

Is Lock-Out, Tag-Out Enough?



CEMA ACCESSORY COMMITTEE

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Lock-out, tag-out procedures are designed to bring a system to a state of zero potential and kinetic energy. The conveyor belt often stores potential energy in the form of belt stretch or bulk material on an inclined or declined section of the belt, even after the conveyor has been de-energized and theoretically can't move. This stored potential energy can present a serious hazard to workers performing common maintenance such as splicing the belt or cleaning around pulleys. Unfortunately, serious accidents occur every year from conveyor systems that we thought to be brought to a state of zero energy.

It is common practice to lift the counter weight in an attempt to relieve the belt stretch but this may not be sufficient to solve the problem. When the belt is cut for splicing or the jam is cleared the belt may move in an unpredictable direction if it is not blocked from the potential motion. For example, a belt with 100 m centers capable of 2% elastic stretch could unexpectedly move 2 m when released. Best practice is to clamp the belt on both sides of the repair or cleaning operation. This can be considered too time consuming and is often either not done or done inadequately in the name of getting back into production as soon as possible. CEMA states:

“Brakes and backstops should never be used as the only method of holding a belt during maintenance or cleaning. If working on a belt at or near pinch points make sure the potential energy of the belt and load has been neutralized with belt clamps or other suitable means.”

“...belt Clamps or other suitable means” is often taken to mean using homemade belt clamps with come-a-longs attached to idler bases or using a wire rope choker to block the belt movement. With these approaches, there is no way to tell if the holding power is adequate for the job. Several CEMA members manufacture engineered belt clamps that have specific working ranges. Proper belt clamping requires knowledge of the possible belt tensions, selecting correctly engineered belt clamps and anchoring the belt clamps to structural members capable of resisting the belt forces.

Because of the latent energy hazard of stored energy from the elevated load or belt stretch, conveyors pose unique hazards to workers. It is recommended in addition to lock-out, tag-out that blocking belt with engineered belt clamps and then testing the conveyor by trying to start it be added to routine job procedures.

CEMA's **7th ed. Belt Conveyors for Bulk Materials**, is available in their **e-commerce store**, available in hard copy or pdf. For additional information on Safety, go to **CEMA's website**.



Figure 1. In addition to lock-out, tag-out, blocking the belt with engineered clamps and then confirming the conveyor cannot start is considered best practice.

¹Pg. 619, Belt Conveyors for Bulk Materials 7th ed., ©Conveyor Equipment Manufacturers Association 2014.

For Additional information on Safety, go to CEMAs website.