detrimental to one's bottom line.

The recent move to expand coverage of dimensional weight pricing by FedEx and UPS has attracted considerable attention from those executives responsible for running fulfillment operations, particularly in companies that ship high volumes of small packages. To adapt to these changes in dimensional weight pricing, fulfillment managers are avidly reassessing options to streamline their packing and shipping operations, such as incorporating cubing software or manifest automation, to minimize shipping penalties for oversized packages. Because no two fulfillment operations are the same, the solution needed will vary from facility to facility. In order to achieve the most cost-efficient solution that delivers the expected ROI, one must understand the key factors relative to dimensional weight pricing as well as assess the optimal automation systems.

The Shift to Dimensional Weight Pricing

Shipping costs have historically been calculated on the basis of gross weight in pounds, or kilograms for many international shipments. By charging only by weight, lightweight, low-density packages become unprofitable for freight carriers due to the amount of space they take up in the truck, aircraft, ship or railcar in proportion to their actual weight.

The shipping of parcels from one location to another requires the need to accurately assess the amount of capacity required to meet shipping demands. All cargo has both a scale weight, or gross weight, and a dimensional weight. By determining dimensions other than, or in addition to gross weight, shippers can pack goods more efficiently and carriers can fill ships, railcars, trucks and airplanes more optimally and profitably.

The concept of dimensional weight has been adopted by the transportation industry

worldwide as a uniform means of establishing a minimum charge for the cubic space a package occupies. Dimensional weight is commonly used for invoicing by truck carriers, air freight forwarders, as well as all commercial airlines worldwide. In 2007, DHL, FedEx, United Parcel Service and the United States Postal Service adopted the dimensional weight system for delivering packages by ground services that measure three cubic feet or more in size.

FedEx made the decision to go with dimensional weight pricing for all of its FedEx freight offerings and FedEx Ground, changes that took effect on January 1, 2015. As of December 29, 2014, dimensional weight was also used to calculate the billable weight of a shipment on all UPS Ground services.

These changes were most likely prompted by years of explosive growth in online commerce — which is expanding at double-digit percentage rates annually — more

so than any other factor. The predominantly small-item, small-quantity e-commerce orders are frequently packaged in oversized boxes for shipping, over-packaging that consumes cubic capacity in trucks at little or no cost to shippers. Delivery trucks cube-out (run out of useful space) before they reach their overall weight limits, resulting in FedEx and UPS needing to operate more trucks to handle the freight, without an increase in revenue.

Calculating Dimensional Weight

FedEx and UPS employ a dimensional weight volumetric divisor, which is used to tally the amount of space allocated to a specific shipment. It is derived by multiplying a shipment's length, width and height, then dividing that figure by its weight, and then dividing it by 166, which is an agreed industry dimensional constant equal to 166 cubic inches.

A box 5" x 5" x 5", for example, would have a space of 125 cubic inches, which divided by the dimensional constant 166, would yield a package that is 0.75 pounds. Any package that is below one dimensional pound would pay actual weight.

A box that is 6" x 6" x 6" would equal 216 cubic inches. Divided by the dimensional constant 166 would produce a package that is 1.3 pounds. FedEx and UPS will round this up to two pounds.

A box sized 5.49" x 5.49" x 5.49", for example, would yield a space of 165.5 cubic inches. Any box that size or smaller would be charged actual weight by FedEx and UPS. Any box larger would be charged dimensional weight. In fact 77.8% of FedEx and UPS ground shipments fall within the 5.5" x 5.5" x 5.5" or larger box size.

The same 166 cubic inch dimensional constant applies, as well, to polybags. Polybags measuring more than 12" x 12" x 1" will qualify for dimensional weight pricing.

Cost increases for packages assessed at dimensional weight compared to actual weight for ground shipments reach 37% higher cost, and for next-day air shipments 45% higher cost.

Until recently, determining a parcel's dimensional weight or "dim weight", has been a completely manual process. The traditional method for determining chargeable weight has been limited to using a tape measure to collect dimen-

sions, manually calculating dimensional weight, and then comparing that figure to gross weight. Manual measurements are time-consuming, inaccurate and slow down the workflow. Despite these limitations, manual determination of dimensional weight is still done liberally today in many fulfillment centers.

Cartonization Software vs. a More Integrated Approach

This latest shift to dimensional weight pricing by FedEx and UPS has prompted logistics executives in most companies that ship small packages to take a closer look at streamlining and automating their fulfillment operations, or risk significant upcharges in shipping costs. Cartonization software is being viewed as a first point of focus for many fulfillment centers attempting to deal with these changes in dimensional weight, particularly those utilizing manual packing operations.

Cartonization software enables predetermined packaging decisions to be implemented based upon business rules, order data and SKU information. Communicating with the warehouse management system (WMS)

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or warehouse control system (WCS), the cartonization software determines optimized packaging based upon the dimensions, weight, fragileness and other factors of the products being shipped. The software directs the packer to use a specific carton size, selecting the smallest size carton for each order. Batches of orders requiring a specific carton size can be generated and allocated to packing lines for those sizes. Cartonization software reduces shipping and packaging costs, and decreases returns.

But cartonization software alone will not deliver the optimized throughput needed for a truly streamlined fulfillment system. Order fulfillment must consider all of the dynamics required to balance workloads and efficiently process orders. Managing order fulfillment efficiently requires the right software tools to intelligently optimize the order mix to meet delivery time windows, and ensure a continuous order flow across the pick, pack, and ship processes.

Pick, pack and ship processes utilize an array of automatic identification and data capture (AIDC) technology, such as barcode scanners, optical character recognition (OCR) and radio-frequency identification (RFID) to efficiently monitor the flow of goods through picking, sortation, conveying, weighing, dimensioning systems, labeling and packaging. These units need to capture and relay data to and from the WMS or WCS and other material handling equipment (MHE) in the system. In high-volume fulfillment centers this transmitted data can represent millions of process transactions per hour. The control system must be capable of effectively executing these throughput processes with the most efficient cycle times.

Such control systems are particularly applicable for e-Commerce fulfillment operations. With its seasonal spikes, and growing SKU counts, online fulfillment creates specific challenges for defining the processes and software requirements to achieve a streamlined operation. Thou-

sands of orders per hour of single-item and multi-SKU orders, a wide variety of product shapes, and the customer-driven demand for the lowest cost transportation method frequently results in throughput slow-downs for Internet fulfillment operations. With the recent changes in dimensional weight pricing, Internet order fulfillment is now even more so under pressure to find the proper balance of picking, packing and shipping technologies that will deliver the most cost-efficient solutions.

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Assessing the Correct Move Forward

Low-volume fulfillment centers, those shipping less than 1,000 packages per day, should certainly consider implementing cartonization software as the first step in addressing FedEx and UPS volumetric shipping penalties. This is a considerable step up from paper-based, manual fulfillment, providing improved flexibility. This could also be integrated with intelligent picking, such as RF pick-to-cart, with a seamless IT interface

Higher volume fulfillment centers, those processing 1,000 to 50,000 or more packages per day, would start with cartonization software, and would benefit from a more automated picking solution, like voice-activated picking or pick-to-light. An automated manifest system should be incorporated, as well as an in-line scales and dimensioners.

As part of the change in dimensional weight pricing, FedEx and UPS require that the fulfillment center send them dimen-

sional information on every package being shipped. For high-volume fulfillment centers, an inline checkweigh dimensioner is a very useful addition, as it will weigh each package, capture the package's dimensions and forward to the shipping carrier which sends a label back to the fulfillment center. A print-and-apply labeler will then automatically apply the appropriate shipping label. This package is now ready to be shipped. The process can be further automated by sorting these packages directly to the dock doors. Each of these functions would then be integrated within a seamless IT interface.

If polybags are being used, and more than 1,000 polybags are being filled per day, an automatic bagging station should also be integrated into the system. A well designed bagging system will incorporate an in-line scale and automated printer to print the correct manifest directly on the bag.

Both automated bagging and carton manifest lines can greatly reduce headcount. A manual carton manifest line typically takes five to six laborers per shift to operate. Manual bagging is close to the same. A properly designed automated system can reduce the operation to one or two operators, and increase throughput at the same time.

Fulfillment executives can minimize the impact of dimensional weight pricing now being imposed by FedEx and UPS. For most distribution operations, assessing optimal automation systems will be necessary to achieve the most cost-efficient solution that delivers the expected ROI. ■

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