

# **SLASHING BOTTOM LINE COST OF LOW PROFILE CONVEYORS**

**(1" – 2" PULLEY DIA. - 24" MAXIMUM WIDTH)**

A recent survey on conveyors conducted by a major publication, indicated an over-whelming interest in system "Conveyor Dependability". Maintenance cost, ease of maintenance, uptime, and reliability, were of concern by over (97%) of those responding. It was also indicated that (54%) are willing to pay more for increased reliability.

This overwhelming response may be partially attributable to "Wishful Thinking" about reducing down-time for belt, pulley and bearing replacements, caused by vee-guided belts, abrasive pulley knurling, and reduced pulley diameters. The best method to avoid these crippling costs, is to avoid the cause.

Low Profile Conveyors are playing and increasing roll in many Automated Production Systems. Transferring products through manufacturing, assembly, and packaging lines, they perform a critical roll in determining production, and profit. Well designed, units should normally provide five to eight years of service before replacement of any mechanical conveyor component is required. To achieve this service life, we should review critical areas that can have a major influence on production, and maintenance costs. Productive life between maintenance downtime can be increased ten fold or more, with proper selection. We should keep in mind, that the "Operational Efficiency of the System" can determine, the success or failure of the total project, as well as influence all of those involved.

Pulley diameter is the most critical aspect of these conveyors, and plays a major role in "Service Life" of both the conveyor and belting. Pulleys below 35mm diameter may limit selection of durable belting with a high flex life. Smaller pulley diameters will normally always result in lower belt fatigue life, regardless of the belting used. The smaller pulley must also rotate at a higher R.P.M. to match the equivalent belt speed of a slightly larger pulley. This increased R.P.M. will decrease bearing, and drive life. Smaller pulleys also restrict bearing size and lubricant capacity, since most Low Profile Conveyors require the bearings to have a diameter less than the pulley. Defective bearing mounting systems that permit bearing outer race rotation within the mount, or impose localized clamping loads on the outer race, should be avoided, since they can damage the mounting component, as well as the bearing.

The net result of smaller pulleys and bearings is that they may not sustain the belt tension required for superior wear-free automatic crowned pulley tracking. To

off-set this, Vee-Guiding is sometimes utilized, however, it is not normally recommended as the primary tracking means by belting manufacturers, due to its high wear rate, and reduced pulley strength. Teflon™, polypropylene, and silicone based belts cannot normally use Vee-Guides. The reduced belt tension associated with some Vee-Guided systems, may result in the use of a sharp knurl on the drive pulley to provide ample gripping of the belt to pulley. This can create abrasion of the belt, causing the knurl recesses to become compacted with belt residue, resulting in eventual belt slippage and wear. This necessitates removing the belt, and cleaning the compacted belt residue from the pulley knurl, **(REQUIRING SEVERAL HOURS OF LOST PRODUCTION)**. After repeating this “**LOST PRODUCTION**” procedure on numerous occasions, the pulley it-self must be replaced due to the knurl being worn to the extent that it will no longer prevent slippage, this can consume **(ANOTHER TWO – FOUR HOURS OF LOST PRODUCTION)**. Knurling is a poor substitute for adequate belt tension, and should be avoided, especially in frequent start / stop operations, higher speeds, inclines, and heavier loads, since these functions will accelerate both knurl and belt wear.

Lack of Belt Manufacturer’s recommended belt tension can also reduce “Useable Belt Life” by inducing “Belt Elongation” beyond the conveyors tensioning range. Many belts with remaining service life are discarded due to belt elongation caused by tension limitation of the conveyor.

Use of internal drive systems totally enclosed with the control unit in a “Belt Blanket” could cost an hour or more of “**LOST PRODUCTION**”, merely to check for a loose connection, or a defective component, if the belt must be displaced to provide access. Drive life may also be reduced by higher temperature, and lower drive capacity. Use of this style conveyor should be cautiously reviewed.

Use of full cantilever stands, or mounts and swing-up tail, can allow belt removal, and replacement fully tensioned, and tracked, in thirty seconds, by one individual without tools. Proper belt tension in conjunction with correct bearing, and pulley sizing, permits higher loads, wear free crowned tracking, expanded belt life, elimination of abrasive pulley knurling, and excessive belt elongation. Properly designed systems have operated eight to ten years without having replaced any conveyor components, including the belt, in some instances.

Critical components such as bearings, pulleys, and belting still plague many Low Profile Conveyor Systems. Reviewing maintenance, or purchasing records can assist in identifying these critical areas. **THE BEST WAY TO REDUCE COSTS AND IMPROVE PRODUCTION IS NOT BY ROUTINE REPLACEMENT OF DEFECTIVE COMPONENTS, BUT TO ELIMINATE THE DEFECTS.** Based on some manufacturer’s current service recommendations, conveyors with minimum

diameter pulleys, and bearings, knurled pulleys, limited lubrication, bearing housings subject to wear, and reliance on only Vee-Belt Guiding, **CAN BE EXPECTED TO RELY ON ROUTINE REPLACEMENT OF MAJOR CONVEYOR COMPONENTS, AND BELTING. THESE SYSTEMS WOULD ALSO EXHIBIT GREATLY REDUCED PRODUCTION EFFICIENCY, INCREASED MAINTENANCE, AND LOWER R.O.I.**

Spending a little time to review these issues now, can result in major reductions in Down Time, replacement part costs, along with maintenance, and Most Important **EXPANDED PRODUCTION EFFICIENCY RATES, AND IMPROVED DELIVERIES**, resulting in greatly increased R.O.I.