

Is there such a thing as a Hybrid Gravity Conveyor?

The Answer is Yes - and it's an Alternative that Provides Carton Control with Less Energy Usage

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Much of the buzz at the recent ProMat 2009 trade show centered on the application of Motor Driven Roller (MDR) technology as an alternative to the more conventional belt-driven systems. (See **Pro-Mat 2009 Review and Comment**). However, lost in the glitz of the showy chrome-plated rollers is a relative simple MDR application that can control the flow of packages on gravity conveyor lines while reducing energy consumption.

Harnessing the power of Gravity

It is doubtful that esteemed Sir Isaac Newton spent time thinking about conveying applications for gravity, but if he had he would have discovered that there are a few problems with it. For example:

- having sufficient pitch so that small light weight cases flow down the conveyor
- uncontrolled speed buildup of heavy cases
- large heavy cases colliding with small light cases causing jams and product damage
- excessive buildup of line pressure, especially at the discharge end

These are just some of the more prominent challenges – there are others.

To combat these problems, material handling product engineers have developed lots of ingenious ways to take advantage of the free and naturally occurring force of gravity while attempting to control the flow of cases on a pitched roller conveyor line.

These include applying friction brakes equipped with elastomeric urethane wheels that deflect and absorb kinetic energy through hysteresis, as well as more

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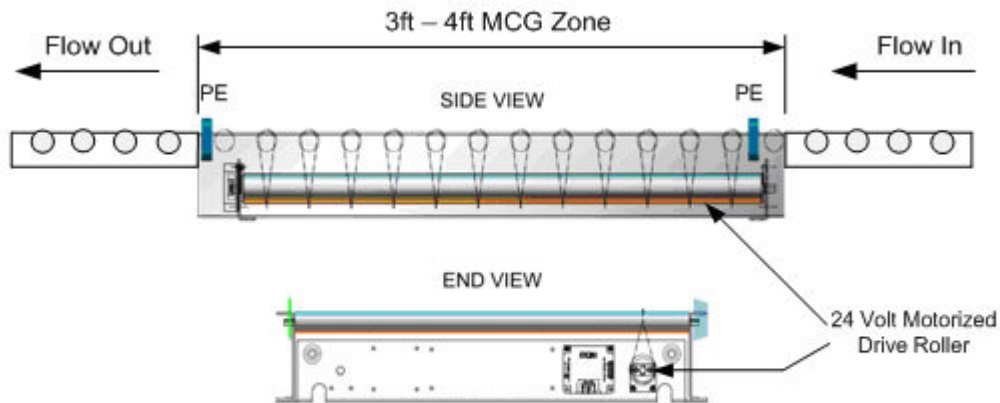
elaborate designs involving brake pad assemblies, cams, springs, elongated cable systems, fluid pressure, pneumatic pressure, and a host of other equipment and apparatus all of which are designed to provide some degree of flow control.

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A few conveyor manufacturers have recently developed what could be considered a **"hybrid"** solution, meaning that it uses a small amount of electricity. Referred to as Motorized Control Gravity (MCG), it's intended for use in shipping line conveyors to transport cases from the shipping sorter to the dock for palletizing or fluid trailer loading applications.

An example is shown on the next page.

Is there such a thing as a Hybrid Gravity Conveyor? (Con't)



Motorized Control Gravity Module
Source: FKI Logistex

How it Works

In a pitched gravity roller shipping line that is 60 to 80 feet long (for example), there would be 3 to 4 MCG Modules, as illustrated above. Each module would have a powered roller bed zone that is 3 to 4 ft long. A 24 volt motor and gear box assembly is inserted inside the drive roller (like a ship in a bottle).

As a case enters a zone and trips the photo-eye (PE) on the in-feed end of the zone, the 24 volt motorized drive roller is de-energized for a specified time delay (about 2 or 3 seconds), which causes a temporary braking action of the carrying rollers. After the time delay expires, and the PE on the discharge end of the zone is clear, the drive roller is re-energized and the case is released to the next MCG located about 20 feet downstream.

However, if the PE on the discharge end of the zone is blocked when a case trips the in-feed PE, the drive roller remains de-energized stopping case flow thru the zone. When the dis-

charge PE is clear, flow resumes.

Problem Solved

The accumulated backpressure is limited to the distance between the gravity control flow modules – about 20 feet. In this way all of the various size and weight cases will flow smoothly from MCG to MCG down the shipping line.

In many system applications, MDR technology has the potential to save cost on the shipping dock by replacing decline belt and zero-pressure accumulation conveyors with Motorized Control Flow Gravity while at the same time reducing energy consumption.

So, with a little creative thought and innovation, adding Motorized Control Flow Gravity to your material handling system becomes a low cost **Green** alternative worth considering.