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Can Ten Pounds of Feathers Weigh More than Ten Pounds of Bricks? It All Depends on Your Dimensional Factor

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While negotiating contracts with your carriers, it's not enough to focus on just the price that you're paying on a rate sheet; you also need to pay close attention to the dimensional factor that is being applied to your shipments.

A dimensional factor is a number that is used by the carrier to assess the effective weight of a shipment based on its density (i.e., how much space the package takes up per pound). If the effective weight of a shipment based on its dimensions and factor is calculated to be heavier than the actual weight of the package, the carrier will charge you according to the higher weight, called the "dimensional, or DIM, weight."

If you were shipping 10 pounds of bricks, which fit nicely into a 10 x 10 x 10-inch box, then the volume of the box is 1,000 cubic inches. With a dimensional factor of 166, you would divide the cubic inches by the factor and come up with a calculated dimensional weight of about 6 pounds. Because this is less weight than the actual weight of the package, you would be charged the 10-pound rate.

If you were shipping 10 pounds of feathers, you would need a much larger box, perhaps a 15 x 15 x 15-inch box. With the same dimensional factor of 166 and a volume of 3,375 cubic inches, the dimensional weight would be calculated at 21 pounds. For the same 10-pound manifested shipment, you would be charged at the 20-pound rate by the carrier due to the dimensions of the package.

Carriers use dimensional factors to protect their profitability. Each truck has a limited amount of space and a limited number of packages it can transport per run. Without dimensional factors, a carrier would charge the same price for a large box of feathers as it would for a relatively small box of bricks. A standard truck that holds 670 cubic feet could ship about 1,100 boxes of bricks, but only about 340 boxes of feathers. Without a dimensional factor, the carrier could lose 70 percent profitability per truckload. By using dimensional factors to increase prices based on shipment densities, carriers are able to ensure they remain profitable.

While dimensional factors can be negotiated, most of the time, a shipping company will use the standard dimensional factors that are determined by the carriers. In the US, UPS and FedEx use the same standard factors. In 2010, all domestic shipments within the US were assessed with a dimensional factor of 194; all international shipments to/from the US were assessed with a dimensional factor of 166. In January of 2011, these were changed to 166 for domestic packages and 139 for International packages. By decreasing the factor (of cubic inches per pound), the carriers have allowed themselves the opportunity for more profitability per volume. The 10-pound box of feathers, as I assessed it, would be 21 pounds with the 2011 domestic dimensional factor of 166. Back in 2010, at a dimensional factor of 194, that box would have only been assessed to be 18 pounds. While a 3-pound difference may not seem like much, depending on the service level of the shipments and your contracted rates with the carrier, the cost of sending boxes of feathers could begin to reach very significant amounts.

The best way to reduce dimensional factor-related costs is to streamline your shipping processes so that they simply do not occur. Take an inventory of the standard boxes that your facility uses for shipping. Then, for each box, calculate the volume in cubic inches. Next, divide the volume and dimensional factor, and that will give you the minimum weight that should be used for that box size. This will help you avoid being charged extra by the carrier due to a dimensional factor.



If you tend to ship packages that are frequently being assessed at a dimensional factor, bring it up when negotiating contracts with your carrier. Carriers have the ability to add dimensional factors that are improved over their standard factors to your contract.

You may choose to hire an outside third-party company to help you analyze your shipping characteristics or to consult you regarding contract negotiations. Many third-party companies are well-versed in dimensional factors and can help you identify ways to reduce your dimensional weight costs.

At this time, carriers have not made any determinations about another change to the standard dimensional factors in 2012. If these do occur, you should look for a public announcement which would likely be made in November or December, as carriers determine at the end of each year how their published tariffs and services will change in the next year.

If you take precautions and proactively work to negotiate factors with carriers, you can greatly reduce your chances of having to pay extra due to dimensional weight calculations. Taking the time to investigate your dimensional factor-related charges will be worth your while when you are able to successfully eliminate unnecessary charges.