

## Smart-Size It!

*How to save millions on warehouse automation.*

**You're looking into warehouse automation and you've already decided that an ASRS system is the way to go.**

But with ASRS costs reaching well into the millions of dollars, you've got to get the size right. Overestimate, and you waste valuable capital. Underestimate, and you won't meet future demand. So at Haskell, we take a scientific approach to ASRS planning. It's how we helped a consumer products manufacturer **cut the projected installation costs of their ASRS system by \$1.5 million.**

### Introduction

When this global consumer products manufacturer came to us, they were working on plans for a new product introduction. Based on their estimates of future demand, they decided that a \$3 million ASRS installation would be required. However, with so much capital at stake, they wanted a second opinion.

The client asked us to provide a separate estimate based on peak inventory levels 10 years out. After conducting a sophisticated analysis, we determined that they could easily meet future demand with a system that would cost half as much – potentially saving \$1.5 million.

### An Educated Guess

To help this manufacturer optimize their ASRS system, we took a different approach for estimating the necessary rack space. We wanted to make sure our client would not be wasting capital on capacity that might not be used, but we also had to ensure that the company would not sacrifice potential revenue by installing a system that wasn't large enough to fulfill customers' orders in a timely fashion. Traditionally, engineers have tackled this dilemma in one of three ways:

- ▶ **Estimate average inventory levels three years from now** – While this may seem like a low cost option, it's based on the hope that the warehouse could expand in time if volume increased. This kind of assumption puts your

organization at risk and if mis-calculated can cost millions in lost sales revenue.

- ▶ **Estimate peak inventory levels three years from now** – This method is more conservative, as it takes volume spikes into account. But it's still shortsighted and doesn't account for the long-term investment that's about to be made.
- ▶ **Estimate peak inventory levels ten years from now** – This is very conservative and it is a widely accepted approach for conventional warehouse planning. However, it doesn't provide the level of accuracy needed when planning an automated warehouse – where excess capacity is extremely costly.

Most engineers rely on the third method for their ASRS planning, and that's exactly what our client asked us to do. However, we chose a different method – **one that would deliver much more accurate estimates and create significant savings for the company.**

### An Accurate Formula

To define our client's actual ASRS requirements, we estimated their safety stock inventory requirement (minimum levels) and predicted production quantities 10 years into the future. Taking advantage of proven industrial engineering theory, we calculated the Economic Order Quantity (EOQ) to account for changes in demand.

THE ECONOMIC ORDER QUANTITY FORMULA:

$$EOQ = \sqrt{\frac{2K\mu}{HP \frac{1}{52}}}$$

K=Setup Cost  
 H=Holding Cost  
 P=Cost of Pallet  
 μ=Average Weekly Demand

This allowed us to estimate costs based on a variety of service levels. To ensure the ability to fulfill customer orders, most companies aim for service levels in the 85-95% range. However, this consumer products manufacturer set their service level requirement at 99.99% – with the goal of reaching 100% customer satisfaction. This near-perfect service level defined the required safety stock level, and that's how we arrived at the EOQ.

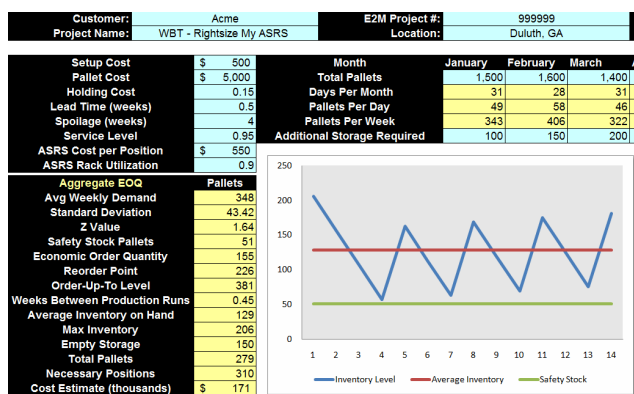
## A Comprehensive Analysis

We began the process by collecting data from the consumer products manufacturer (we provide a data entry sheet to make this easy for our clients). Once we received the data, we ran our comprehensive analysis. With little-to-no room for error, we determined the safety stock levels required to meet our client's 99.99% service level.

We also made sure to account for potential changes in demand. For example, during the summer, consumers use more of our client's product, so we built that seasonal demand increase into our 10-year analysis. We carefully balanced the likelihood of a stock-out against the cost of a larger ASRS system.

Within a matter of days, we delivered the results of our analysis in a clear, easy-to-understand report, along with our recommendations. The client was able to make a better informed decision about their ASRS system and size it based on safety stock levels, not just inventory peaks.

## Spending Cut in Half



By determining the optimal amount of required rack space, the client was able to halve the estimated costs of their ASRS installation – effectively saving \$1.5 million in capital expenditure. The client was also given the confidence that future demand would safely be met.

With over a decade of experience in calculating ASRS needs, we used a proven approach that was both cost-efficient and time-efficient. Because we don't

manufacture or market ASRS systems ourselves, our analyses and recommendations were completely unbiased and objective. And our client received a great deal of value in the process.

## DIY

Our client greatly reduced their potential capital expenditure through proper estimating – and you can too. Here's what we recommend when you're considering a new ASRS system:

- ▶ **Set your design year at least seven years in the future** – This ensures your ability to meet future demand and protects you from having to make additional investments.
- ▶ **Establish a safety stock level** – Do this by modeling the desired service levels and variability of similar products and by anticipating peak requirements.
- ▶ **Use an established model formula** – The Economic Order Quantity (EOQ) is by far the most accurate, effective way to calculate production quantities and inventory levels. It's the core of our methodology at Haskell.
- ▶ **Add the safety stock levels, average inventory level and anticipated production quantities** – This provides a more realistic, meaningful picture of your warehouse operations.
- ▶ **Use computer models to test and validate your design** – One of the unique strengths of Haskell is our modeling capability. We can set up and run a computer model of your warehouse with the proposed ASRS system installed. We'll use time-based dynamics to help you test and validate the design.

## Questioning Whether to Buy Small, Medium or Large?

Then, let's talk. At Haskell we have the skillset and the experience to help you make a well informed decision. And with millions of dollars on the line, right-sizing your system is a decision that you've got to get right.