

Minimization of Galvanized Steel Expedite Costs

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Abstract

CST Storage sponsored a senior design project to address issues with order fulfillment and expedite costs. For CST Storage to make and distribute tanks for consumer use, raw steel is sent to galvanizers to be treated and cleaned. In order to catch up with customer orders and still maintain a schedule, this galvanization process is being expedited at the expense of CST Storage. This project has studied the causes of galvanized steel expedite costs, as well as researched and designed a Kanban system to assist management in the implementation of process changes that can deliver improved on-time order fulfillment and reduction in expedite costs.

Introduction

CST Storage manufactures and sells tanks that hold industrial liquids, grain, food, water, oil, gas, wastewater, coal and more. We worked with the plant in DeKalb, Illinois. The company makes all their tanks to custom orders and ships them all over the world. The goal of this project is to decrease the number of expedited galvanized parts. To accomplish this, we analyzed historical demand data and developed a Kanban system to manage the parts.

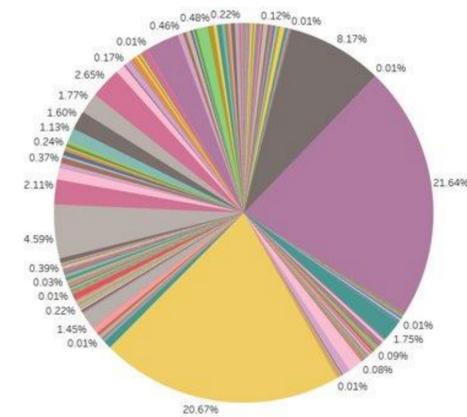


Figure 1: Bar Chart of All Parts from 2019

Methods

To get an understanding of demand and any seasonality, we had to use outgoing load tallies of daily loads and assume that as demand data, since CST recently switched ERP systems and no other data was available.

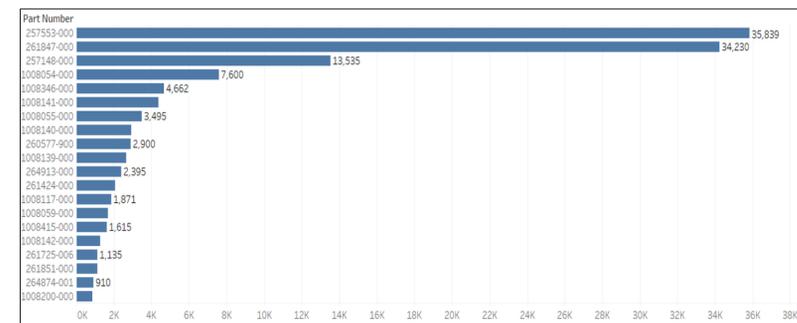


Figure 2: Pareto Chart

A pareto chart of the top items was created and the top ten parts were selected which compromise 67.9% of total parts shipped to the galvanizers. The demand data used to then calculate order quantities, safety stocks and reorder points.

Results

The most popular parts or the "high runners" that are required in assembling the products for CST were identified, and we calculated their appropriate safety stock levels. We suggest assigning a worker to validate the safety stock once a week and reporting any shortages to the planning department. The planning department will reorder as needed. We delivered an Excel tool to the the company that calculates appropriate safety stock levels and reorder points for their high runners . Cue cards can be used to visually manage the inventory in the Kanban system.

Discussion

Initially there was no safety stock held at CST's facility. Our main objective is decreasing the number of expedited galvanized parts that account for roughly half a million unnecessary dollars spent annually. Utilizing safety stock quantities for what is sold the most ensures those high runner parts will be on hand ready to ship on time. Other options such as improved storage solutions (racks, shelving, etc.) can provide a more organized approach when fulfilling customer orders.

Conclusions

Our proposal highlights reorder points and cue cards for implementation of a Kanban system. The cue cards will be various colors with each part number, part location and batch quantity on the card. CST then will be able to attach them to their appropriate storage shelves or baskets to have as a visual cue to replenish safety stock, as necessary. The safety stock levels are to be recalculated every six months as the company's orders will fluctuate.

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