

Volume Loss Minimization in Slitting Operation: Case of a Packaging Company

Anupam Tripathi¹ A. Subash Babu²

¹Analyst, Flipkart Internet Pvt. Ltd., Indian Institute of Technology, Bombay, India

²Professor, Mechanical Engineering Department, Indian Institute of Technology, Bombay, India

Abstract

The problem of determining optimum size of cutting stock is pertaining to the slitting operation. This study is carried out at a Packaging and Tubing company. Problem is to identify size patterns for slitted webs or optimum size of jumbo roll to minimize waste generated in the process. Constraints are capacity requirements, end product size specifications and number of webs to be produced along with height, length and width of the rolls. Descriptive Statistics and data analysis is used to determine the process parameters and measure the performance. These performance measures are measured for process control by using I-MR chart and X bar S chart. With the help of data analyzed the information is gathered to build MIP models to minimize waste from the process by identifying efficient patterns and controlling trim and volume loss. An integer programming model is developed to find optimal cutting patterns of the laminates with objective of minimizing the trim losses. These models are deployed using CPLEX solver in AMPL.

Keywords: *Cutting Stock Problem, MIP, Integer Programming, Pattern optimization, Volume Loss Minimization, Trim Loss Minimization, Jumbo rolls, width Loss Minimization*