



# ATTANE™ 4201G

## Ultra Low Density Polyethylene Resin

### Overview

- For food packaging applications
- Offers toughness, seal properties, optical properties and processability

Complies with:

- U.S. FDA FCN 424
- Canadian HPFB No Objection (with Limitations)
- Europe EU-Directive 2002/72/EC
- Japan Hygienic Olefin and Styrene Plastics Association
- U.S. FDA-DMF
  - Consult the regulations for complete details.

Physical	Nominal Value (English)	Nominal Value (SI)	Test Method
Density	0.912 g/cm <sup>3</sup>	0.912 g/cm <sup>3</sup>	ASTM D792
Melt Index (190°C/2.16 kg)	1.0 g/10 min	1.0 g/10 min	ASTM D1238
Films	Nominal Value (English)	Nominal Value (SI)	Test Method
Film Puncture Resistance			Dow Method
0.800 mil (20.3 µm)	295 ft-lb/in <sup>3</sup>	24.4 J/cm <sup>3</sup>	
2.00 mil (50.8 µm)	260 ft-lb/in <sup>3</sup>	21.5 J/cm <sup>3</sup>	
Secant Modulus			ASTM D882
2% Secant, MD: 0.800 mil (20.3 µm)	18600 psi	128 MPa	
2% Secant, MD: 2.00 mil (50.8 µm)	18800 psi	130 MPa	
2% Secant, TD: 0.800 mil (20.3 µm)	20900 psi	144 MPa	
2% Secant, TD: 2.00 mil (50.8 µm)	22300 psi	153 MPa	
Tensile Strength			ASTM D882
MD: Yield, 0.800 mil (20.3 µm)	1430 psi	9.83 MPa	
MD: Yield, 2.00 mil (50.8 µm)	1330 psi	9.14 MPa	
TD: Yield, 0.800 mil (20.3 µm)	1300 psi	8.96 MPa	
TD: Yield, 2.00 mil (50.8 µm)	1320 psi	9.08 MPa	
MD: Break, 0.800 mil (20.3 µm)	7110 psi	49.0 MPa	
MD: Break, 2.00 mil (50.8 µm)	7230 psi	49.8 MPa	
TD: Break, 0.800 mil (20.3 µm)	6570 psi	45.3 MPa	
TD: Break, 2.00 mil (50.8 µm)	6650 psi	45.8 MPa	
Tensile Elongation			ASTM D882
MD: Break, 0.800 mil (20.3 µm)	460 %	460 %	
MD: Break, 2.00 mil (50.8 µm)	660 %	660 %	
TD: Break, 0.800 mil (20.3 µm)	690 %	690 %	
TD: Break, 2.00 mil (50.8 µm)	760 %	760 %	
Dart Drop Impact			ASTM D1709B
0.800 mil (20.3 µm)	450 g	450 g	
2.00 mil (50.8 µm)	610 g	610 g	
Elmendorf Tear Strength			ASTM D1922
MD: 0.800 mil (20.3 µm)	330 g	330 g	
MD: 2.00 mil (50.8 µm)	1000 g	1000 g	
TD: 0.800 mil (20.3 µm)	530 g	530 g	
TD: 2.00 mil (50.8 µm)	1200 g	1200 g	
Seal Initiation Temperature			
0.800 mil (20.3 µm)	203 °F	95.0 °C	Dow Method <sup>1</sup>
2.00 mil (50.8 µm)	207 °F	97.2 °C	Dow Method <sup>2</sup>
Oxygen Permeability			ASTM D3985
73°F (23°C), 0.800 mil (20.3 µm)	720 cm <sup>3</sup> -mil/100in <sup>2</sup> /atm/24 hr	280 cm <sup>3</sup> -mm/m <sup>2</sup> /at m/24 hr	
73°F (23°C), 2.00 mil (50.8 µm)	710 cm <sup>3</sup> -mil/100in <sup>2</sup> /atm/24 hr	280 cm <sup>3</sup> -mm/m <sup>2</sup> /at m/24 hr	

<b>Films</b>	<b>Nominal Value (English)</b>	<b>Nominal Value (SI)</b>	<b>Test Method</b>
Water Vapor Transmission Rate 2.00 mil (50.8 µm)	1.4 g·mil/100in <sup>2</sup> /at m/24 hr	0.53 g·mm/m <sup>2</sup> /atm/ 24 hr	ASTM F1249
Carbon Dioxide Transmission Rate 73°F (23°C), 0.00200 in (0.0508 mm)	3100 cm <sup>3</sup> ·mil/100in <sup>2</sup> /atm/24 hr	1200 cm <sup>3</sup> ·mm/m <sup>2</sup> /at m/24 hr	Dow Method
<b>Thermal</b>	<b>Nominal Value (English)</b>	<b>Nominal Value (SI)</b>	<b>Test Method</b>
Vicat Softening Temperature	199 °F	92.8 °C	ASTM D1525
Melting Temperature (DSC)	253 °F	123 °C	Dow Method
<b>Optical</b>	<b>Nominal Value (English)</b>	<b>Nominal Value (SI)</b>	<b>Test Method</b>
Gloss			ASTM D2457
45°, 2.00 mil (50.8 µm)	71	71	
45°, 0.800 mil (20.3 µm)	67	67	
Clarity			ASTM D1746
0.800 mil (20.3 µm)	97.0	97.0	
2.00 mil (50.8 µm)	98.0	98.0	
Haze			ASTM D1003
2.00 mil (50.8 µm)	8.0 %	8.0 %	
0.800 mil (20.3 µm)	8.0 %	8.0 %	

### Extrusion Notes

Fabrication Conditions For Blown Film:

- Screw Size: 2.5 in. (63.5 mm); 30:1 L/D
- Screw Type: DBS II
- Die Gap: 70 mil (1.8 mm)
- Melt Temperature: 440-450°F (226-232°C)
- Output: 10 lb/hr/in. of die circumference
- Die Diameter: 6 in.
- Blow-Up Ratio: 2.5:1
- Screw Speed: 75 rpm
- Frost Line Height: 25 in.

### Notes

These are typical properties only and are not to be construed as specifications. Users should confirm results by their own tests.

<sup>1</sup> Temperature at which a 0.8 mil film achieves 1 lb/in. (4.4 N/25.4 mm) heat seal strengths.  
Heat Seal Strengths, DTC HT Tester 0.5 S dwell, 40 psi bar pressure, pull speed 10 in./min (254 mm/sec).

<sup>2</sup> Temperature at which a 2.0 mil film achieves 2 lb/in. (8.8 N/25.4 mm) heat seal strengths.  
Heat Seal Strengths, DTC HT Tester 0.5 S dwell, 40 psi bar pressure, pull speed 10 in./min (254 mm/sec).

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