



## Technical Bulletin: Nonwoven & Woven Geotextiles

### Introduction

June 25, 2024

Atlantic Industries Limited (AIL) offers a variety of geotextile products designed to meet the needs of various civil engineering and construction projects. Geotextiles play a crucial role in improving the performance, durability and sustainability of civil engineering and construction projects by providing solutions for soil drainage, filtration, separation, confinement, reinforcement and other functions. The following sections present an overview of the geotextile products offered by AIL.



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# NONWOVEN GEOTEXTILES

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## Product Specifications

MECHANICAL PROPERTIES	UNIT	AIL4NC	AIL4N	AIL6N	AIL8N
Grab Tensile Strength	lbs (N)	100 (444)	120 (533)	160 (711)	205 (911)
Grab Tensile Elongation	%	50	50	50	50
Trapezoid Tear Strength	lbs (N)	45 (200)	50 (222)	60 (267)	80 (356)
CBR Puncture Strength	lbs (N)	250 (1113)	310 (1380)	400 (1780)	500 (2224)
HYDRAULIC PROPERTIES					
Flow Rate	gal/min/ft <sup>2</sup> (l/min/m <sup>2</sup> )	140 (5704)	120 (4885)	110 (4481)	95 (3870)
Permittivity	sec <sup>-1</sup>	2	1.7	1.5	1.4
Apparent Opening Size (AOS) Maximum Opening Size	US Sieve (mm)	70 (0.212)	70 (0.212)	70 (0.212)	80 (0.18)
UV Resistance (at 500 hours) Minimum Test Value	% strength retained	70	70	80	70
PHYSICAL PROPERTIES					
Roll Dimensions (width x length)	ft (m)	15 x 360 (4.57 x 110)	15 x 360 (4.57 x 110)	15 x 300 (4.57 x 91.4)	15 x 300 (4.57 x 91.4)
Roll Area	yd <sup>2</sup> (m <sup>2</sup> )	600 (502)	600 (502)	500 (418)	500 (418)
Roll Weight	lbs (kg)	170 (77)	190 (80)	210 (98)	260 (118)

## Functions

- ▶ **Drainage** - The process of removing excess water from soil to prevent water pooling and soil saturation.
- ▶ **Filtration** - The ability of a geotextile to allow water to pass through while retaining soil particles to ensure that soil particles are not lost during drainage.
- ▶ **Separation** - Preventing the mixing of different soil layers to maintain the soil integrity and stability.

## Applications

Recommended applications for nonwoven geotextiles include:

- ▶ Covering or wrapping French drains
- ▶ Separation filtration for construction and landscaping projects
- ▶ Gravel driveways
- ▶ Road construction in wet climates

**Lightweight vs Heavyweight:**

- ▶ Lightweight nonwovens are best suited for subsurface drainage applications such as roadways, embankments, etc.
- ▶ Heavyweight nonwovens provide greater strength and abrasion resistance, which are better suited for more harsh conditions, such as underneath riprap and revetment applications



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# WOVEN GEOTEXTILES

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## Product Specifications

MECHANICAL PROPERTIES	UNIT	AIL5XW	AIL6XW
Grab Tensile Strength	lbs (N)	200 (889)	315 (1402)
Grab Tensile Elongation	%	15	15
Trapezoid Tear Strength	lbs (N)	70 (333)	120 (533)
CBR Puncture Strength	lbs (N)	700 (3115)	900 (4005)
HYDRAULIC PROPERTIES			
Flow Rate	gal/min/ft <sup>2</sup> (l/min/m <sup>2</sup> )	4 (163)	4 (163)
Permittivity	sec <sup>-1</sup>	0.05	0.05
Apparent Opening Size (AOS) Maximum Opening Size	US Sieve (mm)	40 (0.425)	40 (0.425)
UV Resistance (at 500 hours) Minimum Test Value	% strength retained	70	70
PHYSICAL PROPERTIES			
Roll Dimensions (width x length)	ft (m)	15 x 360 (4.57 x 110)	15 x 300 (4.57 x 91.4)
Roll Area	yd <sup>2</sup> (m <sup>2</sup> )	600 (502)	500 (418)
Roll Weight	lbs (kg)	177 (80)	230 (105)

## Functions

- ▶ **Separation** - Preventing the mixing of different soil layers to maintain the soil integrity and stability.
- ▶ **Filtration (FW Series)** - The ability of a geotextile to allow water to pass through while retaining soil particles to ensure that soil particles are not lost during drainage.

## Applications

Recommended applications for woven geotextiles include:

- ▶ Beneath driveways and parking areas
- ▶ Road constructions, both temporary and long-term
- ▶ High-load capacity areas
- ▶ Wovens are stronger than nonwovens in a comparable fabric; however, wovens are not typically recommended for drainage applications due to their low permeability



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# HIGH PERFORMANCE WOVEN GEOTEXTILES

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## Product Specifications

MECHANICAL PROPERTIES	UNIT	AIL90	AIL100	AIL120
Grab Tensile Strength	lbs (N)	295 (1313)	400 (1780)	500 (2225)
Grab Tensile Elongation	%	13	10	11
Trapezoid Tear Strength	lbs (N)	110 (490)	135 (601)	180 (801)
CBR Puncture Strength	lbs (N)	1000 (4450)	1450 (6453)	2000 (8900)
HYDRAULIC PROPERTIES				
Flow Rate	gal/min/ft <sup>2</sup> (l/min/m <sup>2</sup> )	40 (1630)	40 (1630)	30 (1222)
Permittivity	sec <sup>-1</sup>	0.6	0.9	0.4
Apparent Opening Size (AOS) Maximum Opening Size	US Sieve (mm)	30 (0.60)	40 (0.425)	30 (0.60)
UV Resistance (at 500 hours) Minimum Test Value	% strength retained	80	80	80
PHYSICAL PROPERTIES				
Roll Dimensions (width x length)	ft (m)	15 x 300 (4.57 x 91.4)	15 x 300 (4.57 x 91.4)	15 x 300 (4.57 x 91.4)
Roll Area	yd <sup>2</sup> (m <sup>2</sup> )	500 (418)	500 (418)	500 (418)

## Functions

- ▶ **Reinforcement** – The enhancement of the mechanical properties of soil to increase the strength and stability of the soil.
- ▶ **Confinement** – The ability of a geotextile to restrain lateral movement from soil through friction or mechanical interlock.
- ▶ **Separation** – Preventing the mixing of different soil layers to maintain the soil integrity and stability.
- ▶ **Filtration** – The ability of a geotextile to allow water to pass through while retaining soil particles to ensure that critical soil particles are not lost during drainage.

## Applications

Recommended applications for high performance woven geotextiles include:

- ▶ Reinforcement for soft subgrade and weak foundation soil
- ▶ Reinforcement for mechanically stabilized earth (MSE) structures
- ▶ Embankment stabilization

In the right application, there is an opportunity for AIL high-performance geotextiles to reduce gravel cross sections from an unreinforced roadway to a reinforced roadway. This solution could provide significant cost and time savings on your project!



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# SUMMARY

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## Summary

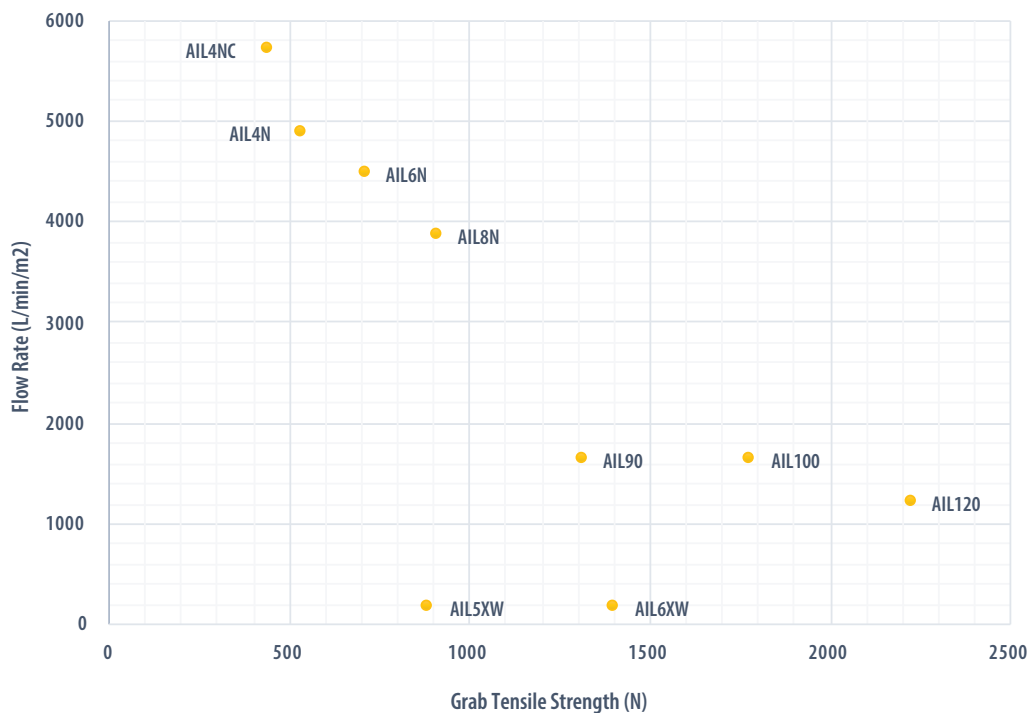
When determining the most suitable geotextile product for a specific project, consider the following table as a guide:

FUNCTION	NONWOVEN	WOVEN	HIGH-PERFORMANCE WOVEN
Drainage	✓	✗	–
Filtration	✓	–	✓
Separation	✓	✓	✓
Reinforcement	✗	✗	✓
Confinement	✗	✗	✓

Performance Legend: ✓ (Excellent) – (Moderate) ✗ (Poor)

Once you've determined the most suitable type of geotextile from the table above, you may use the product specifications tables or consult with an AIL sales representative to confirm which specific AIL geotextile product is most suitable for your application.

### AIL GEOTEXTILE PRODUCTS



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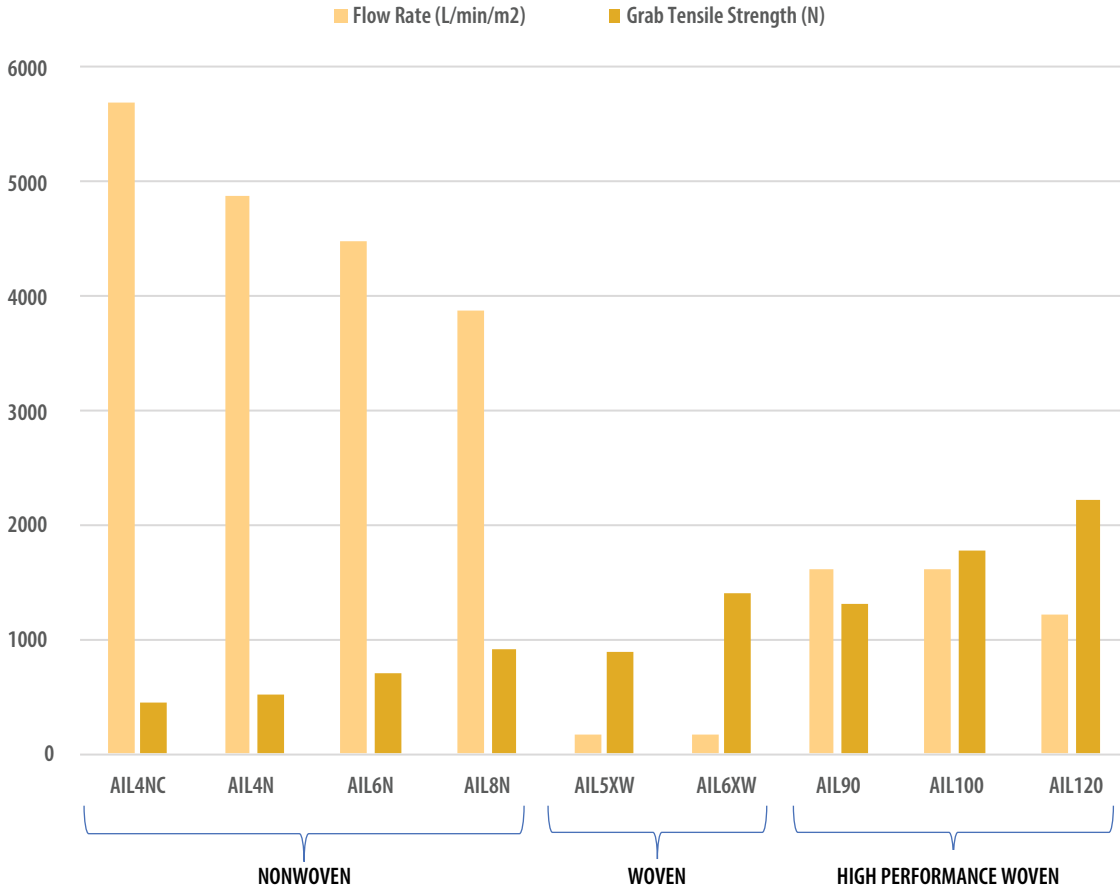
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# SUMMARY

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### AIL GEOTEXTILE PRODUCTS



- ▶ Geotextiles with higher permeability are best suited for soil drainage applications where water pooling is a concern.
- Geotextiles with higher strength are better suited for more severe or extremely harsh conditions, such as rip-rap and revetment applications. Higher-strength geotextiles may also be required for soil reinforcement applications where soft subgrade and weak foundation soils are a concern.



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