Ecdel™ 9965

Thermoplastic Elastomer

Eastman Chemical Company

Message:

Ecdel™ elastomers are medical grade copolyester ethers (COPE). They offer the clarity, toughness, and chemical resistance needed in a variety of flexible packaging including medical applications. Ecdel™ Elastomer 9965 may be injection molded or extruded. Ecdel™ elastomers may be extrusion blow molded directly into bags or extruded into film for later fabrication into bags.
This product has been CRADLE TO CRADLE CERTIFIED Silver.
The CRADLE TO CRADLE CERTIFIED Mark is a registered certification mark used under license through McDonough Braungart Design Chemistry (MBDC). MBDC is a global sustainability consulting and product certification firm. The CRADLE TO CRADLE® framework moves beyond the traditional goal of reducing the negative impacts of commerce ('eco-efficiency'), to a new paradigm of increasing its positive impacts ('eco-effectiveness'). At its core, Cradle to Cradle design perceives the safe and productive processes of nature's 'biological metabolism' as a model for developing a 'technical metabolism' flow of industrial materials. Product components can be designed for continuous recovery and reutilization as biological and technical nutrients within these metabolisms. For more information about MBDC and to obtain printable certificates for Eastman Copolyesters, visit www.mbdc.com. Choose Eastman Chemical Company under Company Name in C2C Certified products to display a list of our products.

General Information	
Features	Good Chemical Resistance
	Good Flexibility
	Good Sterilizability
	Good Toughness
	High Heat Resistance
	Low Extractables
	Medium Clarity
Uses	Bags
	Film
	Medical Packaging
	Medical/Healthcare Applications
	Packaging
	Pharmaceutical Packaging
	Tubing
Forms	Pellets
Processing Method	Extrusion
	Extrusion Blow Molding
	Film Extrusion
	Injection Molding

Physical	Nominal Value	Unit	Test Method
Specific Gravity	1.13	g/cm³	ASTM D792
Melt Mass-Flow Rate (MFR) (230°C/2.16 kg)	20	g/10 min	ASTM D1238
Water Absorption (23°C, 24 hr)	0.35	%	ASTM D570

Inherent Viscosity [1] (23°C)	1.1		Internal Method
Heat of Fusion (23°C)	27.0	kJ/kg	ASTM E793
Tear Strength (23°C)	370	N	ASTM D1004
Hardness	**Nominal Value**	**Unit**	**Test Method**
Durometer Hardness			ASTM D2240
Shore A, 23°C	95		
Shore D, 23°C	55		
Mechanical	**Nominal Value**	**Unit**	**Test Method**
Tensile Modulus (23°C)	170	MPa	ASTM D638
Tensile Strength			ASTM D638
Yield, 23°C, 3.00 mm, Injection Molded [2]	14.0	MPa	
Break, 23°C, 2.00 mm [3]	20.0	MPa	
Tensile Elongation			ASTM D638
Yield, 23°C	30	%	
Break, 23°C	300	%	
Flexural Modulus (23°C)	150	MPa	ASTM D790
Coefficient of Friction	> 1.0		ASTM D1894
Films	**Nominal Value**	**Unit**	**Test Method**
Film Thickness - Tested	130	µm	
Secant Modulus			ASTM D882
Tangent, MD : 130 µm	185	MPa	
Tangent, TD : 130 µm	179	MPa	
Tensile Strength			ASTM D882
MD : Yield,130 µm	13.7	MPa	
TD : Yield,130 µm	13.5	MPa	
MD : Break, 130 µm	23.7	MPa	
TD : Break, 130 µm	22.6	MPa	
Tensile Elongation			ASTM D882
MD : Yield, 130 µm	26	%	
TD : Yield, 130 µm	26	%	
MD : Break, 130 µm	550	%	
TD : Break, 130 µm	550	%	
Oxygen Permeability (30°C, 130 µm)	841	$cm^3/m^2/24$ hr	ASTM D1434
Water Vapor Transmission Rate (38°C, 100% RH, 130 µm)	130	$g/m^2/24$ hr	ASTM F372
Elastomers	**Nominal Value**	**Unit**	**Test Method**
Clash-Berg Modulus			ASTM D1043
-70°C	930	MPa	
-28°C	240	MPa	
Impact	**Nominal Value**	**Unit**	**Test Method**
Notched Izod Impact (-40°C)	50	J/m	ASTM D256
Thermal	**Nominal Value**	**Unit**	**Test Method**

Brittleness Temperature	< -75.0	°C	ASTM D746
Glass Transition Temperature	-3.00	°C	DSC
Vicat Softening Temperature	170	°C	ASTM D1525 [4]
Peak Melting Temperature	207	°C	ASTM D3418
Peak Crystallization Temperature (DSC)	140	°C	DSC
CLTE - Flow (23°C)	9.0E-5	cm/cm/°C	ASTM D696
Specific Heat			DSC
25°C [5]	1600	J/kg/°C	
100°C [6]	1800	J/kg/°C	
150°C [7]	2000	J/kg/°C	
175°C [8]	2300	J/kg/°C	
200°C [9]	3100	J/kg/°C	
225°C [10]	2300	J/kg/°C	
Thermal Conductivity (23°C)	0.19	W/m/K	ASTM C177

Optical	Nominal Value	Unit	Test Method
Gloss (45°, 130 µm)	80		ASTM D2457
Transmittance			ASTM D1003
Total, 130 µm	93.0	%	
Regular, 130 µm	90.0	%	
Haze (130 µm)	1.0	%	ASTM D1003

NOTE	
1.	EMN-A-AC-G-V-1
2.	Type I, 500 mm/min
3.	Type IV, 500 mm/min
4.	Loading 1 (10 N)
5.	Solid
6.	Solid
7.	Solid
8.	Solid
9.	Transition, apparent specific heat, including the effects of the heat of fusion.
10.	Melt

Recommended distributors for this material

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