

# Vectra® E473i

# Celanese Corporation - Liquid Crystal Polymer

Sunday, November 3, 2019

### **General Information**

#### **Product Description**

Vectra E473i is a low warp LCP with easy flow and high temperature capability. Chemical abbreviation according to ISO 1043-1: LCP Inherently flame retardant FDA compliant UL-Listing V-0 in natural and black at 0.75mm thickness per UL 94 flame testing. Relative- Temperature-Index (RTI) according to UL 746B: electricals 130°C, mechanicals 130°C. UL = Underwriters Laboratories (USA)

General			
Material Status	Commercial: Active		
Availability	<ul><li>Africa &amp; Middle East</li><li>Asia Pacific</li></ul>	<ul><li>Europe</li><li>Latin America</li></ul>	North America
Features	<ul><li>Flame Retardant</li><li>Good Flow</li></ul>	<ul><li>High Heat Resistance</li><li>Low Warpage</li></ul>	
Agency Ratings	<ul> <li>FDA Unspecified Rating</li> </ul>		
RoHS Compliance	<ul> <li>Contact Manufacturer</li> </ul>		
Resin ID (ISO 1043)	• LCP		

Density         1.63 g/cm³         ISO 1183           Molding Shrinkage         ISO 294-4           Across Flow         0.50 %           Flow         0.10 %           Mechanical         Nominal Value         Unit         Test Method           Tensile Modulus         1.58E+6 psi         ISO 527-2/1A           Tensile Stress (Break)         16700 psi         ISO 527-2/1A/5           Tensile Strain (Break)         2.2 %         ISO 527-2/1A/5           Flexural Modulus (73°F)         1.58E+6 psi         ISO 178           Flexural Stress (73°F)         21800 psi         ISO 178           Compressive Stress (1% Strain)         8560 psi         ISO 604           Impact         Nominal Value         Unit         Test Method           Charpy Notched Impact Strength (73°F)         9.5 ft·lb/in²         ISO 179/1eA           Charpy Unnotched Impact Strength (73°F)         9.5 ft·lb/in²         ISO 179/1eU           Notched Izod Impact Strength (73°F)         4.8 ft·lb/in²         ISO 180/1A           Unnotched Izod Impact Strength (73°F)         4.8 ft·lb/in²         ISO 180/1U           Hardness         Nominal Value         Unit         Test Method           Rockwell Hardness (M-Scale)         150 2039-2	ASTM & ISO Properties 1				
Molding Shrinkage	Physical	Nominal Value	Unit	Test Method	
Across Flow         0.50         %           Flow         0.10         %           Mechanical         Nominal Value         Unit         Test Method           Tensile Modulus         1.58E+6         psi         1SO 527-2/1A           Tensile Stress (Break)         16700         psi         1SO 527-2/1A/5           Tensile Strain (Break)         2.2         %         1SO 527-2/1A/5           Flexural Modulus (73°F)         1.58E+6         psi         1SO 178           Flexural Stress (73°F)         21800         psi         1SO 178           Compressive Stress (1% Strain)         8560         psi         1SO 604           Impact         Nominal Value         Unit         Test Method           Charpy Notched Impact Strength (73°F)         9.5         ft-lb/in²         1SO 179/1eA           Charpy Unnotched Impact Strength (73°F)         4.8         ft-lb/in²         1SO 180/1A           Unnotched Izod Impact Strength (73°F)         4.8         ft-lb/in²         1SO 180/1A           Unnotched Izod Impact Strength (73°F)         16         ft-lb/in²         1SO 180/1A           Hardness         Nominal Value         Unit         Test Method           Rockwell Hardness (M-Scale)         Nominal Value         Unit<	Density	1.63	g/cm³	ISO 1183	
Flow         0.10         %           Mechanical         Nominal Value         Unit         Test Method           Tensile Modulus         1.58E+6         psi         ISO 527-2/1A/5           Tensile Stress (Break)         16700         psi         ISO 527-2/1A/5           Tensile Strain (Break)         2.2         %         ISO 527-2/1A/5           Flexural Modulus (73°F)         1.58E+6         psi         ISO 178           Flexural Stress (73°F)         21800         psi         ISO 178           Compressive Stress (1% Strain)         8560         psi         ISO 604           Impact         Nominal Value         Unit         Test Method           Charpy Notched Impact Strength (73°F)         9.5         ft-lb/in²         ISO 179/1eA           Charpy Unnotched Impact Strength (73°F)         4.8         ft-lb/in²         ISO 180/1A           Notched Izod Impact Strength (73°F)         14         ft-lb/in²         ISO 180/1A           Hardness         Nominal Value         Unit         Test Method           Rockwell Hardness (M-Scale)         40         ISO 2039-2           Thermal         Nominal Value         Unit         Test Method           Heat Deflection Temperature (264 psi, Unannealed)         482	Molding Shrinkage			ISO 294-4	
Mechanical         Nominal Value         Unit         Test Method           Tensile Modulus         1.58E+6         psi         ISO 527-2/1A           Tensile Stress (Break)         16700         psi         ISO 527-2/1A/5           Tensile Strain (Break)         2.2         %         ISO 527-2/1A/5           Flexural Modulus (73°F)         1.58E+6         psi         ISO 178           Flexural Stress (73°F)         21800         psi         ISO 178           Compressive Stress (1% Strain)         8560         psi         ISO 604           Impact         Nominal Value         Unit         Test Method           Charpy Notched Impact Strength (73°F)         9.5         ft·lb/in²         ISO 179/1eA           Charpy Unnotched Impact Strength (73°F)         16         ft·lb/in²         ISO 180/1A           Notched Izod Impact Strength (73°F)         14         ft·lb/in²         ISO 180/1A           Hardness         Nominal Value         Unit         Test Method           Rockwell Hardness (M-Scale)         40         ISO 2039-2           Thermal         Nominal Value         Unit         Test Method           Heat Deflection Temperature (264 psi, Unannealed)         482         °F         ISO 2039-2           Vicat Soften	Across Flow	0.50	%		
Tensile Modulus         1.58E+6         psi         ISO 527-2/1A           Tensile Stress (Break)         16700         psi         ISO 527-2/1A/5           Tensile Strain (Break)         2.2         %         ISO 527-2/1A/5           Tensile Strain (Break)         2.2         %         ISO 527-2/1A/5           Flexural Modulus (73°F)         1.58E+6         psi         ISO 178           Flexural Stress (73°F)         21800         psi         ISO 178           Compressive Stress (1% Strain)         8560         psi         ISO 604           Impact         Nominal Value         Unit         Test Method           Charpy Notched Impact Strength (73°F)         9.5         ft·lb/in²         ISO 179/1eA           Charpy Unnotched Impact Strength (73°F)         4.8         ft·lb/in²         ISO 179/1eU           Notched Izod Impact Strength (73°F)         4.8         ft·lb/in²         ISO 180/1A           Unnotched Izod Impact Strength (73°F)         4.8         ft·lb/in²         ISO 180/1A           Unnotched Izod Impact Strength (73°F)         4.8         ft·lb/in²         ISO 180/1U           Hardness         Nominal Value         Unit         Test Method           Rockwell Hardness (M-Scale)         Nominal Value         Unit         Te	Flow	0.10	%		
Tensile Stress (Break)         16700 psi         ISO 527-2/1A/5           Tensile Strain (Break)         2.2 %         ISO 527-2/1A/5           Flexural Modulus (73°F)         1.58E+6 psi         ISO 178           Flexural Stress (73°F)         21800 psi         ISO 178           Compressive Stress (1% Strain)         8560 psi         ISO 604           Impact         Nominal Value         Unit         Test Method           Charpy Notched Impact Strength (73°F)         9.5 ft·lb/in²         ISO 179/1eA           Charpy Unnotched Impact Strength (73°F)         9.5 ft·lb/in²         ISO 179/1eU           Notched Izod Impact Strength (73°F)         4.8 ft·lb/in²         ISO 180/1A           Unnotched Izod Impact Strength (73°F)         4.8 ft·lb/in²         ISO 180/1A           Unnotched Izod Impact Strength (73°F)         4.8 ft·lb/in²         ISO 180/1A           Hardness         Nominal Value         Unit         Test Method           Rockwell Hardness (M-Scale)         40         ISO 2039-2         ISO 2039-2           Thermal         Nominal Value         Unit         Test Method           Heat Deflection Temperature (264 psi, Unannealed)         482 °F         ISO 75-2/A           Vicat Softening Temperature         374 °F         ISO 306/B50           Melting	Mechanical	Nominal Value	Unit	Test Method	
Tensile Strain (Break)         2.2 %         ISO 527-2/1A/5           Flexural Modulus (73°F)         1.58E+6 psi         ISO 178           Flexural Stress (73°F)         21800 psi         ISO 178           Compressive Stress (1% Strain)         8560 psi         ISO 604           Impact         Nominal Value         Unit         Test Method           Charpy Notched Impact Strength (73°F)         9.5 ft·lb/in²         ISO 179/1eA           Charpy Unnotched Impact Strength (73°F)         4.8 ft·lb/in²         ISO 180/1A           Notched Izod Impact Strength (73°F)         4.8 ft·lb/in²         ISO 180/1A           Unnotched Izod Impact Strength (73°F)         4.8 ft·lb/in²         ISO 180/1A           Hardness         Nominal Value         Unit         Test Method           Rockwell Hardness (M-Scale)         40         ISO 2039-2           Thermal         Nominal Value         Unit         Test Method           Heat Deflection Temperature (264 psi, Unannealed)         482 °F         ISO 75-2/A           Heat Deflection Temperature (1160 psi, Unannealed)         318 °F         ISO 306/B50           Melting Temperature 2         635 °F         ISO 11357-3           CLTE - Flow         3.3E-6 in/in/°F         ISO 11359-2	Tensile Modulus	1.58E+6	psi	ISO 527-2/1A	
Flexural Modulus (73°F)	Tensile Stress (Break)	16700	psi	ISO 527-2/1A/5	
Plexural Stress (73°F)   21800 psi   ISO 178	Tensile Strain (Break)	2.2	%	ISO 527-2/1A/5	
Compressive Stress (1% Strain)         8560 psi         ISO 604           Impact         Nominal Value         Unit         Test Method           Charpy Notched Impact Strength (73°F)         9.5 ft·lb/in²         ISO 179/1eA           Charpy Unnotched Impact Strength (73°F)         16 ft·lb/in²         ISO 180/1A           Notched Izod Impact Strength (73°F)         4.8 ft·lb/in²         ISO 180/1A           Unnotched Izod Impact Strength (73°F)         14 ft·lb/in²         ISO 180/1U           Hardness         Nominal Value         Unit         Test Method           Rockwell Hardness (M-Scale)         40         ISO 2039-2           Thermal         Nominal Value         Unit         Test Method           Heat Deflection Temperature (264 psi, Unannealed)         482 °F         ISO 75-2/A           Heat Deflection Temperature (1160 psi, Unannealed)         318 °F         ISO 75-2/C           Vicat Softening Temperature         374 °F         ISO 306/B50           Melting Temperature²         635 °F         ISO 11357-3           CLTE - Flow         3.3E-6 in/in/°F         ISO 11359-2	Flexural Modulus (73°F)	1.58E+6	psi	ISO 178	
Impact         Nominal Value         Unit         Test Method           Charpy Notched Impact Strength (73°F)         9.5         ft·lb/in²         ISO 179/1eA           Charpy Unnotched Impact Strength (73°F)         16         ft·lb/in²         ISO 180/1A           Notched Izod Impact Strength (73°F)         4.8         ft·lb/in²         ISO 180/1A           Unnotched Izod Impact Strength (73°F)         14         ft·lb/in²         ISO 180/1U           Hardness         Nominal Value         Unit         Test Method           Rockwell Hardness (M-Scale)         40         ISO 2039-2           Thermal         Nominal Value         Unit         Test Method           Heat Deflection Temperature (264 psi, Unannealed)         482         °F         ISO 75-2/A           Heat Deflection Temperature (1160 psi, Unannealed)         318         °F         ISO 306/B50           Vicat Softening Temperature         374         °F         ISO 306/B50           Melting Temperature²         635         °F         ISO 11357-3           CLTE - Flow         3.3E-6         in/in/°F         ISO 11359-2	Flexural Stress (73°F)	21800	psi	ISO 178	
Charpy Notched Impact Strength (73°F)         9.5 ft·lb/in²         ISO 179/1eA           Charpy Unnotched Impact Strength (73°F)         16 ft·lb/in²         ISO 179/1eU           Notched Izod Impact Strength (73°F)         4.8 ft·lb/in²         ISO 180/1A           Unnotched Izod Impact Strength (73°F)         14 ft·lb/in²         ISO 180/1U           Hardness         Nominal Value         Unit         Test Method           Rockwell Hardness (M-Scale)         40         ISO 2039-2           Thermal         Nominal Value         Unit         Test Method           Heat Deflection Temperature (264 psi, Unannealed)         482 °F         ISO 75-2/A           Heat Deflection Temperature (1160 psi, Unannealed)         318 °F         ISO 75-2/C           Vicat Softening Temperature         374 °F         ISO 306/B50           Melting Temperature²         635 °F         ISO 11357-3           CLTE - Flow         3.3E-6 in/in/°F         ISO 11359-2	Compressive Stress (1% Strain)	8560	psi	ISO 604	
Charpy Unnotched Impact Strength (73°F)         16 ft·lb/in²         ISO 179/1eU           Notched Izod Impact Strength (73°F)         4.8 ft·lb/in²         ISO 180/1A           Unnotched Izod Impact Strength (73°F)         14 ft·lb/in²         ISO 180/1U           Hardness         Nominal Value         Unit         Test Method           Rockwell Hardness (M-Scale)         40         ISO 2039-2           Thermal         Nominal Value         Unit         Test Method           Heat Deflection Temperature (264 psi, Unannealed)         482 °F         ISO 75-2/A           Heat Deflection Temperature (1160 psi, Unannealed)         318 °F         ISO 306/B50           Vicat Softening Temperature         374 °F         ISO 306/B50           Melting Temperature²         635 °F         ISO 11357-3           CLTE - Flow         3.3E-6 in/in/°F         ISO 11359-2	Impact	Nominal Value	Unit	Test Method	
Notched Izod Impact Strength (73°F)         4.8 ft·lb/in²         ISO 180/1A           Unnotched Izod Impact Strength (73°F)         14 ft·lb/in²         ISO 180/1U           Hardness         Nominal Value         Unit         Test Method           Rockwell Hardness (M-Scale)         40 ISO 2039-2           Thermal         Nominal Value         Unit         Test Method           Heat Deflection Temperature (264 psi, Unannealed)         482 °F         ISO 75-2/A           Heat Deflection Temperature (1160 psi, Unannealed)         318 °F         ISO 75-2/C           Vicat Softening Temperature         374 °F         ISO 306/B50           Melting Temperature 2         635 °F         ISO 11357-3           CLTE - Flow         3.3E-6 in/in/°F         ISO 11359-2	Charpy Notched Impact Strength (73°F)	9.5	ft·lb/in²	ISO 179/1eA	
Unnotched Izod Impact Strength (73°F)         14 ft·lb/in²         ISO 180/1U           Hardness         Nominal Value         Unit         Test Method           Rockwell Hardness (M-Scale)         40 ISO 2039-2         ISO 2039-2           Thermal         Nominal Value         Unit         Test Method           Heat Deflection Temperature (264 psi, Unannealed)         482 °F         ISO 75-2/A           Heat Deflection Temperature (1160 psi, Unannealed)         318 °F         ISO 75-2/C           Vicat Softening Temperature         374 °F         ISO 306/B50           Melting Temperature 2         635 °F         ISO 11357-3           CLTE - Flow         3.3E-6 in/in/°F         ISO 11359-2	Charpy Unnotched Impact Strength (73°F)	16	ft·lb/in²	ISO 179/1eU	
Hardness         Nominal Value         Unit         Test Method           Rockwell Hardness (M-Scale)         40         ISO 2039-2           Thermal         Nominal Value         Unit         Test Method           Heat Deflection Temperature (264 psi, Unannealed)         482         °F         ISO 75-2/A           Heat Deflection Temperature (1160 psi, Unannealed)         318         °F         ISO 75-2/C           Vicat Softening Temperature         374         °F         ISO 306/B50           Melting Temperature 2         635         °F         ISO 11357-3           CLTE - Flow         3.3E-6         in/in/°F         ISO 11359-2	Notched Izod Impact Strength (73°F)	4.8	ft·lb/in²	ISO 180/1A	
Rockwell Hardness (M-Scale)         40         ISO 2039-2           Thermal         Nominal Value         Unit         Test Method           Heat Deflection Temperature (264 psi, Unannealed)         482         °F         ISO 75-2/A           Heat Deflection Temperature (1160 psi, Unannealed)         318         °F         ISO 75-2/C           Vicat Softening Temperature         374         °F         ISO 306/B50           Melting Temperature 2         635         °F         ISO 11357-3           CLTE - Flow         3.3E-6         in/in/°F         ISO 11359-2	Unnotched Izod Impact Strength (73°F)	14	ft·lb/in²	ISO 180/1U	
Thermal         Nominal Value         Unit         Test Method           Heat Deflection Temperature (264 psi, Unannealed)         482         °F         ISO 75-2/A           Heat Deflection Temperature (1160 psi, Unannealed)         318         °F         ISO 75-2/C           Vicat Softening Temperature         374         °F         ISO 306/B50           Melting Temperature 2         635         °F         ISO 11357-3           CLTE - Flow         3.3E-6         in/in/°F         ISO 11359-2	Hardness	Nominal Value	Unit	Test Method	
Heat Deflection Temperature (264 psi, Unannealed)  Heat Deflection Temperature (1160 psi, Unannealed)  Vicat Softening Temperature  374 °F ISO 306/B50  Melting Temperature  635 °F ISO 11357-3  CLTE - Flow  3.3E-6 in/in/°F ISO 11359-2	Rockwell Hardness (M-Scale)	40		ISO 2039-2	
Heat Deflection Temperature (1160 psi, Unannealed)318 °FISO 75-2/CVicat Softening Temperature374 °FISO 306/B50Melting Temperature 2635 °FISO 11357-3CLTE - Flow3.3E-6 in/in/°FISO 11359-2	Thermal	Nominal Value	Unit	Test Method	
Vicat Softening Temperature         374 °F         ISO 306/B50           Melting Temperature <sup>2</sup> 635 °F         ISO 11357-3           CLTE - Flow         3.3E-6 in/in/°F         ISO 11359-2	Heat Deflection Temperature (264 psi, Unannealed)	482	°F	ISO 75-2/A	
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CLTE - Flow 3.3E-6 in/in/°F ISO 11359-2	Vicat Softening Temperature	374	°F	ISO 306/B50	
	Melting Temperature <sup>2</sup>	635	°F	ISO 11357-3	
CLTE - Transverse 6.1E-6 in/in/°F ISO 11359-2	CLTE - Flow	3.3E-6	in/in/°F	ISO 11359-2	
	CLTE - Transverse	6.1E-6	in/in/°F	ISO 11359-2	



### Vectra® E473i

# Celanese Corporation - Liquid Crystal Polymer

Electrical	Nominal Value	Unit	Test Method
Surface Resistivity	> 1.0E+15	ohms	IEC 60093
Volume Resistivity	1.0E+16	ohms·cm	IEC 60093
Electric Strength	1200	V/mil	IEC 60243-1
Relative Permittivity (1 MHz)	4.00		IEC 60250
Dissipation Factor (1 MHz)	0.34		IEC 60250
Comparative Tracking Index	175	V	IEC 60112
Flammability	Nominal Value	Unit	Test Method
Flame Rating (0.06 in)	V-0		UL 94

Processing Information				
Injection	Nominal Value	Unit		
Drying Temperature	302	°F		
Drying Time	6.0	hr		
Suggested Max Moisture	0.010	%		
Hopper Temperature	140 to 176	°F		
Rear Temperature	599 to 617	°F		
Middle Temperature	608 to 626	°F		
Front Temperature	617 to 635	°F		
Nozzle Temperature	635 to 653	°F		
Processing (Melt) Temp	635 to 653	°F		
Mold Temperature	176 to 248	°F		
Injection Rate	Fast			
Injection Notes				

Feeding zone temperature: 60 to 80°C Zone4 temperature: 330 to 340°C

### Notes

<sup>1</sup> Typical properties: these are not to be construed as specifications.



<sup>&</sup>lt;sup>2</sup> 10°C/min