WHITE PAPER

Why Zero-Air Packaging is a Megatrend

UPS/FXG are at capacity – For decades, the two major carriers have been scrambling to modernize outdated sortation hubs with ultra-high-speed sorters and automated induction systems. After huge investments in increasing capacity, the results have been disappointing. Sorting packages with less human intervention has saved labor and increased accuracy, but systems are operating at half their design rates. Why? The upstream conveyors are so loaded with cubic volume that giant slugs of packages clog the system, requiring shutdowns to clear jams, which in turn shuts down the automated sorter, which then must spool back up, wasting valuable throughput. Just six jams per hour can reduce the rate of an automated system by half.

In reality, throughput isn't governed by the number of packages being sorted – it's determined by the cubic volume of the packages flowing (or not flowing) through the system. Because of arcane motor freight rules, weight determines the base cost of shipping even though weight doesn't factor into parcel shipping capacity. Trucks, conveyors, and sorters never weight-out, they cube-out. Consequently, UPS/FXG inflicts a complicated set of size penalties on shippers which derives the weight-based price from a cube-based cost – more precisely, pricing is based on density.

IQpack analyzed hundreds of 2021 parcel freight invoices, using big-data algorithms, and the strategy is apparent. Shipping prices are based on the density of a fully weighted 53-foot tractor trailer. A 53-foot trailer holds 42,000 lbs and 3,400 ft^3 of freight for a theoretical max density of 12 lbs/ft^3. Clearly, UPS/FXG have calibrated their pricing to charge customers a minimum of 12 lbs for every cubic foot of packaging– regardless of the actual weight.

Small parcels are typically 50% air – Standardizing box and bag sizes results in a lot of extra space around the product which causes products to jackhammer in transportation. The extra air space is filled with air pillows which generally fail to prevent damage, requiring a second shipment or a refund. Adding insult to injury, the carriers, through elaborate pricing rubrics, are charging for 12 lbs of freight for every cubic foot of those air pillows. Shipping 50% air essentially doubles shipping cost when you factor in penalties. Customers universally demand "free" shipping, so the massive cost of shipping air is having a meaningful effect on the bottom line.

Conclusion: There is no business case for shipping air –Technology for right-sizing boxes has been around for decades, but mostly for low volume, slow pack operations, such as furniture and cabinet products. Recently, carton wrapping systems have sprung onto the market which reliably pack, seal, and label orders at high speeds with virtually no human intervention. IQpack predicts that these systems will be in high demand and low supply by the second quarter of 2022 when the reality of the new UPS/FXG freight rates hits e-commerce shippers. Additionally, IQpack predicts a severe shortage in fanfold corrugated by Q4 of 2023, which is the primary raw material used in right-sized packaging systems. Fanfold is a specialty product that is difficult to produce, with few suppliers, most of whom have complicated conflicts of interest and market restrictions. Zero-air solutions will have a massive ROI, but late adopters will likely face long-lead times for machinery, and difficulty obtaining supply contracts for corrugated fanfold.