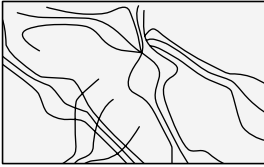
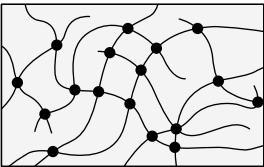


Thermoplastics – Elastomers - Thermoplastic Elastomers (TPE)



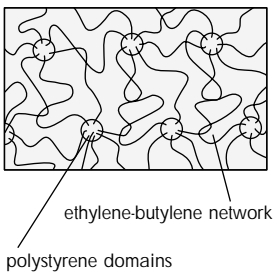
Thermoplastics

- ▶ become free-flowing and shapeable under application of heat and shear force
- ▶ resolidify when cooled
- ▶ purely physical process without chemical transformation or crosslinking
- ▶ thermoforming process is reversible, i.e. can be repeated



Elastomers

- ▶ initially deformable, can be crosslinked under application of heat
- ▶ crosslinking is a chemical process involving bonding of neighbouring molecular chains
- ▶ after crosslinking have elastic properties (high resistance to heat and mechanical stress)
- ▶ crosslinking is irreversible, i.e. material cannot be reshaped by repeated heating



Thermoplastic Elastomers

Based on styrene block copolymers (for example SEBS)

- ▶ under application of heat and shear force, become free-flowing and shapeable
- ▶ molecules are made up of thermoplastic polystyrene end blocks and elastic ethylene-butylene mid-blocks
- ▶ on cooling, physical crosslinks (polystyrene domains) are formed which connect the elastic ethylene-butylene blocks, creating a fixed three-dimensional network
- ▶ as a result, the elastic properties of TPE's are comparable with those of chemically crosslinked elastomers
- ▶ thermoforming process is reversible, allowing problem-free reutilisation of production scrap without impairing mechanical property levels (see Point 2 "Recycling" in section entitled "Important Additional Information").