

WE'RE BY YOUR SIDE FOR TPU MOULDING

Thermoplastic polyurethane is an innovative technical material with characteristics which make it suitable for many applications in the plastics industry. Technical injection moulding is one of the most widely used and varied applications in which Epaflex TPU products find their natural habitat thanks to their versatility and range of use.

Epaflex produces TPU products which guarantee constant quality and ease of processing which meet the needs of the most complex and state-of-the-art applications. In addition to the traditional features of TPU such as the wide spectrum of hardness, flexibility and elasticity, resistance to oils and greases, to combustible substances, solvents and chemical products and its well documented resistance to abrasion, there are also other properties which are particularly important for moulding.

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

The product lines designed for technical injection moulding are **EPAMOULD series 200 (polyester base)** **series 700 (polyether base)** whose main characteristics are:

Epaflex TPU is used in the following fields:



- Excellent flexibility even at very low temperatures
- High hydrolysis resistance
- High resistance to microbial attack
- Excellent tensile and tear strength
- High impact resistance
- Compatibility with other materials
- Quick cycle times
- Ease of extraction
- Excellent dimensional stability
- High resistance to yellowing
- Excellent definition of mould design
- Easy moulding in many colours
- Excellent scratch resistance
- Absence of plasticizers
- Good acoustic insulating properties
- Excellent vibration absorbing properties
- Recyclability

- Mechanical items
- Industrial components
- The mining industry
- Consumables
- Wheels, rollers
- Transmissions
- Transport
- Agriculture and gardening
- Automotive components

EPAMOULD technical injection moulding series

W W W . E P A F L E X . I T

TYPICAL PROPERTIES	Method	Unit	POLYESTER										POLYETHER											
			280 A 56	265 A 56	273 A 10	283A 10	290 A 10	292 A 30	295 A 10	295 A 83W	290 D 12	295 D 12	290 D 12	295 D 12	290 D 12	295 D 12	274 D 12	270 A 26	280 A 15	285 A 15	295 A 15	295 D 15	280 D 15	
Density	ISO 1183	g/cm ³	1,18	1,18	1,18	1,18	1,18	1,18	1,18	1,18	1,18	1,18	1,18	1,18	1,18	1,18	1,13	1,13	1,13	1,13	1,14	1,15	1,15	
Hardness Sh A	ISO 868	Shore A	63	67	76	85	92	94	94	94	94	94	94	94	94	94	86	86	86	86	94	94	94	
Hardness Sh D	ISO 868	Shore D						45	44	44	45	44	44	44	44	44	55	55	55	55	64	64	64	60
Tensile strenght	EN 12803	MPa	28,0	30,0	36,0	45,0	48,0	50,0	50,0	55,0	55,0	55,0	55,0	55,0	55,0	55,0	48,0	48,0	48,0	48,0	50,0	50,0	45,0	45,0
Stress @ 100% elongation	EN 12803	MPa	2,7	2,8	3,3	4,4	7,0	8,5	7,8	7,8	7,8	7,8	7,8	7,8	7,8	7,8	10,0	12,0	12,0	12,0	17,0	17,0	25,0	25,0
Elongation at break	EN 12803	%	750	700	650	590	580	450	520	540	540	540	540	540	540	540	390	390	390	390	390	390	350	350
Tear strenght	ISO 34	KN/m	75	53	75	100	120	130	130	130	130	130	130	130	130	125	128	128	128	128	150	150	200	200
Abrasion resistance	EN 12770	mm ³	45	30	30	30	30	30	30	30	30	30	30	30	30	35	35	35	35	35	40	40	40	40
Compression set 70h/23°C	ISO 815	%		15		29	27		25	20														
Compression set 22h/70° C	ISO 815	%		40		42	43		45	40														
Glass transition temperature (Tg)*	DMA	°C	-33	-32	-32	-33	-35	-35	-35	-33														
PROCESS																								
Injection molding			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Extrusion			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CHARACTERISTICS																								
Plasticized			•																					
Transparent					•																			
Opaque																								
Flame retardant																								
EC/FDA food contact approved																								

*(Maximum of "Loss modulus" curve in DMA)



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 granules 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 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.

COLOURING

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 for the presence 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 heat 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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POLYURETHANES spa

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