



SMOOTH RUNNING VS. VIBRATION

Smooth running requirements for a belt are related to a need for minimum vibration in a piece of machinery. But these are two separate subjects.

Vibration is a condition of a drive. It can exist in either the machinery, or the belts, or both. It shows up in various ways: Movement of machinery, noise, marks on precision work, or instability of belts. Vibration is a result of misdirected forces.

Smooth running is a property of a belt. It is an indication of the degree of irregularity in that belt. Lack of smooth running qualities in a belt can be a cause of vibration in a machine or a belt.

Vibration in belt driven machinery is caused by forces on the system which fluctuate in a regularly recurring pattern. Origins of these forces can be separated into three categories:

1. Periodic torque fluctuations at the driveR or driveN shafts.

Torque fluctuations can come from many sources, such as compressors or internal combustion engines.

2. Irregularities in machine elements.

This includes such things as unbalance of rotors, shafts; flat spots on shafts; worn or misaligned bearings.

3. Irregularities in drive components.

This includes such things as eccentricity or wobble of pulleys; bore eccentricity; unbalance of pulleys; sheave grooves with non-uniform top width (in any one groove).

Also, this category includes a belt that is not smooth running.

For V-Belts we have specific test procedures and standards to measure center distance change (CDC), sometimes referred to as center distance variation (CDV). These will classify a V-belts smooth running properties as measured in V-sheaves. Similar standards do not exist for synchronous belts, but irregularities in the belt can cause similar vibration problems. In the case of synchronous belts, the natural frequency of tooth meshing can also cause vibration problems, and this can be compounded by inappropriate design, improper tensioning and misalignment.