



# ATTANE™ 4203

## Ultra Low Density Polyethylene Resin

### Overview

- For packaging applications
- Offers high pinhole resistance, excellent flexibility and abuse resistance
- Excellent sealing characteristics
- Complies with CANADIAN HPFB NO OBJECTION (WITH LIMITATIONS)
- When used unmodified for food contact applications, ATTANE™ 4203 Ultra Low Density Ethylene/Octene Copolymer will comply with the Federal Food, Drug, and Cosmetic Act as a food contact substance as a result of a premarket food contact notification (FCN) with an effective date of October 7, 2004 under FCN 424. This notification allows for use of this product as articles or components of articles used in contact with all food types under Conditions of Use A through H, as described in U.S. FDA Table 2 of 21 CFR § 176.170(c). The composition of this product complies with the requirements for use in contact with food of the EU-Directive 90/128/EEC. Contact a Dow Sales Office to obtain a detailed food contact compliance letter for this product.

Physical	Nominal Value (English)	Nominal Value (SI)	Test Method
Density	0.905 g/cm <sup>3</sup>	0.905 g/cm <sup>3</sup>	ASTM D792
Melt Index (190°C/2.16 kg)	0.80 g/10 min	0.80 g/10 min	ASTM D1238
Films	Nominal Value (English)	Nominal Value (SI)	Test Method
Film Puncture Resistance			Dow Method
2.00 mil (50.8 µm)	247 ft-lb/in <sup>3</sup>	20.4 J/cm <sup>3</sup>	
0.800 mil (20.3 µm)	260 ft-lb/in <sup>3</sup>	21.5 J/cm <sup>3</sup>	
Film Toughness			ASTM D882
MD: 2.00 mil (50.8 µm)	13500 ft-lb/in <sup>3</sup>	1110 J/cm <sup>3</sup>	
MD: 0.800 mil (20.3 µm)	12700 ft-lb/in <sup>3</sup>	1050 J/cm <sup>3</sup>	
TD: 2.00 mil (50.8 µm)	15500 ft-lb/in <sup>3</sup>	1280 J/cm <sup>3</sup>	
TD: 0.800 mil (20.3 µm)	13800 ft-lb/in <sup>3</sup>	1140 J/cm <sup>3</sup>	
Tensile Strength			ASTM D882
MD: Yield, 2.00 mil (50.8 µm)	1220 psi	8.40 MPa	
MD: Yield, 0.800 mil (20.3 µm)	1240 psi	8.56 MPa	
TD: Yield, 2.00 mil (50.8 µm)	1090 psi	7.50 MPa	
TD: Yield, 0.800 mil (20.3 µm)	1030 psi	7.07 MPa	
MD: Break, 2.00 mil (50.8 µm)	7570 psi	52.2 MPa	
MD: Break, 0.800 mil (20.3 µm)	7630 psi	52.6 MPa	
TD: Break, 2.00 mil (50.8 µm)	6620 psi	45.7 MPa	
TD: Break, 0.800 mil (20.3 µm)	5940 psi	41.0 MPa	
Tensile Elongation			ASTM D882
MD: Break, 2.00 mil (50.8 µm)	650 %	650 %	
MD: Break, 0.800 mil (20.3 µm)	450 %	450 %	
TD: Break, 2.00 mil (50.8 µm)	740 %	740 %	
TD: Break, 0.800 mil (20.3 µm)	650 %	650 %	
Dart Drop Impact			ASTM D1709B
2.00 mil (50.8 µm)	> 850 g	> 850 g	
0.800 mil (20.3 µm)	> 850 g	> 850 g	
Elmendorf Tear Strength			ASTM D1922
MD: 2.00 mil (50.8 µm)	830 g	830 g	
MD: 0.800 mil (20.3 µm)	260 g	260 g	
TD: 2.00 mil (50.8 µm)	1100 g	1100 g	
TD: 0.800 mil (20.3 µm)	450 g	450 g	
Seal Initiation Temperature			
2.00 mil (50.8 µm)	183 °F	83.9 °C	Dow Method <sup>1</sup>
0.800 mil (20.3 µm)	190 °F	87.8 °C	Dow Method <sup>2</sup>
Oxygen Permeability			ASTM D3985
73°F (23°C), 2.00 mil (50.8 µm)	930 cm <sup>3</sup> ·mil/100in <sup>2</sup> /atm/24 hr	370 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 100°F (38°C), 2.00 mil (50.8 µm), 100% RH	1.6 g·mil/100in <sup>2</sup> /at m/24 hr	0.62 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)	3300 cm <sup>3</sup> ·mil/100in <sup>2</sup> /atm/24 hr	1300 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	183 °F	83.9 °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)	54	54	
45°, 0.800 mil (20.3 µm)	48	48	
Clarity			ASTM D1746
2.00 mil (50.8 µm)	85.0	85.0	
0.800 mil (20.3 µm)	93.0	93.0	
Haze			ASTM D1003
2.00 mil (50.8 µm)	6.0 %	6.0 %	
0.800 mil (20.3 µm)	5.0 %	5.0 %	

### Extrusion Notes

Fabrication Conditions For Blown Film:

- Screw Size: 2.5 in. (63.5 mm); 24:1 L/D
- Screw Type: DSB 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. (635 mm)

### 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 2.0 mil film achieves 2 lb/in. (8.8 N/25.4 mm) heat seal strength.  
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 0.8 mil film achieves 1 lb/in. (4.4 N/25.4 mm) heat seal strength.  
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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Published: 1995-11-01

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