

What is the difference between thermoplastic polyurethanes and hot casting?



The difference between thermoplastic polyurethanes and hot casting lies in the better yield of the latter in terms of elasticity and superior physical-chemical properties: hot casting or casting polyurethanes have, in fact, better performances such as abrasion resistance, resistance to torsion and tearing and elongation at break.

Both thermoplastic polyurethanes and hot casting polyurethanes are included in the category of compact polyurethanes.

The difference between thermoplastic polyurethanes and hot casting polyurethanes is also linked to the production process.

Difference between thermoplastic polyurethanes and hot casting:

The characteristics of thermoplastic polyurethane

Thermoplastic polyurethane has a reversible alteration of the physical state depending on the temperature. At 120°, it passes from solid to liquid state and, through extrusion systems such as RIM (Reaction Injection Mould), allows the production of numerous plastic products.

Despite its very high viscosity, thermoplastic polyurethane can be injected into a mould through dedicated machines capable of working at very high temperatures.

Cooling inside the moulds, thermoplastic polyurethane can take any shape.

The disadvantage of thermoplastic polyurethane is its poor chemical-physical properties compared to hot casting polyurethane, especially with respect to the "elasticity" factor.



The characteristics of hot casting polyurethane

The hot casting polyurethane is produced with machines working at low pressure and is cast in dedicated moulds heated to a temperature of about 100°.

The products made with hot casting technology, during the polymerization process, go from liquid to solid state in an irreversible way, thus ensuring maximum mechanical performance compared to thermoplastic polyurethane.

Products made with the hot casting system can also take any shape, but they ensure superior reliability and resistance by virtue of the process used.

The ideal use of hot casting polyurethane is the replacement of certain types of rubber, steel and different types of plastic materials.

Reduction of mechanical properties in hot casting polyurethane

The reduction in hardness and mechanical properties, also called "pseudo-thermoplasticity", can also occur in products obtained with some hot casting polyurethanes.

However, it is not necessarily a disadvantage, if the temperature threshold where the phenomenon occurs is lower than the temperature inside the system where the piece will be installed.

In reality, any hot casting polyurethane has its own innate thermoplasticity. Usually, good quality polyurethanes have a slight reduction in physical properties around 120°C, while above 150°C the hardness and the various mechanical properties drop drastically.

In cases where a product has to work constantly at temperatures around 150°C, special polyurethanes with exceptional dynamic properties formulated with exclusive and very expensive raw materials are used.