

ETERNALAST® LD4089A

Technical product information: AIR-BLOWN – TPU monolayer film properties

ETERNALAST® LD4089A is an **under-development polycarbonate-based TPU** for injection and extrusion providing high mechanical strength, excellent abrasion and high durability.

Physical properties

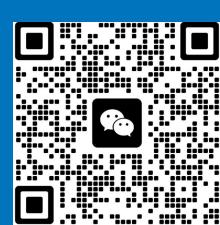
Properties ⁽¹⁾	Method	Features	Value
<i>Melting point</i>	<i>ISO 11357</i>	°C	161
<i>Crystallization temperature</i>	<i>ISO 11357</i>	°C	71
<i>MFI (215 °C/2.15 kg)</i>	<i>ISO 1133</i>	g/10min	8
<i>Density</i>	<i>DIN 53479</i>	g/cm ³	1.19

Mechanical properties

Properties ⁽²⁾	Method	Unit	Value
<i>Tensile strength at yield</i>	<i>ISO 527-3</i>	MPa	-
<i>Tensile strength at break</i>	<i>ISO 527-3</i>	MPa	86
<i>Tensile elongation at break</i>	<i>ISO 527-3</i>	%	354
<i>Tensile modulus</i>	<i>ISO 527-3</i>	MPa	57
<i>Tear resistance</i>	<i>ASTM D 1922</i>	N	11
<i>Puncture energy</i>	<i>UNE-EN 14477</i>	mJ	46
<i>Puncture deformation</i>	<i>UNE-EN 14477</i>	mm	10
<i>Spencer impact resistance</i>	<i>ASTM D 3420</i>	mJ	1968
<i>Flex crack (23 °C, 900 cycles)</i>	<i>Mil B-131C</i>	Holes/0.04m ²	0

Optical properties

Properties ⁽²⁾	Method	Unit	Value
<i>Haze</i>	<i>ASTM D 1003</i>	ASTM D 1003	3
<i>Gloss</i>	<i>ASTM D 523</i>	ASTM D 523	135



Gas barrier

Properties ⁽²⁾	Method	Unit	Value
Oxygen ($T=23^{\circ}\text{C}$, $\text{RH}=0\%$)	ASTM D 1003	$\text{ml}/\text{m}^2.\text{day}$	285
Water Vapour ($T=40^{\circ}\text{C}$, $\text{RH}=90\%$)	ASTM D 523	$\text{g}/\text{m}^2.\text{day}$	217

(1) Measured on base resin

(2) All tests carried out with a 5 layers airblown line, Die diameter = 90 mm · Die gap=1,4 mm
 Structure: PE (outer) / PE / TPU (medium) / PE / PE (inner), TPU layer delaminated for the tests
 Layer thickness distribution: PE = 50 μm , TPU = 50 μm , PE = 50 μm (Total film thickness = 150 μm).
 Sample conditioning and testing conditions: $T = 23^{\circ}\text{C}$, $\text{RH} = 50\%$

Recommended processing conditions

Properties	Unit	Hopper	Zone 1	Zone 2	Zone 3	Zone 4	Adaptor	Die
Temperature	°C	40-120	200-220	200-220	205-225	205-225	210-230	210-230

Drying conditions

ETERNALAST® TPU is supplied dry and packed in high barrier films. However, as TPU is a hygroscopic material, the user should take a special care of the possible moisture absorption once the bag or liner box has been opened. In case of moisture absorption, the material should be dried with dehumidified air at 80°C for more than 4 hours.

Standard packaging

25 kg bags

Available commercial samples

