

Technical Data Sheet

Thermoplastic polyurethane NF-650.

TPU NF-650 is high-quality polyurethane elastomer based on polyester, normally used to make the soles and components of casual, special, model and children's shoes

- Provide cold-flex resistance of soles
- Excellent surface pattern
- Could be recycled

NF-650 is designed to produce the outsole of sport, casual and the model footwear

Physical-mechanical properties

Property	Method	Value
Density, gr/cm ³	DIN 53479	1,18
Hardness, Shore A	DIN 53505	65
Tensile strength, MPa	DIN 53504	20
Elongation at break, %	DIN 53504	700
Cold-flex resistance, @ -10C, k.cycles	DIN 132	250
Abrasion resistance, mm ³	DIN 53516	60

Processing recommendations

For optimal processing and receiving of high-quality thermoplastic polyurethane it is recommended to dry material preliminary at 80C within 2 hours at desiccant dryer. Standard machines with 3 stage polyethylene type screws are the most suitable for processing of thermoplastic polyurethanes. It is not recommended to use nylon screws or screws with short compression zone. To avoid damaging of screw cutters, chamber should be strong with circular or trapezoidal sections. Gating should be as large as possible with a relatively short length.

Total shrinkage is a result of molding shrinkage and post -shrinkage which occurs not only during annealing, but also during longer- time storage of the parts.

Packaging and storage

TPU NF is supplied pre-dried in 20 kg moisture guarded sacks (40 per pallet, covered with plastic film).

Shelf life of products under recommended conditions in sealed containers: 24 months from date of manufacture.

Machine specifications

- Profile: 45% Feed zone, 35% Compression zone, 20% Metering zone
- Compression ratio ~ 2.0 up to 2.1:1
- Check ring
- High injection pressure > 600 Bar at nozzle
- Back pressure up to 80 Bar
- Multiple injection speed (at least two speeds)
- Adjustment of injector height and translation

Temperature control

- Barrel and nozzle temperature adjustments up to 250°C
- Precise temperature control
- Recommended mould temperature: 45-50°C

	NF-650
Recommended screw diameter	40-120 mm
L/D ratio	20-25:1
Compression ratio	2.0-3.0:1
3 stage design:	
- Feed zone	0.4L
- Compression zone	0.3L
- Metering zone	0.3L
Screw rotation speed	20-80 rpm
Injection pressure	20-100 Bar
Secondary pressure	10-50 Bar
Back pressure	0.3-3 Bar
Injection speed	"as slow as possible"
Mould temperature, °C	25-50
Temperature profile	
Feed zone, °C	25-35
Rear zone, °C	175-185
Centre zone, °C	180-190
Front zone, °C	185-195
Nozzle zone, °C	180-190

Health and safety

Before processing or any other actions with material, all personnel should be well aware about safe handling with thermoplastic polyurethane. Production facilities where thermoplastic polyurethane is processed should be equipped with continuously operating forced ventilation.

NF-650 is not explosive, not flammable spontaneously. Extinguishing: Powder-type fire extinguishers, foam fire extinguisher, do not use water jet. Products of processed thermoplastic polyurethane have no adverse effect on human health.

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