Static Conductive Belts

Under certain operating conditions, a belt drive may generate static electricity. This poses a risk with belt drives used in the presence of potentially explosive gases, liquids, powders, dusts, etc., where the possibility of static sparks must be kept to a minimum. Static discharge can also interfere with sensitive electronic circuitry, radios and controls. Belts can be manufactured with materials that facilitate a grounding path for static electricity. It is common in the industry to refer to such belts as “static conductive.” It is important to note that all components of the drive must be conductive to establish a clear grounding path to dissipate any static charge.

For non-synchronous power transmission belting, Veyance Technologies Inc. references the Association of Rubber Products Manufacturers (ARPM) Bulletin IP-3-3, which limits the maximum resistance for static conductive belts to six mega-ohms when an electrical potential of 500 volts is applied to a clean, dry surface of the belt through electrodes spaced 8.5 inches apart. A belt with a measured resistance greater than six mega-ohms is considered non-conductive.

For synchronous power transmission belting, the reference document is ISO standard 9563, which describes a test procedure and fixture specific to synchronous belting, where the electrodes are machined to match the specific tooth profile of the belt. The maximum allowable resistance, measured with an applied potential of 500 Volts, is calculated as follows:

\[
R = \frac{6 \times 10^5 L}{w}
\]

Where

- \( R \) = resistance in ohms
- \( L \) = distance between electrodes
- \( w \) = width of the belt

Drive conditions and service variables in combination with time in operation can result in a loss of static conductivity. It is recommended that a conductivity check be added to drive preventative maintenance programs where belt static conductivity is a requirement.