

Circle Feeders® Eliminate Flow Problems in Synthetic Paper Recycling

The manufacturer of a synthetic paper product had problems recycling rolled paper trimmings. The trimmings were sent to a granulator to be cut into small confetti size pieces for easier processing in the recycle step, then pneumatically conveyed into surge silos. The cut paper arched severely, and its low bulk density (less than 10 lb/ft³) required very large silos. Consistent discharge of approximately 10,000 pounds per hour was demanded to pre-vent blockages in the pneumatic conveyors. A single blockage required that hundreds of feet of pneumatic tubing be manually removed and cleaned, causing complete shut down of the process.

LCI's Circle Feeder was tested and found to solve the processing problems. The Circle Feeder's design allows for a large inlet that exceeds the critical arching diameter for most materials. The large open throat that was the same diameter as the silo allowed for a straight-walled design which eliminated the typical cone and greatly reduced overall headroom.

Pilot scale testing indicated that slow rotation speeds with an enlarged exhaust port allowed for very high discharge efficiency. An additional benefit was found in that the rate could be varied reliably over a 10:1 range. Since the paper was very light, "self revolution" stoppers were included in the straight-walled hoppers to prevent the material from turning and to allow mass flow.



The customer specified a one-piece design to minimize installation time.

Four large Circle Feeders were purchased to handle the various grades of paper. Although the Circle Feeder can be made in sub-assemblies, the customer preferred a one-piece design to minimize installation time. Due to their large sizes, special shipping arrangements were made to position the feeders diagonally on the trucks so that width could be minimized.

All the Circle Feeders were started up with only one instance of difficulty, and this was due to a downstream malfunction. All continue to operate 24/7 per the original design. In addition, the plug flow operation of the paper enabled first in/first out confidence, allowing the customer to track changes in their feed material.



Testing Results in Solutions to Other Problems

While attending these pilot scale tests, the customer realized that they had two more areas where the Circle Feeder might solve difficult processing problems.

Micronized calcium carbonate was tested successfully. It has extreme flooding tendencies when

aerated but is difficult to flow when allowed to settle. Also, a special titanium dioxide that was extremely cohesive and exhibited arching and rat-holing properties was tested. A Circle Feeder was purchased for each of these materials.