

# Chemical structure

## Elastollan®

Elastollan® is essentially formed from the inter-reaction of three components:

1. polyols (long-chain diols)
2. diisocyanates
3. short-chain diols

The polyols and the short-chain diols react with the diisocyanates through polyaddition to form linear polyurethane. Flexible segments are created by the reaction of the polyol with the diisocyanate. The combination of diisocyanate with short-chain diol produces the rigid component (rigid segment). Fig. 1 shows in diagrammatic form the chain structure of thermoplastic polyurethane.

The properties of Elastollan® grades depend on the nature of the raw materials, the reaction conditions, and the ratio of the starting materials. The polyols used have a significant influence on certain properties of the thermoplastic polyurethane. Either polyester-based polyols or polyether-based polyols are used in the production of Elastollan®.

The products are distinguished by the following characteristic features:

Using polyester polyols:

- highest mechanical properties
- highest heat resistance
- highest resistance to mineral oils

Using polyether polyols:

- highest hydrolysis resistance
- best low-temperature flexibility
- resistance to microbiological degradation

In addition to the basic components described above, many Elastollan® formulations contain additives to facilitate production and processability. Further additives can also be included to modify specific properties. Such additives include mold release agents, flame retardants, UV-stabilizers and plasticizers as well as glass fibers to increase rigidity.

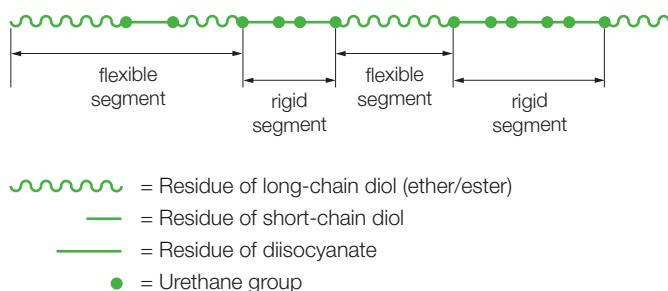


Fig. 1: Structure of thermoplastic polyurethane