

## Mirafi<sup>®</sup> 135N

Mirafi<sup>®</sup> 135N is a nonwoven geotextile composed of polypropylene fibers, which are formed into a stable network such that the fibers retain their relative position. 135N is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids.

Mechanical Properties	Test Method	Unit	Minimum Average Roll Value	
			MD	CD
Grab Tensile Strength	ASTM D 4632	kN (lbs)	0.36 (80)	0.36 (80)
Grab Tensile Elongation	ASTM D 4632	%	50	50
Trapezoid Tear Strength	ASTM D 4533	kN (lbs)	0.13 (30)	0.13 (30)
Mullen Burst Strength	ASTM D 3786	kPa (psi)	1000 (145)	
Puncture Strength	ASTM D 4833	kN (lbs)	0.17 (40)	
Apparent Opening Size (AOS)	ASTM D 4751	mm (U.S. Sieve)	0.300 (50)	
Permittivity	ASTM D 4491	sec <sup>-1</sup>	2.1	
Permeability	ASTM D 4491	cm/sec	0.21	
Flow Rate	ASTM D 4491	l/min/m <sup>2</sup> (gal/min/ft <sup>2</sup> )	6336 (155)	
UV Resistance (at 500 hours)	ASTM D 4355	% strength retained	70	

Physical Properties	Test Method	Unit	Typical Value	
Weight	ASTM D 5261	g/m <sup>2</sup> (oz/yd <sup>2</sup> )	108 (3.2)	
Thickness	ASTM D 5199	mm (mils)	0.9652 (38)	
Roll Dimensions (width x length)	--	m (ft)	3.8 x 110 (12.5 x 360)	4.5 x 110 (15 x 360)
Roll Area	--	m <sup>2</sup> (yd <sup>2</sup> )	418 (500)	502 (600)
Estimated Roll Weight	--	kg (lb)	52 (114)	62 (137)

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# Mirafi<sup>®</sup> 160N

Mirafi<sup>®</sup> 160N is a nonwoven geotextile composed of polypropylene fibers, which are formed into a stable network such that the fibers retain their relative position. 160N is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids.

Mechanical Properties	Test Method	Unit	Minimum Average Roll Value	
			MD	CD
Grab Tensile Strength	ASTM D 4632	kN (lbs)	0.71 (160)	0.71 (160)
Grab Tensile Elongation	ASTM D 4632	%	50	50
Trapezoid Tear Strength	ASTM D 4533	kN (lbs)	0.27 (60)	0.27 (60)
Mullen Burst Strength	ASTM D 3786	kPa (psi)	2100 (305)	
Puncture Strength <sup>†</sup>	ASTM D 4833	kN (lbs)	0.42 (95)	
CBR Puncture Strength	ASTM D 6241	kN (lbs)	1.78 (400)	
Apparent Opening Size (AOS)	ASTM D 4751	mm (U.S. Sieve)	0.212 (70)	
Permittivity	ASTM D 4491	sec <sup>-1</sup>	1.4	
Permeability	ASTM D 4491	cm/sec	0.22	
Flow Rate	ASTM D 4491	l/min/m <sup>2</sup> (gal/min/ft <sup>2</sup> )	4477 (110)	
UV Resistance (at 500 hours)	ASTM D 4355	% strength retained	70	

<sup>†</sup> ASTM D 4833 has been replaced with ASTM D 6241

Physical Properties	Test Method	Unit	Typical Value
Weight	ASTM D 5261	g/m <sup>2</sup> (oz/yd <sup>2</sup> )	217 (6.4)
Thickness	ASTM D 5199	mm (mils)	1.9 (75)
Roll Dimensions (width x length)	--	m (ft)	4.5 x 91 (15 x 300)
Roll Area	--	m <sup>2</sup> (yd <sup>2</sup> )	418 (500)
Estimated Roll Weight	--	kg (lb)	99 (217)

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# Mirafi<sup>®</sup> 140NL

Mirafi<sup>®</sup> 140NL is a nonwoven geotextile composed of polypropylene fibers, which are formed into a network such that the fibers retain their relative position. 140NL is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids.

Mechanical Properties	Test Method	Unit	Minimum Average Roll Value	
			MD	CD
Grab Tensile Strength	ASTM D 4632	kN (lbs)	0.4 (90)	0.4 (90)
Grab Tensile Elongation	ASTM D 4632	%	50	50
Trapezoid Tear Strength	ASTM D 4533	kN (lbs)	0.178 (40)	0.178 (40)
Mullen Burst Strength	ASTM D 3786	kPa (psi)	1205 (175)	
Puncture Strength <sup>1</sup>	ASTM D 4833	kN (lbs)	0.24 (55)	
CBR Puncture Strength	ASTM D 6241	kN (lbs)	1.11 (250)	
Apparent Opening Size (AOS)	ASTM D 4751	mm (U.S. Sieve)	0.25 (60)	
Permittivity	ASTM D 4491	sec <sup>-1</sup>	2.0	
Permeability	ASTM D 4491	cm/sec	0.20	
Flow Rate	ASTM D 4491	l/min/m <sup>2</sup> (gal/min/ft <sup>2</sup> )	5907 (145)	
UV Resistance (at 500 hours)	ASTM D 4355	% strength retained	70	

<sup>1</sup> ASTM D 4833 has been replaced with ASTM D 6241

Physical Properties	Test Method	Unit	Typical Value	
Weight	ASTM D 5261	g/m <sup>2</sup> (oz/yd <sup>2</sup> )	129 (3.8)	
Thickness	ASTM D 5199	mm (mils)	1.3 (50)	
Roll Dimensions (width x length)	--	m (ft)	3.8 x 110 (12.5 x 360)	4.5 x 110 (15 x 360)
Roll Area	--	m <sup>2</sup> (yd <sup>2</sup> )	418 (500)	502 (600)
Estimated Roll Weight	--	kg (lb)	60 (133)	70 (160)

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# Mirafi<sup>®</sup> 140NC

Mirafi<sup>®</sup> 140NC is a nonwoven geotextile composed of polypropylene fibers, which are formed into a stable network such that the fibers retain their relative position. 140NC is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids.

Mechanical Properties	Test Method	Unit	Minimum Average Roll Value	
			MD	CD
Grab Tensile Strength	ASTM D 4632	kN (lbs)	0.45 (100)	0.45 (100)
Grab Tensile Elongation	ASTM D 4632	%	60	60
Toughness	Grab Tensile Strength x Elongation	lbs	6000	
Trapezoid Tear Strength	ASTM D 4533	kN (lbs)	0.20 (45)	0.20 (45)
Mullen Burst Strength	ASTM D 3786	kPa (psi)	1447 (210)	
Puncture Strength <sup>1</sup>	ASTM D 4833	kN (lbs)	0.30 (65)	
CBR Puncture Strength	ASTM D 6241	kN (lbs)	1.11 (250)	
Apparent Opening Size (AOS)	ASTM D 4751	mm (U.S. Sieve)	0.212 (70)	
Permittivity	ASTM D 4491	sec <sup>-1</sup>	1.9	
Permeability	ASTM D 4491	cm/sec	0.21	
Flow Rate	ASTM D 4491	l/min/m <sup>2</sup> (gal/min/ft <sup>2</sup> )	5704 (140)	
Mass / Unit Area	ASTM D 5261	g/m <sup>2</sup> (oz/yd <sup>2</sup> )	136 (4.0)	
UV Resistance (at 500 hours)	ASTM D 4355	% strength retained	70	

<sup>1</sup> ASTM D 4833 has been replaced with ASTM D 6241

Physical Properties	Test Method	Unit	Typical Value	
Thickness	ASTM D 5199	mm (mils)	1.1 (42)	
Roll Dimensions (width x length)	--	m (ft)	3.8 x 110 (12.5 x 360)	4.5 x 110 (15 x 360)
Roll Area	--	m <sup>2</sup> (yd <sup>2</sup> )	418 (500)	502 (600)
Estimated Roll Weight	--	kg (lb)	69 (152)	83 (182)

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## Mirafi<sup>®</sup> 140N

Mirafi<sup>®</sup> 140N is a nonwoven geotextile composed of polypropylene fibers, which are formed into a stable network such that the fibers retain their relative position. 140N is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids.

Mechanical Properties	Test Method	Unit	Minimum Average Roll Value	
			MD	CD
Grab Tensile Strength	ASTM D 4632	kN (lbs)	0.53 (120)	0.53 (120)
Grab Tensile Elongation	ASTM D 4632	%	50	50
Trapezoid Tear Strength	ASTM D 4533	kN (lbs)	0.22 (50)	0.22 (50)
Mullen Burst Strength	ASTM D 3786	kPa (psi)	1550 (225)	
Puncture Strength <sup>1</sup>	ASTM D 4833	kN (lbs)	0.30 (65)	
CBR Puncture Strength	ASTM D 6241	kN (lbs)	1.33 (300)	
Apparent Opening Size (AOS)	ASTM D 4751	mm (U.S. Sieve)	0.212 (70)	
Permittivity	ASTM D 4491	sec <sup>-1</sup>	1.8	
Permeability	ASTM D 4491	cm/sec	0.21	
Flow Rate	ASTM D 4491	l/min/m <sup>2</sup> (gal/min/ft <sup>2</sup> )	5500 (135)	
UV Resistance (at 500 hours)	ASTM D 4355	% strength retained	70	

<sup>1</sup> ASTM D 4833 has been replaced with ASTM D 6241

Physical Properties	Test Method	Unit	Typical Value	
Weight	ASTM D 5261	g/m <sup>2</sup> (oz/yd <sup>2</sup> )	163 (4.8)	
Thickness	ASTM D 5199	mm (mils)	1.4 (55)	
Roll Dimensions (width x length)	--	m (ft)	3.8 x 110 (12.5 x 360)	4.5 x 110 (15 x 360)
Roll Area	--	m <sup>2</sup> (yd <sup>2</sup> )	418 (500)	502 (600)
Estimated Roll Weight	--	kg (lb)	74 (164)	89 (197)

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## Mirafi<sup>®</sup> 180N

Mirafi<sup>®</sup> 180N is a nonwoven geotextile composed of polypropylene fibers, which are formed into a stable network such that the fibers retain their relative position. 180N is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids.

Mechanical Properties	Test Method	Unit	Minimum Average Roll Value	
			MD	CD
Grab Tensile Strength	ASTM D 4632	kN (lbs)	0.9 (205)	0.9 (205)
Grab Tensile Elongation	ASTM D 4632	%	50	50
Trapezoid Tear Strength	ASTM D 4533	kN (lbs)	0.36 (80)	0.36 (80)
Mullen Burst Strength	ASTM D 3786	kPa (psi)	2618 (380)	
Puncture Strength <sup>1</sup>	ASTM D 4833	kN (lbs)	0.58 (130)	
CBR Puncture Strength	ASTM D 6241	kN (lbs)	2.22 (500)	
Apparent Opening Size (AOS)	ASTM D 4751	mm (U.S. Sieve)	0.180 (80)	
Permittivity	ASTM D 4491	sec <sup>-1</sup>	1.2	
Permeability	ASTM D 4491	cm/sec	0.21	
Flow Rate	ASTM D 4491	l/min/m <sup>2</sup> (gal/min/ft <sup>2</sup> )	3866 (95)	
UV Resistance (at 500 hours)	ASTM D 4355	% strength retained	70	

<sup>1</sup> ASTM D 4833 has been replaced with ASTM D 6241

Physical Properties	Test Method	Unit	Typical Value
Weight	ASTM D 5261	g/m <sup>2</sup> (oz/yd <sup>2</sup> )	278 (8.2)
Thickness	ASTM D 5199	mm (mils)	2.1 (82.5)
Roll Dimensions (width x length)	--	m (ft)	4.5 x 91 (15 x 300)
Roll Area	--	m <sup>2</sup> (yd <sup>2</sup> )	418 (500)
Estimated Roll Weight	--	kg (lb)	124 (273)

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# Mirafi<sup>®</sup> 1120N

Mirafi<sup>®</sup> 1120N is a nonwoven geotextile composed of polypropylene fibers, which are formed into a stable network such that the fibers retain their relative position. 1120N is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids.

Mechanical Properties	Test Method	Unit	Minimum Average Roll Value	
			MD	CD
Grab Tensile Strength	ASTM D 4632	kN (lbs)	1.34 (300)	1.34 (300)
Grab Tensile Elongation	ASTM D 4632	%	50	50
Trapezoid Tear Strength	ASTM D 4533	kN (lbs)	0.51 (115)	0.51 (115)
Mullen Burst Strength	ASTM D 3786	kPa (psi)	4030 (585)	
Puncture Strength <sup>1</sup>	ASTM D 4833	kN (lbs)	0.78 (175)	
CBR Puncture Strength	ASTM D 6241	kN (lbs)	3.56 (800)	
Apparent Opening Size (AOS)	ASTM D 4751	mm (U.S. Sieve)	0.150 (100)	
Permittivity	ASTM D 4491	sec <sup>-1</sup>	0.8	
Permeability	ASTM D 4491	cm/sec	0.18	
Flow Rate	ASTM D 4491	l/min/m <sup>2</sup> (gal/min/ft <sup>2</sup> )	2648 (65)	
UV Resistance (at 500 hours)	ASTM D 4355	% strength retained	70	

<sup>1</sup> ASTM D 4833 has been replaced with ASTM D 6241

Physical Properties	Test Method	Unit	Typical Value
Weight	ASTM D 5261	g/m <sup>2</sup> (oz/yd <sup>2</sup> )	400 (11.8)
Thickness	ASTM D 5199	mm (mils)	3.0 (120)
Roll Dimensions (width x length)	--	m (ft)	4.5 x 91 (15 x 300)
Roll Area	--	m <sup>2</sup> (yd <sup>2</sup> )	418 (500)
Estimated Roll Weight	--	kg (lb)	175 (386)

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# Mirafi<sup>®</sup> 1100N

Mirafi<sup>®</sup> 1100N is a nonwoven geotextile composed of polypropylene fibers, which are formed into a stable network such that the fibers retain their relative position. 1100N is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids.

Mechanical Properties	Test Method	Unit	Minimum Average Roll Value	
			MD	CD
Grab Tensile Strength	ASTM D 4632	kN (lbs)	1.11 (250)	1.11 (250)
Grab Tensile Elongation	ASTM D 4632	%	50	50
Trapezoid Tear Strength	ASTM D 4533	kN (lbs)	0.45 (100)	0.45 (100)
Mullen Burst Strength	ASTM D 3786	kPa (psi)	3445 (500)	
Puncture Strength <sup>1</sup>	ASTM D 4833	kN (lbs)	0.69 (155)	
CBR Puncture Strength	ASTM D 6241	kN (lbs)	3.11 (700)	
Apparent Opening Size (AOS)	ASTM D 4751	mm (U.S. Sieve)	0.150 (100)	
Permittivity	ASTM D 4491	sec <sup>-1</sup>	1.0	
Permeability	ASTM D 4491	cm/sec	0.20	
Flow Rate	ASTM D 4491	l/min/m <sup>2</sup> (gal/min/ft <sup>2</sup> )	3056 (75)	
UV Resistance (at 500 hours)	ASTM D 4355	% strength retained	70	

<sup>1</sup>ASTM D 4833 has been replaced with ASTM D 6241

Physical Properties	Test Method	Unit	Typical Value
Weight	ASTM D 5261	g/m <sup>2</sup> (oz/yd <sup>2</sup> )	349 (10.3)
Thickness	ASTM D 5199	mm (mils)	2.5 (100)
Roll Dimensions (width x length)	--	m (ft)	4.5 x 91 (15 x 300)
Roll Area	--	m <sup>2</sup> (yd <sup>2</sup> )	418 (500)
Estimated Roll Weight	--	kg (lb)	154 (339)

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# Mirafi<sup>®</sup> 1160N

Mirafi<sup>®</sup> 1160N is a nonwoven geotextile composed of polypropylene fibers, which are formed into a stable network such that the fibers retain their relative position. 1160N is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids.

Mechanical Properties	Test Method	Unit	Minimum Average Roll Value	
			MD	CD
Grab Tensile Strength	ASTM D 4632	kN (lbs)	1.69 (380)	1.69 (380)
Grab Tensile Elongation	ASTM D 4632	%	50	50
Trapezoid Tear Strength	ASTM D 4533	kN (lbs)	0.62 (140)	0.62 (140)
Mullen Burst Strength	ASTM D 3786	kPa (psi)	5098 (740)	
Puncture Strength <sup>1</sup>	ASTM D 4833	kN (lbs)	1.05 (235)	
CBR Puncture Strength	ASTM D 6241	kN (lbs)	4.45 (1000)	
Apparent Opening Size (AOS)	ASTM D 4751	mm (U.S. Sieve)	0.150 (100)	
Permittivity	ASTM D 4491	sec <sup>-1</sup>	0.7	
Permeability	ASTM D 4491	cm/sec	0.20	
Flow Rate	ASTM D 4491	l/min/m <sup>2</sup> (gal/min/ft <sup>2</sup> )	2037 (50)	
UV Resistance (at 500 hours)	ASTM D 4355	% strength retained	70	

<sup>1</sup> ASTM D 4833 has been replaced with ASTM D 6241

Physical Properties	Test Method	Unit	Typical Value
Weight	ASTM D 5261	g/m <sup>2</sup> (oz/yd <sup>2</sup> )	492 (14.5)
Thickness	ASTM D 5199	mm (mils)	4.1 (161)
Roll Dimensions (width x length)	--	m (ft)	4.5 x 45 (15 x 150)
Roll Area	--	m <sup>2</sup> (yd <sup>2</sup> )	209 (250)
Estimated Roll Weight	--	kg (lb)	110 (243)

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