Vitamin Shoppe 2: Damage Reduction Design

Overview
Vitamin Shoppe is a specialty retailer offering 20,000 nutritional products and sells around 46 million units of product per year. Due to the high volume shipping, many products become damaged during the in-transit process. These product damages often cause collateral damage resulting in replacement expenses, reshipping costs and lower customer satisfaction ratings.

Objectives
The Penn State team is given the task of designing universal packaging components to ensure protection of 30 of the top 50 most damaged items. The solution must be applied within 25 seconds per shipment. The final recommendations should include a cost effective solution based on the ROI and a zero damage solution to ensure a product protection guarantee. The proposed systems must be easily implemented and absorbed into the existing packaging and shipping processes at the Vitamin Shoppe distribution center.

Approach
The Penn State Team first started the project with a visit to the Vitamin Shoppe Distribution Center in North Bergen, NJ. This provided the team with clear project parameters, current packaging techniques, example damaged items and implementation constraints. With product analysis of the top 50 most damaged products, four main solutions were proposed to prevent in-transit damage. Drop tests and actual shipments with Vitamin Shoppe products were performed to analyze the reduction in damage. A full cost analysis was completed based on materials, setup costs, maintenance, labor, and other distribution center costs to compare the different solutions.

Outcomes
The proposed solution includes cardboard dividers to prevent product to product interaction during shipments. Low material costs and simple programming changes allow the packaging technique to be used only on the 50 most damaged items. The zero tolerance solution also includes a foam liner for added protection. The ROI analysis proves that both methods will break even with less than a 1% improvement of damaged shipments. The proposed annual savings include $899,622 for the cost effective solution and $2,093,266 for the zero tolerance solution.