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BELTS BY TIMKEN

TECHTIPS

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Oil and Chemical Resistance of V-Belts

The presence of oil or chemicals in contact with a belt drive system can materially influence the life span and operational characteristics of the system. The concentration of the chemical or the oil involved, length and type of exposure, choice of the belt type used, and environmental conditions such as heat and humidity, all contribute to the rate and degree of impact on the performance and deterioration.

Two effects may be noted when belts are exposed to oil and/or chemicals. The most obvious is a swelling or increase in dimensions of the cross section so that they no longer fit the sheave or pulley groove properly. Less apparent at casual observation, is the deterioration of the original physical properties, which includes adhesion between the belt components. If the degree of swelling and/or loss of physical properties is significant, the life of the belt will be substantially shortened.

The above effects may be brought about by a large variety of chemicals, notably oils, acids and solvents.

No singular synthetic rubber is resistant to all of these. Some rubber compounds react favorably to one chemical, but poor with another, and only adequately with still another.

Because of this, all stock belts manufactured by members of the Association for Rubber Products Manufacturers (ARPM) are constructed to be reasonably resistant to oil and chemicals. The nature of the compounds and/or belt construction may minimize swelling and deterioration. Occasional oil or grease splatter does not usually adversely affect standard belts.

In addition, there are many substances, such as gasoline, which swell rubber or extract ingredients from the belt rubber compounds. These may cause the belt to become brittle, crack or swell, which results in deterioration of performance.

Identifying the numerous materials that may deteriorate belts would be impractical and requires chemistry-specific knowledge of each material. Proprietary formulations used by petroleum and chemical manufacturers would further complicate this effort. Ultimately, a careful laboratory study would be required to test the impact of specific materials on belt performance and deterioration.

Belt compounds also vary from manufacturer to manufacturer. Usually, those which are specified as oil resistant will withstand moderate attack from most commonly used oils and solvents. If the drive is subjected to an accumulation of a considerable amount of oil and grease on the belt, it may preclude the use of a v-belt or a v-ribbed belt.

Unlike v-belts, synchronous belts are not substantially affected by the loss of friction coefficient and are capable of operation under these conditions. Depending on the drive and the nature of the oil, it may be possible to use a synchronous belt submerged in oil. Consult Timken Belts for recommendations.

As indicated above, many variables must be considered when evaluating the impact of oil and chemicals on belt drive performance.

The following general guidelines might be of use in selecting a belt drive system subjected to a chemical environment.

1. Prevent the accumulation of contaminants on the drive.
2. If the belts are to be subjected to only occasional contamination contact, a standard construction v-belt or synchronous belt can be used.
3. If the belts are expected to give long, trouble-free operation on an industrial drive and they are in contact with oil or exposed to an atmosphere laden with chemicals or solvents, consult Timken Belts for recommendations.

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The Timken team applies their know-how to improve the reliability and performance of machinery in diverse markets worldwide. The company designs, makes and markets high-performance mechanical components, including bearings, belts, gears, chain, couplings and related mechanical power transmission products and services.

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