

SENIOR DESIGN ORGANIZATION SYNOPSIS – SPRING 2013

MATERIAL SELECTION MECHANISM

Team 11: Hernando Garcia, Juan Rocha, Mahdi Mohammadpour

Faculty Advisor: Dr Boesl

Vinyl Corp is currently in need of a system that has the capability to transport and classify material; the system needs to be able to sort two types of materials (Interior and Exterior) by size and shape. The major goals within this project are: maximize facility's walking space by being able to design a system that will transport and sort the material above head level, reduce material contamination by preventing the contact of the material with ground impurities, and finally reduce physical labor performed by the operators by eliminating material removal, sorting, and relocation by hand.

The above described system consists of four stages: Stage one consists of the collection and removal of material from the mill. Stage two consists of the manual selection of the material depending on its nature and properties (exterior or interior); it includes a selection valve that directs material into a desired duct. In stage three, the material is transported to a filter mechanism, which leads us to our final stage, material sorting by size.

In the process of completing the previous mentioned stages, vacuum and auger systems that are currently in the market are being considered for performing the task described in stage one. A selection valve, which will be manually operated by the worker, is intended to do the duty mentioned in stage two. An auger implementation is taking care of the job in stage three, and ultimately a unique rotating filter mechanism is being well thought-out for stage four.

This particular system, Material Selection Mechanism, serves as a prototype for all material sorting processes such as recycling and food processing. Vacuum and auger systems are currently available in the marketplace, but are only used for material conveyance. Whereas the above mentioned mechanism not only performs this task, but also adds a new feature to the process.