CONVEYOR ENERGY CONSUMPTION IS GETTING ATTENTION

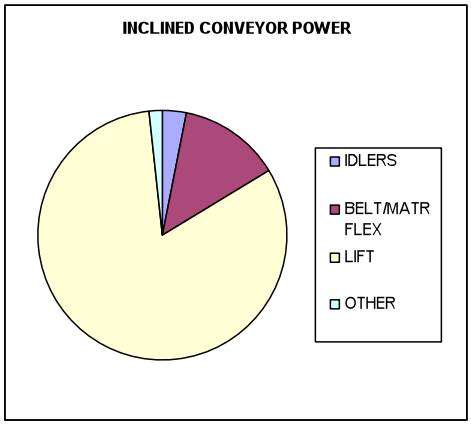
We've all seen increases in energy costs. Gasoline, heating fuel, and electric prices are up. Our customers are seeing this also and are looking for ways to minimize the costs. One method impacting PPI is the desire to reduce a conveyors power consumption. An important component in this effort is the ability to predict the power used by a conveyor. Accurate predictions make optimized component selection easier. Safety margins for inaccuracies can lead to inefficient oversized selections. On the other hand, pushing safety margins too far can lead to failures or conveyors not running. This is fueling interest in the ability to more accurately calculate conveyor power consumption.

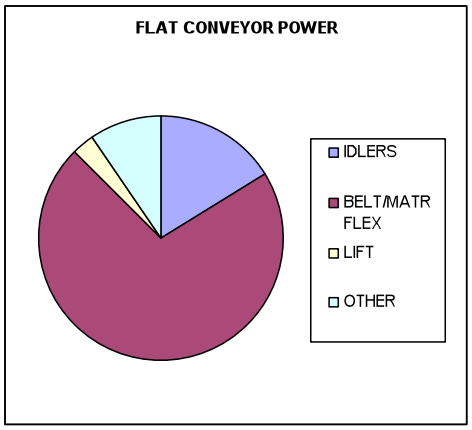
At the recent SME conference, conveyor power consumption was a common element in the papers presented. Our trade organization, Conveyor Equipment Manufacturers of America or CEMA, is working to stay ahead of this trend. Major improvements to the CEMA power calculations are in the works and will be discussed at the CEMA Engineering conference in June. Our products can have a noticeable impact on the power used by a conveyor.

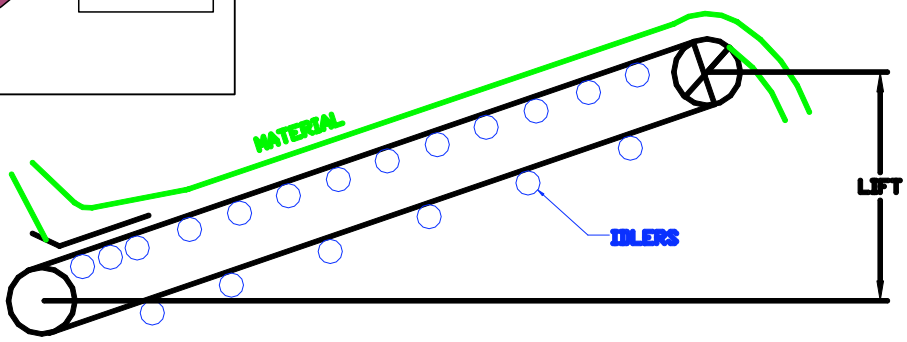
COMPONENTS OF POWER:

<u>Material change in elevation:</u>

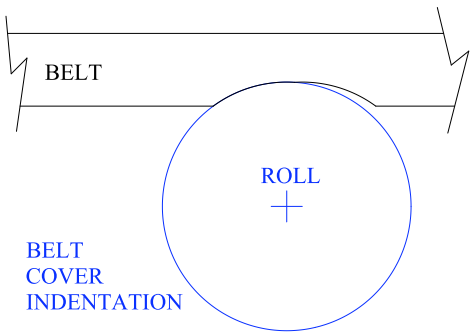
When a person lifts a box they expend energy overcoming gravity. Conveyors that lift material up an elevation consume power in the same way and lift is often the primary power component. Lift power can't be changed so when it dominates the total power use it is difficult to make improvements. When lift is low other power improvable components become significant.



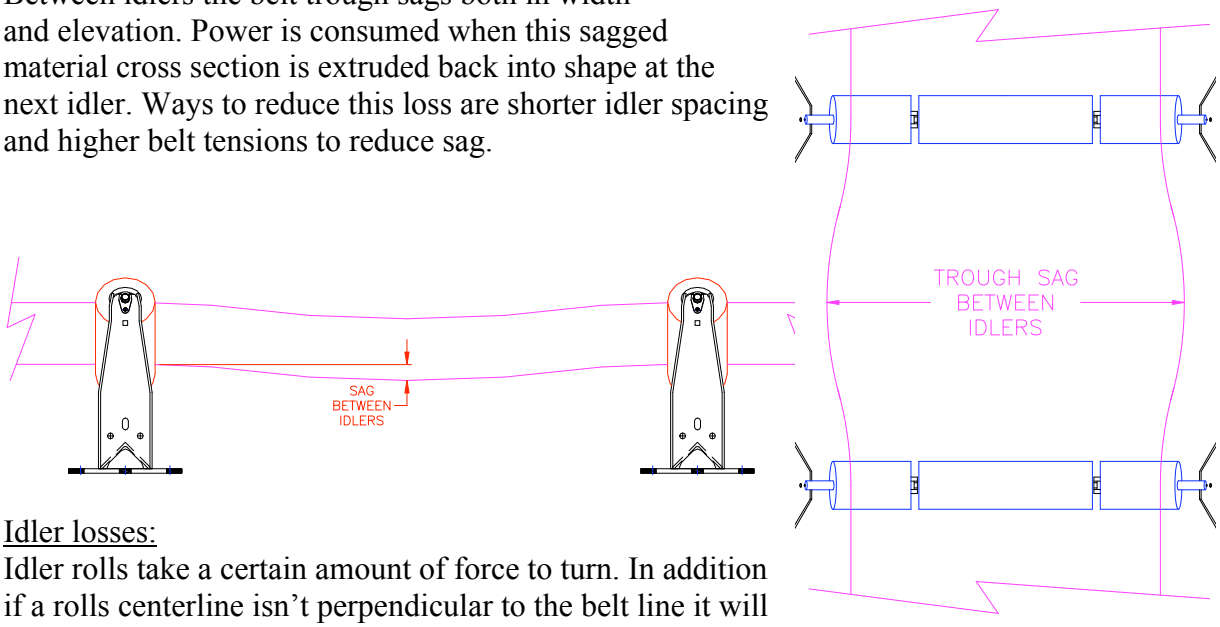




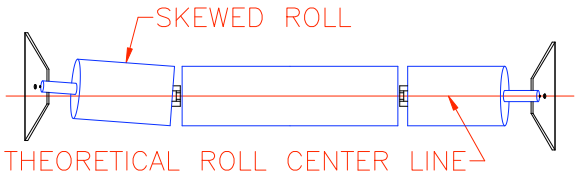
Belt flexural losses.
The rubber belt indents and flexes as it comes in contact with pulleys and idlers. Power is used overcoming these rubber indentation losses. Ways to reduce this loss are special rubbers, larger diameter idlers, shorter idler spacing, and higher belt speeds.



Material flexural losses.
Between idlers the belt trough sags both in width and elevation. Power is consumed when this sagged material cross section is extruded back into shape at the next idler. Ways to reduce this loss are shorter idler spacing and higher belt tensions to reduce sag.



Idler losses:
Idler rolls take a certain amount of force to turn. In addition if a rolls centerline isn't perpendicular to the belt line it will create a sliding loss. Ways to reduce these losses are to reduce the number of rolls used, increase the idler diameter, reduce the idler frame straightness tolerances, reduce the conveyor alignment tolerances.



Other losses:
Pulley bearing friction, cleaner friction, skirt friction, and material acceleration during loading are some secondary losses. In special cases they can be important, but are generally small components to overall power.