Ingeo™ 3100HP

Polylactic Acid

NatureWorks® LLC

Message:

Ingeo 3100HP is a medium viscosity product from NatureWorks LLC, designed for medium flow injection molding applications. It is designed to crystallize during processing, leading to higher heat deflection temperatures in opaque applications.

The variety of products made with 3100HP is widely varied and growing. Applications include disposables such as cutlery, cups, plates, cosmetic packaging, and durables such as electronics housings and semi-durable building materials.

General Information			
Features	Updatable resources		
	Medium liquidity		
	Compliance of Food Exposure		
	Medium viscosity		
Uses	Cosmetic Packaging		
	Cup		
	Electrical housing		
	Building materials		
	General		
Agency Ratings	EEC 94/62/EC Article 11		
	FDA Food Exposure, Not Rated		
	Europe 10/1/2011 12:00:00 AM		
Drogossing Mathed	Injection molding		
Processing Method	Injection molding		
Physical	Nominal Value	Unit	Test Method
-	· · ·	Unit g/cm ³	Test Method ASTM D792
Physical Specific Gravity Melt Mass-Flow Rate (MFR) (210°C/2.16	Nominal Value	g/cm ³	ASTM D792
Physical Specific Gravity Melt Mass-Flow Rate (MFR) (210°C/2.16 kg)	Nominal Value		
Physical Specific Gravity Melt Mass-Flow Rate (MFR) (210°C/2.16 kg) Molding Shrinkage - Flow	Nominal Value 1.24 24	g/cm³ g/10 min	ASTM D792
Physical Specific Gravity Melt Mass-Flow Rate (MFR) (210°C/2.16 kg) Molding Shrinkage - Flow 1	Nominal Value 1.24 24 1.7 - 1.8	g/cm³ g/10 min %	ASTM D792
Physical Specific Gravity Melt Mass-Flow Rate (MFR) (210°C/2.16 kg) Molding Shrinkage - Flow 1 2	Nominal Value 1.24 24	g/cm³ g/10 min	ASTM D792
Physical Specific Gravity Melt Mass-Flow Rate (MFR) (210°C/2.16 kg) Molding Shrinkage - Flow 1	Nominal Value 1.24 24 1.7 - 1.8 0.20 - 0.40 3.1	g/cm ³ g/10 min % %	ASTM D792
Physical Specific Gravity Melt Mass-Flow Rate (MFR) (210°C/2.16 kg) Molding Shrinkage - Flow 1 2 Relative Viscosity ³ Mechanical	Nominal Value 1.24 24 1.7 - 1.8 0.20 - 0.40	g/cm³ g/10 min %	ASTM D792 ASTM D1238
Physical Specific Gravity Melt Mass-Flow Rate (MFR) (210°C/2.16 kg) Molding Shrinkage - Flow 1 2 Relative Viscosity ³ Mechanical Tensile Strength	Nominal Value 1.24 24 1.7 - 1.8 0.20 - 0.40 3.1	g/cm ³ g/10 min % %	ASTM D792 ASTM D1238 ASTM D5225
Physical Specific Gravity Melt Mass-Flow Rate (MFR) (210°C/2.16 kg) Molding Shrinkage - Flow 1 2 Relative Viscosity ³ Mechanical Tensile Strength Yield ⁴	Nominal Value 1.24 24 1.7 - 1.8 0.20 - 0.40 3.1	g/cm ³ g/10 min % %	ASTM D792 ASTM D1238 ASTM D5225 Test Method
Physical Specific Gravity Melt Mass-Flow Rate (MFR) (210°C/2.16 kg) Molding Shrinkage - Flow 1 2 Relative Viscosity ³ Mechanical Tensile Strength	Nominal Value 1.24 24 1.7 - 1.8 0.20 - 0.40 3.1 Nominal Value	g/cm ³ g/10 min % % Unit	ASTM D792 ASTM D1238 ASTM D5225 Test Method ASTM D638
PhysicalSpecific GravityMelt Mass-Flow Rate (MFR) (210°C/2.16 kg)Molding Shrinkage - Flow 1 2Relative Viscosity 3MechanicalTensile Strength Yield 5Yield 5Tensile Elongation	Nominal Value 1.24 24 1.7 - 1.8 0.20 - 0.40 3.1 Nominal Value 64.1	g/cm ³ g/10 min % % Unit MPa	ASTM D792 ASTM D1238 ASTM D5225 Test Method ASTM D638 ASTM D638
Physical Specific Gravity Melt Mass-Flow Rate (MFR) (210°C/2.16 kg) Molding Shrinkage - Flow 1 2 Relative Viscosity ³ Mechanical Tensile Strength Yield ⁴ Yield ⁵	Nominal Value 1.24 24 1.7 - 1.8 0.20 - 0.40 3.1 Nominal Value 64.1	g/cm ³ g/10 min % % Unit MPa	ASTM D792 ASTM D1238 ASTM D1238 ASTM D5225 Test Method ASTM D638 ASTM D638

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	Flexural Modulus			ASTM D790
Inscription Inscription Inscription -1° 188 MPa ASTM D780 -1° 122 MPa ASTM D780 Impact 122 MPa ASTM D780 Impact 122 MPa ASTM D780 Nothed Impact 323 I/n ASTM D256 -1° 18 J/m ASTM D256 -1° 18 J/m ASTM D256 -1° 18 J/m ASTM D256 -1° Nominal Value Unit Test MathD25 Deflection Temperature Under Load 540 C ASTM 2026 -0.45 MPa, not anneidel ¹⁶ 540 C ASTM 2026 -0.45 MPa, not anneidel ¹⁶ 540 C C ASTM 2026 -0.45 MPa, not anneidel ¹⁶ 180 C C C -1° Carice ASTM 2026 S C C -1° MathD3 MathD3 C C C C C C C	8	4360	MPa	ASTM D790
-1°108MPaASTM D730-1°112MPaASTM D730ImpactNorminal ValueUnitTest MethodNotched izod Inpact-3J/mASTM D256-1°18J/mASTM D256-1°18J/mASTM D256-1°18J/mASTM D256Definition Temperature Under LoadValueTest MethodDefinition Temperature Under Load16°CASTM 20320.45 MPa, not annealed ¹⁹ 49°CASTM 20320.45 MPa, not annealed ¹⁹ 180°CSTM 20320.45 MPa, not annealed ¹⁹ 180°CSTM 20320.45 MPa, not annealed ¹⁹ 60°CSTM 20320.45 MPa, not annealed ¹⁹ 60°CSTM 20320.45 MPa, not annealed ¹⁹ 180°CSTM 20320.45 MPa, not annealed ¹⁹ 180°CSTM 20320.45 MPa, not annealed ¹⁹ 60°CSTM 20320.45 MPa, not annealed ¹⁹ 180°CSTM 20320.45 MPa, not annealed ¹⁹ 180°CSTM 20321°0paque°CSTM 2032STM 20321°10°CSTM 2032STM 2032101010°CSTM 2032101010°CSTM 2032101010°CSTM 2032101010°CSTM 2032101010°CSTM 20321010	9	3590	MPa	ASTM D790
100 Mode Mode Mode ASTM 0799 Impact Nominal Value Unit Test Method Nothed Izod Impact 32 //m ASTM 0796 ¹² 32 //m ASTM 0256 ¹³ 18 //m ASTM 0256 ¹³ 18 //m ASTM 0256 Thermal Nominal Value Test Method Test Method Defection Temperature Under Load 54.0 "C ASTM 2002 0.45 MPa, not annealed ¹⁴ 149 "C ASTM 2002 0.45 MPa, not annealed ¹⁵ 54.0 "C ASTM 2002 0.45 MPa, not annealed ¹⁵ 109 "C STM 2002 0.45 MPa, not annealed ¹⁵ 64.0 "C STM 2002	Flexural Strength			ASTM D790
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-12J22J/mASTM D256-1318J/mASTM D256ThernalNominal ValueUnitTest MethodDeflection Temperature Under Load149°CASTM E20920.45 MPa, not annealed ¹⁶ 199°CASTM E20920.45 MPa, not annealed ¹⁵ 54.0°CASTM E2092Deflection Temperature (DSC) ¹⁰ 18.0°C*********************************	Impact	Nominal Value	Unit	Test Method
Image: Constraint of the second sec	Notched Izod Impact			ASTM D256
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Deflection Temperature Under LoadASTM E20920.45 MPa, not annealed 14149°CASTM E20920.45 MPa, not annealed 1554.0°CASTM E2092Peak Crystallization Temperature (DSC) 16180°C*********************************	13	18	J/m	ASTM D256
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Peak Crystallization Temperature (DSC) ¹⁶ 180 "C Optical Nominal Value Clarity - ¹⁷ Opaque	0.45 MPa, not annealed ¹⁴	149	°C	ASTM E2092
OpticalNominal ValueClarity- 17Opaque- 18TransparentInjectionNominal ValueSuggested Max Moisture< 0.025	0.45 MPa, not annealed ¹⁵	54.0	°C	ASTM E2092
Clarity - 17 Opaque - 18 Transparent Injection Nominal Value Unit Suggested Max Moisture < 0.025	Peak Crystallization Temperature (DSC) ¹⁶	180	°C	
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Hopper Temperature 21.1 "C Rear Temperature 185 "C Middle Temperature 195 "C Front Temperature 200 "C Nozzle Temperature 200 "C Nozzle Temperature 200 "C Nozzle Temperature 200 "C Notzle Temperature 200 "C Mold Temperature 120 "C Mold Temperature 120 "C Back Pressure 1.72 MPa Screw Speed 200 rpm Note: Amorphous polymer must be dried betreperature rpm Note: Amorphous polymer must be dried betreperature where formula included 1wt% nucleating agent remerature where formula included 1wt% nucleating agent 1. (LAK-301 from Takemoto Oil & Fat) Screw Speed 2. Molded amorphous with 26°C mold temperature 3. Measured at 1.0 g/dL in chloroform at 30°C Molded crystalline with 120°C mold temperature Molded crystalline with 120°C Screw Speed	Injection	Nominal Value	Unit	
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mold temperature where formula included 1wt% nucleating agent		Measured at 1.0 g/dL in		
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	Molded amorphous with 26°C
5.	mold temperature
	Molded crystalline with 120°C
	mold temperature where formula
	included 1wt% nucleating agent
6.	(LAK-301 from Takemoto Oil & Fat)
	Molded amorphous with 26°C
7.	mold temperature
	Molded crystalline with 120°C
	mold temperature where formula
	included 1wt% nucleating agent
8.	(LAK-301 from Takemoto Oil & Fat)
	Molded amorphous with 26°C
9.	mold temperature
	Molded crystalline with 120°C
	mold temperature where formula
	included 1wt% nucleating agent
10.	(LAK-301 from Takemoto Oil & Fat)
	Molded amorphous with 26°C
11.	mold temperature
	Molded crystalline with 120°C
	mold temperature where formula
	included 1wt% nucleating agent
12.	(LAK-301 from Takemoto Oil & Fat)
	Molded amorphous with 26°C
13.	mold temperature
	Molded crystalline with 120°C
	mold temperature where formula
	included 1wt% nucleating agent
14.	(LAK-301 from Takemoto Oil & Fat)
	Molded amorphous with 26°C
15.	mold temperature
	Molded crystalline with 120°C
	mold temperature where formula
	included 1wt% nucleating agent
16.	(LAK-301 from Takemoto Oil & Fat)
	Molded crystalline with 120°C
	mold temperature where formula
	included 1wt% nucleating agent
17.	(LAK-301 from Takemoto Oil & Fat)
	Molded amorphous with 26°C
18.	mold temperature

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