

Eastapak™ 9921

Polyethylene Terephthalate
Eastman Chemical Company

Message:

Eastapak™ Polymer 9921 is an 0.80 lV (dL/g) copolymer PET that has proven itself as an exceptional, cost-effective option that continues to surpass expectations for quality, efficiency and convenience in a wide array applications.

General Information			
UL YellowCard	E118289-101981955		
Features	Copolymer		
Uses	Containers		
	Food Containers		
	Food Packaging		
	Medical Packaging		
	Packaging		
	Pharmaceutical Packaging		
Forms	Pellets		
Processing Method	Injection Molding		
Physical	Nominal Value	Unit	Test Method
Specific Gravity			
--	1.33	g/cm ³	ASTM D792
285°C	1.10	g/cm ³	ISO 1183/A
--	1.40	g/cm ³	ASTM D1505
Apparent Density			ASTM D1895
-- ¹	0.91	g/cm ³	
-- ²	0.85	g/cm ³	
Intrinsic Viscosity (23°C) ³			
	0.79		
Carbon Dioxide Permeability (23°C, 260.0 μm)			
	26	cm ³ · mm/m ² /atm/24 hr	ASTM D1434
PPT Tear Resistance			ASTM D2582
MD : 23°C, 260.0 μm	95	N	
TD : 23°C, 260.0 μm	117	N	
Tear Propagation Resistance ⁴			ASTM D1938
MD : 23°C, 260.0 μm	61	kN/m	
TD : 23°C, 260.0 μm	83	kN/m	
Heat of Fusion (23°C) ⁵			
	60.0	kJ/kg	ASTM E793
Pellet Shape			
	Cubical		
Pellet Size			
	3.27	mm	
Hardness	Nominal Value	Unit	Test Method

Rockwell Hardness (R-Scale, 23°C, Injection Molded)	111		ASTM D785
Mechanical	Nominal Value	Unit	Test Method
Tensile Modulus			
23°C, Injection Molded	2390	MPa	ASTM D638
23°C, Injection Molded	2400	MPa	ISO 527-2
Tensile Strength			
Yield, 23°C, Injection Molded	56.3	MPa	ASTM D638
Yield, 23°C, Injection Molded	56.2	MPa	ISO 527-2
Break, 23°C, Injection Molded	24.7	MPa	ASTM D638
Break, 23°C, Injection Molded	25.1	MPa	ISO 527-2
Flexural Modulus			
23°C, Injection Molded	2300	MPa	ASTM D790
23°C, Injection Molded	2330	MPa	ISO 178
Flexural Stress			
23°C, Injection Molded	82.3	MPa	ISO 178
Yield, 23°C, Injection Molded	74.7	MPa	ASTM D790
Films	Nominal Value	Unit	Test Method
Film Thickness - Tested	260	µm	
Secant Modulus			ASTM D882
MD : 260 µm	2140	MPa	
TD : 260 µm	2150	MPa	
Tensile Strength			ASTM D882
MD : Yield, 260 µm	53.7	MPa	
TD : Yield, 260 µm	47.9	MPa	
MD : Break, 260 µm	51.5	MPa	
TD : Break, 260 µm	46.7	MPa	
Tensile Elongation			ASTM D882
MD : Yield, 260 µm	5.8	%	
TD : Yield, 260 µm	4.7	%	
MD : Break, 260 µm	440	%	
TD : Break, 260 µm	560	%	
Dart Drop Impact ⁶			ASTM D1709A
-18°C, 260 µm	370	g	
23°C, 260 µm	450	g	
Elmendorf Tear Strength			ASTM D1922
MD : 260 µm	3500	g	
TD : 260 µm	5100	g	
Trouser Tear Resistance ⁷			ISO 6383-1
MD : 260 µm	73.3	N/mm	
TD : 260 µm	94.1	N/mm	
Oxygen Permeability (30°C, 250 µm, 50% RH)	5.2	cm ³ ·mm/m ² /atm/24 hr	ASTM D3985

Water Vapor Transmission	6.8	g/m ² /24 hr	ASTM E96
Impact	Nominal Value	Unit	Test Method
Notched Izod Impact			
-40°C, Injection Molded	40	J/m	ASTM D256
23°C, Injection Molded	66	J/m	ASTM D256
-40°C, Injection Molded	3.7	kJ/m ²	ISO 180/1A
23°C, Injection Molded	6.2	kJ/m ²	ISO 180/1A
Unnotched Izod Impact			
-40°C, 3.20 mm, Injection Molded	2900	J/m	ASTM D4812
-30°C, 3.20 mm, Injection Molded	No Break		ASTM D4812
-20°C, 3.20 mm, Injection Molded	No Break		ASTM D4812
23°C, 3.20 mm, Injection Molded	No Break		ASTM D4812
-40°C, Injection Molded ⁸	250	kJ/m ²	ISO 180/1U
-30°C, Injection Molded ⁹	270	kJ/m ²	ISO 180/1U
-20°C, Injection Molded ¹⁰	No Break		ISO 180/1U
23°C, Injection Molded ¹¹	No Break		ISO 180/1U
Instrumented Dart Impact			
-40°C, 2.50 mm, Injection Molded, Energy to Max Load	4.23	J	ASTM D3763
-40°C, 3.20 mm, Injection Molded, Energy to Max Load	3.72	J	ASTM D3763
23°C, 2.50 mm, Injection Molded, Energy to Max Load	33.4	J	ASTM D3763
23°C, 3.20 mm, Injection Molded, Energy to Max Load	34.3	J	ASTM D3763
-40°C, 2.50 mm, Injection Molded, Energy to Peak Force	3.44	J	ISO 6603-2
-40°C, 3.20 mm, Injection Molded, Energy to Peak Force	2.36	J	ISO 6603-2
23°C, 2.50 mm, Injection Molded, Energy to Peak Force	38.9	J	ISO 6603-2
23°C, 3.20 mm, Injection Molded, Energy to Peak Force	38.0	J	ISO 6603-2
Thermal	Nominal Value	Unit	Test Method
Deflection Temperature Under Load			
0.45 MPa, Unannealed, Injection Molded	67.7	°C	ASTM D648
0.45 MPa, Unannealed	66.2	°C	ISO 75-2/B
1.8 MPa, Unannealed, Injection Molded	61.4	°C	ASTM D648
1.8 MPa, Unannealed	61.1	°C	ISO 75-2/A
Peak Crystallization Temperature (DSC) ¹²	238	°C	ASTM D3418
Specific Heat ¹³			ASTM C351
23°C	1100	J/kg/°C	
80°C	1400	J/kg/°C	
100°C	1500	J/kg/°C	
200°C	1800	J/kg/°C	

280°C	2000	J/kg/°C	
Optical	Nominal Value	Unit	Test Method
Gloss (60°, 264 μm)	149		ASTM D2457
Transmittance			ASTM D1003
Total, 264 μm	92.0	%	
Regular, 264 μm	89.0	%	
Clarity (264 μm)	100		ASTM D1746
Haze (264 μm)	0.71	%	ASTM D1003
NOTE			
1.	Vibrated		
2.	Poured		
3.	EMN-A-AC-G-V-1		
4.	@ 254 mm/min		
5.	Determined by DSC on the first heating cycle.		
6.	12.7 mm dia. head, 127 mm dia. clamp, 600 mm drop		
7.	200 mm/min		
8.	4 mm		
9.	4 mm		
10.	4 mm		
11.	4 mm		
12.	Determined by DSC on the second heating cycle. Melting point rounded to the nearest 5°C because of variability of results.		
13.	Determined by DSC on the first heating cycle.		

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