

POLYURETHANE (PUR)

■ General

Polyurethane has become increasingly important in the cable industry. This material shows mechanical characteristics similar to rubber at certain temperatures. The combination of thermoplastic and elastic characteristics has led to the description TPE thermoplastic elastomere. Here at [BRÖCKSKES](#), we use PUR on a Polyether base as a jacketing material. In addition to standard Polyurethane, [BRÖCKSKES](#) has developed the following types of Polyurethane:

- ▶ Polyurethane silk (reduced adhesion)
- ▶ Polyurethane matt (rough surface, reduced adhesion)
- ▶ Polyurethane flame protected
- ▶ Polyurethane halogen free and flame protected

■ Mechanical characteristics

The insulation materials of the cables are not usually subject to high mechanical stress. The jackets on the other hand are heavily used. This is especially true for flexible control and connection cables which are often pulled over sharp corners and rough surfaces. This can lead to cuts which are magnified when the cable is stretched during flexible use. Compressive stress caused by crushing and impacting from tools and machines can also occur. The most important mechanical characteristics of Polyurethane are:

- ▶ high tensile strength
- ▶ high tear resistance
- ▶ notch resistance
- ▶ abrasion resistance
- ▶ alternate bending resistance
- ▶ impact resistance
- ▶ flexibility to cold conditions

■ Chemical characteristics

The chemical resistance depends on many factors such as chemical type, reaction time, temperature, volume, concentration and of course the type of Polyurethane used. In comparison with many other materials, such as rubber or PVC, Polyurethane has better resistance against chemical reaction. The outstanding chemical characteristics are:

- ▶ very good resistance against mineral oils
- ▶ good resistance against alcohol-free benzine
- ▶ good resistance during storage underwater
- ▶ good resistance against many solvents

The danger of decomposition through microbes exists with Polyurethane after prolonged exposure to dampness and warmth. The Polyurethane used by [BRÖCKSKES](#) is resistant to microbic decomposition. Etherpolyurethane and Esterpolyurethane can be differentiated by the saponification value (VZ).

Etherpolyurethane (resistant) - $VZ \leq 200$

Esterpolyurethane (non-resistant) - $VZ \geq 350$

After prolonged exposure to warm water or tropical climates, Polyester based Polyurethane will undergo a chemical reaction. The result is a weakening of mechanical strength. However, the Polyurethane that [BRÖCKSKES](#) uses is resistant to hydrological break-down.

Etherpolyurethane is weather and ozone resistant in all climates. Discoloration by sunlight is possible, but this will not affect performance.