

TPU FOR FOOTWEAR AND COMPOUNDS

EPAFLEX was established as a system house specialised in producing polyurethane systems for the footwear industry.

This tradition and vocation is reflected in the line of thermoplastic polyurethanes (TPU) designed and developed specifically for the footwear and compound industry.

The thermoplastic polyurethanes manufactured by Epaflex are not only characterised by the particularity of the TPU, (wide range of hardness, flexibility and elasticity, resistance to oils, to fuels, to solvents and to chemical products), but also by a unique combination of properties, because they blend grip and rubbery hand to very low values of loss by abrasion and high values of tear resistance.

The thermoplastic polyurethanes manufactured by Epaflex are, therefore, the materials which bridge the gap of characteristics between rubbers and common thermoplastic materials as well as offering excellent compatibility with numerous technopolymers and rubber.

ISO 9001 certification provides a further guarantee of the excellence of our processes.

The product lines designed for footwear and compounds are **EPAMOULD series 100 (polyester base)**
series 600 (polyester base)
series 700 (polyether base)
whose main characteristics are:



Soles for safety shoes:

- Excellent adhesion to the PU
- Good resistance to oils and fats
- Good shear strength
- Excellent slip resistance (HFC)
- Availability of antistatic and ESD products

Soles and inserts for sports shoes

- Excellent flexibility even at the lowest temperatures
- Optimised TPU for perfect adhesion with medium hardness products (inserts)
- Quick cycle times
- Excellent dimensional stability
- Outstanding scratch resistance

Soles for high fashion shoes

- Excellent resistance to yellowing
- Excellent definition of the mould design
- Excellent softness and rubbery hand
- Easy moulding in several colours
- Absence of blooming effect

Soles for casual shoes

- Excellent sticking properties
- Excellent slip resistance
- Quick cycle times
- Excellent dimensional stability
- Easy moulding in several colours
- Absence of blooming effect

PRE-TREATMENT

TPU is a hygroscopic polymer and the moisture absorbed affects its processability and the physical-mechanical properties of the moulded articles.

The granules must be dried before use by using fan ovens, vacuum driers or dehumidifying air driers.

The percentage of moisture in the granule must be less than 0.05%.

Like TPU, any masterbatches should also be dried separately before being mixed. For the drying parameters (time and temperature) please see our technical datasheets. The exposure of the TPU to the air for even just a few hours means moisture absorption and forces pre-drying once again.

STORAGE

Epaflex TPUs must be stored in a dry place at a room temperature preferably around 20° C and in any case not at a too high or too low temperature preferably in a ventilated, cool room.

PACKAGING

Epaflex TPUs come in various packaging such as: 25 kg aluminized or vacuum bags and 600 kg. or 1000 kg. octabins.

COLOURATION

Epaflex TPUs can be coloured with masterbatches.

Specific TPU-based masterbatches are recommended.

Like TPU, masterbatches should also be dried separately from the TPU before being mixed with it.

RECYCLING

Processing waste and scraps can be re-used after having been re-granulated. In this case, it is worth checking the absence of impurities and ensuring that the product has not undergone heat degradation.

The re-granulated product (like virgin TPU) should always be dried before being re-used.

We suggest using re-granulated TPU blended with fresh granules at a percentage of no more than 25%.

TECHNOLOGY

Machines with a clamping pressure of no less than 150 tons and injectors with three-stage screws of a diameter between 40 and 60 mm, and an L/D ratio between 20:1 and 30:1 are recommended for injection moulding.

The use of screws with a diameter exceeding 65 mm and/or with a high compression ratio is not recommended.

In order to avoid thermal degradation of the product (local overheating of the material), it is essential to eliminate all the possible points where stagnation may occur and check that the nozzle is heated in a uniform manner for its whole length.



EPAFLEX was established in 1991 as a system house specialised in producing polyurethane systems for the footwear industry.

Over the years, Epaflex's business has expanded further and diversified, first with the second line of products, Thermoplastic polyurethane (TPU) granules and then with the production of Polyurea, Polyaspartic Polyureas, Prepolymers and Sprays Foams for insulation.

Along with Elachem S.p.A., Epaflex belongs to an industrial group that recently completed an important chemical plant for resin production.

All the polyesters used in Epaflex TPU are manufactured in Elachem so that the quality of the raw material can be carefully controlled, giving it a suitable level of competitiveness for the market needs.

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