

HIGH TEMPERATURE SILICONE RUBBER TIMING BELTS

Polyurethane materials are typically limited to applications with a continuous temperature range of -30 °F to 180 °F and intermittent temperatures up to 250 °F. Above these temperatures, the polymer structure begins to break down and mechanical properties are adversely affected. Silicone rubber can be used as a substitute material in applications with temperatures up to 500 °F.

Silicone versus Polyurethane

Silicone rubber belts have the following advantages as compared to polyurethane belts:

- Excellent heat resistance and dimensional stability for both low and high durometer products
- Insensitive to oxidation and very stable which allows belts to function across a wide temperature range (-120 °F to 500 °F)
- Hydrolitically stable and unaffected by radiation
- Chemically resistant
- Low linear shrinkage (< 0.1%)
- Low thermal conductivity
- Volume resistivity of $(5.5 \times 10^{-4} \text{ g cal/cm}^2)$

Anti-Static Applications

In addition to standard silicone materials, anti-static formulations can be used which result in belts with electric dissipative properties to minimize static charge build-up. Contact the Engineering Department for specific applications.

Durometer Characteristics

Silicone belts used in power transmission applications can only be processed at Chemi-Flex with durometers up to 70 Shore A. RTV silicones can be used for friction drive applications with durometers as low as 12 Shore A. For applications where tooth strength is required with a softer backside for high coefficient of friction, dual durometer silicone belts are available.

Tooth Shear Properties

Silicone belts typically have lower tooth shear strength than polyurethane belts. Silicone rubber (especially higher durometers) exhibit pseudo plastic behavior even at low shear rates due to high filler concentration. A comparison of failure torque for silicone and polyurethane is shown in the table below:

Pitch Code		
Silicone Rubber Shore 40A 150XL-100 NK Belt (Ft-Lb)	Silicone Rubber Shore 70A 150XL-100 NK Belt (Ft-Lb)	Polyurethane Shore 85A 150XL-100 NK Belt (Ft-Lb)
10.0	13.5	30.0

Notes:

1) Failure torque is defined as the torque value applied to the belt which results in tooth shear.