

MATERIAL HANDLING SOLUTIONS: TUBULAR CHAIN CONVEYORS: CHAIN DESIGNS

SPECIAL MERITS, BENEFITS & ATTRIBUTES

Globally, three distinctly different Tubular Drag Chain Conveyor designs are available:

- » Steel Rope Design (*Aeromechanical Conveyor*)
- » Bicycle Chain Design (*Sealed Pin Chain*)
- » Luxme Link Chain Design (*Link Chain*)

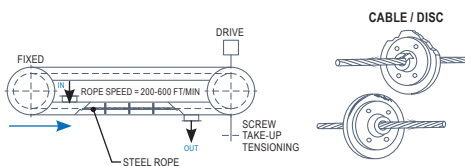
The special and unique features of Luxme's design are highlighted in the following comparison study:

STEEL ROPE DESIGN

The first conveyor shown in figure 1 is an Aeromechanical conveyor, which incorporates a Steel Rope with discs running at a rope speed of 200-600 ft/min. The major weaknesses of this design are as follows:

- » Needs an externally controlled feed to the conveyor. It does not perform well when flooded or choke fed and it cannot be started full of material.
- » Broken discs, frayed rope and stretched rope are commonly reported problems.
- » The idler and the drive are fixed and the screw take-up periodically needs to be adjusted manually to compensate for the stretch in the rope.
- » The discs are an integral part of the rope; therefore it is extremely expensive to change the steel rope and the discs.

FIG. 1 - STEEL ROPE DESIGN

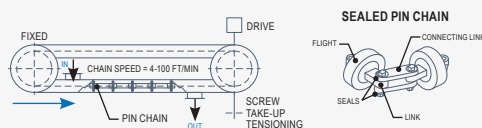


BICYCLE CHAIN DESIGN

The second conveyor shown in Appendix I shows a one-piece disc arrangement with sealed pin chains. The following are the operating and mechanical disadvantages for this design:

- » The entire chain assembled with rotating parts is totally immersed in the product. Product packs the space between plates, pins, bushings, etc. during conveying of product and may result in maintenance nightmare.
- » The idler and drive are fixed and the screw take-up in the drive needs to be adjusted manually periodically to compensate for chain expansion due to temperature difference (*summer, winter, etc.*), wear and tear, tension due to variable speed adjustment, etc. If not, the chain may jump out of the drive sprocket resulting in equipment damage.
- » For Food Grade applications – During wash down cycle, the water will stay in the pin cavities and bushings and may result in product contamination.

FIG. 2 - BICYCLE CHAIN DESIGN



LUXME LINK CHAIN DESIGN

The third conveyor shown in Appendix I is the Luxme design. The major advantages of the conveyor are as follows:

- » Steel plates welded to the continuous case hardened link chain and UHMW and polyurethane discs are bolted to the welded discs in two halves – split design. The split design enables maintenance crews to change

only the bottom half disc which is subjected to wear and tear as opposed to changing the entire disc (*double the expense*) for a non split design as required for the bicycle chain design.

- » The Luxme design keeps the entire drive assembly mechanism fixed but the idler tension assembly automatically tensions the entire length of chain continuously during operation in order to compensate for increase in tension due to friction, more productive flow, variation in atmospheric temperature or product temperature, chain wear and tear, disc wear and tear, etc. The automatic tension design is absolutely important to maintain minimum wear and tear in disc, chain, and pipe. Also zero tension is maintained in the chain return line
- » The Luxme Link Chain design arrangement acts as a universal joint during motion and can turn in multiple directions and different planes.
- » **Food Grade Applications** – For wash down requirements, food and pharmaceutical hygienic applications our recommendation is our standard supply of chain, UHMW discs moulded as an integral part of the continuous polished SS-316 link chain. Twice the disc life could be achieved by twisting the chain 90°.
- » If the product is free flowing, moulded discs on polished chain do not require any external cleaning methods, such as the use of brush assemblies, as there are no product hang-up points.

FIG. 3 - LUXME LINK CHAIN DESIGN

