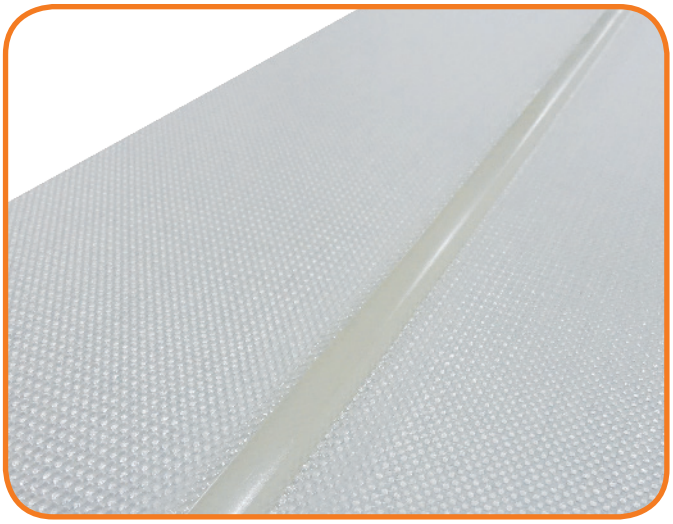
V-Guided Belt Tracking White Paper

Dorner

Belt tracking issues are some of the fastest ways to shut down a conveyor system. If a belt isn't tracking properly, it will run along the edge of the conveyor frame and start becoming frayed, leading to premature belt failure. And, if you don't have a spare belt on hand, your line could be shut down indefinitely until a replacement belt is obtained.

The answer, of course, is to reduce belt tracking issues from ever occurring in the first place, and there's no better design to accomplish that than with V-guided belts. Dorner has pioneered the technology behind V-guided belts as they've been used successfully in thousands of applications throughout numerous industries. V-guide tracking also stacks up well against crown roller tracking, which is another type of conveyor tracking. For proven performance and consistent belt tracking, V-guided belts are a great solution.



The Science of V-Guided Belting

Proper conveyor tracking starts with a professionally designed and well-built conveyor. The conveyor needs to be engineered to tight, true, precise tolerances to withstand demanding 24/7 operation that many companies are demanding of their equipment today.

V-guide tracking isn't the one-and-only solution for tracking, and won't cure tracking issues on a poorly built conveyor. Rather, V-guide is another tool in the conveyor designer's arsenal to help maintain accurate guiding of the belt.

The science behind V-guided tracking involves a V-shaped grove manufactured into the conveyor's end roller and bed plate. A polyurethane or PVC strip is attached to the underside of the belt and slides perfectly in the V-shaped groove to provide consisting belt tracking throughout the length of the conveyor.

The manner in which the V-guided polyurethane or PVC strip is attached can make a difference in the overall integrity of the belt. V-guided belts tend to be stronger when the strip is applied before the belt is made. Many manufacturers opt to cut fingers into the belt, splice it together, and then flip it upside down to apply the V-guide strip.

The problem with this process is that it leads to two potential failure points: the splice and the V-guide splice. By applying it prior to making the belt, the V-guide strip maintains its integrity for a seamless guide on the belt.

For best bonding results, the V-guide material should be the same as the belt used. But not all belts are receptive to V-guided design. Teflon, polypropylene and silicon-based belts are typically used in very specific applications, such as high heat or food-orientated uses, which don't interact well with the chemical composition and bonding agents between the V-guided material and belt.

Regulatory Concerns

Depending on the type of RTE product, the manufacturing operation will be subject to either USDA or FDA regulations. Facilities must be registered and they are subject to inspection to ensure they comply with the regulations for their type of facility.

Other 3rd party agencies that will have an influence of the design requirements include NSF and third party inspection agencies. There are several 3rd party agencies that have similar - but not identical – guidelines and standards for production. The customers of the manufacturer may require certificates of compliance or inspection documenting compliance with SQF, GFSI, BRC, or AIB standards.

From a food safety standpoint the two principal concerns are preventing microbial contamination and ingredient cross contamination that can result in undeclared allergens in a product.

V-Guide Advantages

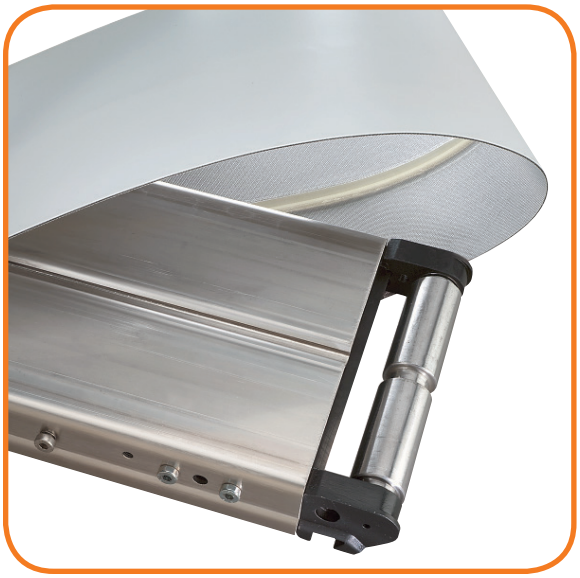
It's easy to see how V-guided belting works to maintain proper belt tracking. The V-guide groove cut into the bed plate acts as a track for the V-guide strip to provide side-to-side tracking of the belt along the entire length of the conveyor. Other performance advantages include:

Accommodating tight frame width-to-belt dimensions. The fit between the V-guide and V-groove in the end roller is close, generally a 1/16" gap. This provides tight control of the belt and control of belt drift.

Robust tracking method. A V-guided belt riding in a grooved end roller is a positive engagement system. It takes severe misalignment to drive the V-guide out of the groove.

Multiple traction surface options. The drive roller in a V-guided application remains flat, which means the belt maintains grip and traction, even if the belt is lagging, knurling or grooving.

Transfer for small or odd-shaped product. The straight, V-guided conveyor provides a consistent and level surface for transfer of small or odd-shaped products.



It is worth noting that V-guided belts do have drawbacks, albeit minimal ones. In addition to limitations on belt styles, the V-guided belt is not completely flat. Heat is applied during the application of the V-guided strip, which can result in slight raised deformation of less than 0.010." This deformation is evident in the flat portion of the conveyor, which could cause issue while moving very light or flimsy products that don't sit flat on the belt surface. A good solution for securing lightweight parts to a belt are vacuum conveyors. These conveyors use a perforated belt to draw air through groves in the conveyor bedplate to hold parts firmly to the belt.

Crowned Roller Belt Tracking

Crowned roller drive conveyors work by using a pulley that's slightly arched or "crowned" to help track the belt to remain centered on the roller, and thus run straight around the frame. While many types of belt materials can be used, the problem with crowned roller drive tracking is that there is no control over the belt on the conveyor bed. Crowned roller belt tracking is only done at the end rollers of the conveyor. Therefore, the belt in the center of the conveyor is not controlled and free to move side-to-side.

The side motion leads to excessive belt drift, which causes conveyor frames to be much wider than the belt. On larger rollers, a drift of ±1/2" can be expected. This means the conveyor needs to larger than what's required for the application, assuming a larger footprint and taking up more floorspace than necessary.

Due to the physics behind crowned roller belt tracking, the load capacity of the conveyor is limited, and calculated based on the size of the conveyor. Also, since the end pulley is slightly crowned, the belt doesn't lay flat as it rolls over the pulley. This can cause smaller or oddly-shaped products to be unstable, making transfers difficult.

Conclusion

V-guided belt tracking offers more control and higher reliability in conveyor performance than crowned roller drive. Chances are V-guided belt tracking can be a good fit for your application. To find out, contact your local distributor, visit www.dornerconveyors.com, or call 800-397-8664.