

## DO YOU EXTRUDE TPU? EPAFLEX IS YOUR IDEAL PARTNER

Thermoplastic polyurethane (TPU) granules are innovative technical materials with characteristics which make it suitable for several applications in the plastics industry.

One of these applications is that of extruded products. Epaflex's Epaline series includes products developed specifically for extrusion and calendaring. Whether they be belts, pipes, wires, cables, films or profiles, Epaflex has the product for you.

Epaflex produces TPU guaranteeing constant quality and ease of processing which is capable of satisfying the needs of the most complex and state-of-the-art applications.

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

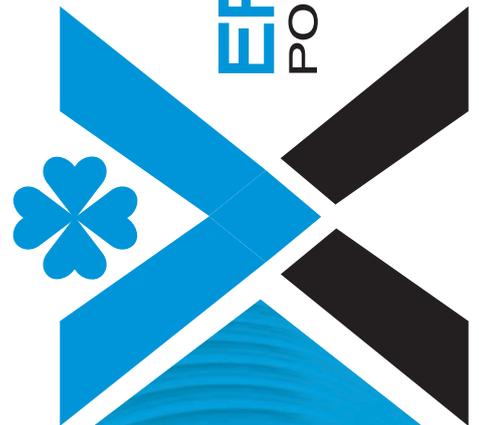
The product lines designed for extrusion are the **EPALINE series 300 (polyester base)** **series 700 (polyether base)** whose main characteristics are:

- Very good friction and scratch resistance
- High dimensional stability
- Good tensile, tear and shear strength
- High elasticity and flexibility
- Good resistance to oils, greases and many solvents
- Good resistance to low temperatures
- Absence of halogens
- Possibility of creating matt and glossy surfaces
- High process speed
- High hydrolysis resistance
- Availability of high flame resistance products
- Very good welding capacity
- Wide range of hardness
- Food approved grades
- Possibility of providing grades with tailored fluidity
- Recyclability



- 378 A 51 20
- 384 A 51 20
- 380 A 10 25
- 380 A 10 33
- 380 A 10 34
- 387 A 10 25
- 387 A 10 33
- 387 A 10 34
- 389 A 10 25
- 389 A 10 33
- 389 A 10 34
- 394 D 35 MPW
- 783 A 15 35
- 790 A 15 35
- 786 A 33
- 786 A 34
- 790 A 33
- 790 A 34

TYPICAL PROPERTIES	Method	Unit	POLYESTER												POLYETHER					
			378 A 51 20	384 A 51 20	380 A 10 25	380 A 10 33	380 A 10 34	387 A 10 25	387 A 10 33	387 A 10 34	389 A 10 25	389 A 10 33	389 A 10 34	394 D 35 MPW	783 A 15 35	790 A 15 35	786 A 33	786 A 34	790 A 33	790 A 34
Density	ISO 1183	g/cm <sup>3</sup>	1,18	1,18	1,18	1,18	1,18	1,18	1,18	1,18	1,18	1,18	1,18	1,14	1,14	1,14	1,14	1,14	1,14	1,14
Hardness Sh A	ISO 868	Shore A	78	86	81	82	83	83	86	87	87	87	87	85	90	86	87	87	91	91
Hardness Sh D	ISO 868	Shore D		46																
Tensile strength	EN 12803	MPa	48	50	45,0	40,0	38,0	50	50	45	42	52	57	40	45	30	28	38	33	33
Stress @ 100% elongation	EN 12803	MPa	4,5	6,0	4,5	4,2	4,0	7,2	7,2	6,5	6,2	7,5	14,0	7,0	8,0	5,0	4,8	7,2	7,0	7,0
Elongation at break	EN 12803	%	550	580	400	550	580	540	540	95	580	500	500	550	500	500	550	550	580	580
Tear strength	ISO 34	KN/m	125	115	120	90	85	120	120	95	90	115	160	100	105	75	50	95	85	85
Abrasion resistance	EN 12770	mm <sup>3</sup>	35	35	30	45	65	35	35	45	65	30	30	35	35	50	75	50	75	75
Compression set 70h/23°C	ISO 815																			
Set of compression: 22h/70° C	ISO 815																			
Glass transition temperature (Tg)*	DMA	°C	-28	-28	-25	-33		-35				-35	-20	-39						
<b>PROCESS</b>																				
Extrusion			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Calendering																				
<b>CHARACTERISTICS</b>																				
Transparent			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Opaque							•													
Flame retardant						V2	V0			V2	V0					V2	V0	V0	V2	V0
EC/FDA food contact approved			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•



**EPAFLEX**  
POLYURETHANES

## PRE-TREATMENT

TPU is a hygroscopic polymer and the moisture absorbed affects its processability and the physical-mechanical properties of the extruded/moluded 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 from the TPU 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 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

For transforming our extrusion grade TPU we recommend the use of standard 3-stage single-screw extruders with "general purpose" constant pitch screws (1 D) whose diameter is between 40 and 60 mm and L/D ratio between 20:1 and 30:1.

The compression ratio can range from 1:2 to 1:3.

In order to prevent the product from heat degradation the space between screw and cylinder must be between 0.1 and 0.2 mm and the dies used must be designed so that there are no areas in which the material can stagnate.

We discourage the use of perforated disks and packets of filters.



**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.

**EPAFLEX**   
**POLYURETHANES** spa

Via Circonvallazione Est, 8  
Tel. +39 0381 929 521  
Fax +39 0381 929 523  
27023 Cassolnovo - PV - Italia  
email: epaflex@epaflex.it

[WWW.EPAFLEX.IT](http://WWW.EPAFLEX.IT)

