PEARLTHANE® 12T92E

Thermoplastic Polyurethane Elastomer

PEARLTHANE® 12T92E is a special polyester-based TPU, supplied in form of translucent, colourless pellets, combining hardness with excellent processability and low temperature performance. This grade has been specially designed for mechanically demanding applications where excellent mechanical properties are required, such as timing belts.

TYPICAL PHYSICAL PROPERTIES

Physical Property	Test Method	Typical Values *
Density @ 20ºC	DIN 53.479	1.20 g/cm^3
Shore Hardness	DIN 53.505	91 A
Tensile Strength	DIN 53.504	39.5 MPa
Elongation @ Break	DIN 53.504	500 %
Modulus @ 100% Elongation	DIN 53.504	8 MPa
Modulus @ 300% Elongation	DIN 53.504	16.6 MPa
Tear Strength	DIN 53.515	112 kN/m
Abrasion Loss	DIN 53.516	30 mm^3
Compression Set *(70 h. @ 23ºC)*	ASTM D395B	26 %
Compression Set *(24 h. @ 70ºC)*	ASTM D395B	61 %
Moisture Content	MQSA 44	< 0.1 %
Melting Range *(MF=10)*	MQSA 111	183 – 193 ºC
Tg *(DSC, 10ºC / min)*	DIN 51.007	- 40 ºC

** These are typical values & should not be used for establishing specifications.*
*** Temperature at which MFI = 10 g/10 min @ 21.6 kg.*

WORKING INSTRUCTIONS

For optimum results, previous drying of the product during 1-2 hours at 100-110º C is advisable, in a hot air circulatory, vacuum or desiccant-air dryer.

EXTRUSION

In accordance with our experience, the characteristics of the extruder that is suitable for processing **PEARLTHANE® 12T92E** are the following:

1. L/D ratio between 25:1 and 30:1
2. The extruder screw must have 3 zones and a compression ratio in between 2:1 and 3:1 (Usually, the screws that are used for Polyethylene extrusion give good results).
3. The extruder screw should have a continuous regulation device and a working power higher than for processing other plastics.
4. The speed of the extruder should be low (12 to 60 rpm, depending on its diameter), so as to avoid material degradation due to shearing.

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Gran Vial, 17 08160 Montmeló, Spain Tel. (34) 93 572 11 00 Fax (34) 93 572 09 34
E-mail: info@merquinsa.com http://www.merquinsa.com
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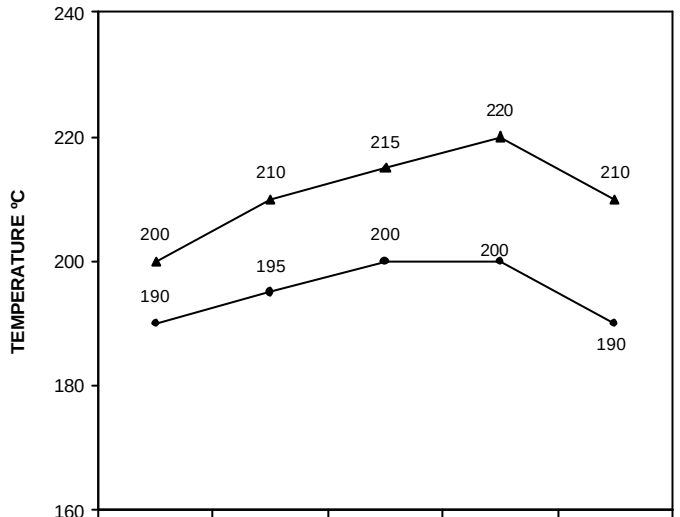
5. The filters used should be disks with holes of 1.5 to 5 mm. (depending on the screw and the die), and screen packs (the no. of meshes /cm^2 will depend on the end product which is processed), so as to create a pressure built-up.

The suggested processing-temperature profiles for film extrusion (flat films) are depicted in the figure below:



	1	2	3	4	DIE
PROFILE 12T92E/1	190	195	200	200	190
PROFILE 12T92E/2	200	210	215	220	210

EXTRUDER & CONDITIONS
TYPE.- 30/25D (L/D=25:1), COOLING.- Air, SCREW.- 3:1, SPEED.- 20-50 rpm.,
BREAKER PLATE.- --, FILTER PACK.- --, THICKNESS DIE.- 0,2 mm, PRE-DRYING.- 1 h @ 105 ºC

INJECTION MOULDING

Based on an injection moulding equipment with the following characteristics:

Closing force:	: 30 tons
Screw diameter:	: 26 mm
L/D ratio:	: 23
Maximum hydraulic pressure:	: 210 bar
Mould:	: Plaque 120x120x2 mm

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The suggested processing conditions are as follows:

INJECTION CONDITIONS			
Feed zone	195ºC	Injection pressure	85 bar
Compression zone	200ºC	Injection time	15 sec
Metering zone	210ºC	Holding pressure	50 bar
Nozzle	210ºC	Holding time	15 sec
Mould temperature	30ºC	Cooling time	20 sec

Screw speed: approx. 180 rpm.

APPLICATIONS

PEARLTHANE® 12T92E can be extruded into profiles, belts, tubes and film. In the case of injection moulding, this grade is only recommended for certain applications, e.g. when large, hard-to-fill mould cavities are used.

HEALTH AND SAFETY

A safety data sheet on **PEARLTHANE® 12T92E** is available, with all information related to safety.

PACKAGING

PEARLTHANE® 12T92E is packaged in heat-sealed, moisture proof multi–layer bags of 25 kg net weight made of PE/Aluminium/PE. Bags are shipped on pallets of 750 kg. Additionally, PE-lined cardboard gaylords of 700 kg net weight are available.

STORAGE

Material received from Merquinsa should be inspected to assure containers are not damaged during transportation before being stored prior to use.

PEARLTHANE® 12T92E should be kept in a cool (15-25ºC) and dry environment prior to being processed. Standard practice of consuming resin on first-in first-out basis should be employed.

For more information, please feel free to contact us at **www.merquinsa.com**

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