



PFS TECO Research Report 0110

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Page: 1 of 9

TYPE OF ACCEPTANCE: Product Material - Wood and Plastics
CSI Specification Division 060000 (Structural Plastic) and Section 065300
(Plastic Decking)

MANUFACTURER IDENTIFICATION: Advanced Environmental Recycling Technologies, Inc. (AERT)
914 North Jefferson Street
Springdale, AR 72764
1-479-756-7400
www.aert.com

RESEARCH REPORT SUBJECT: AERT, Inc., Deck Boards and Stair Treads for Exterior Applications
Installation on construction complying with International Residential Code (IRC)
or complying with International Building Code (IBC) Structures.

DESCRIPTION OF BUILDING COMPONENTS:

A. Deckboards

AERT, Inc., deck boards are wood thermoplastic composite lumber (WTCL) product consisting of plastic, wood filler plus additives and color. The product specifications are listed in the approved quality control manual. The AERT, Inc., deck board components are manufactured in several colors by the mono-extrusion process (except for the **MoistureShield® Pro**, **MoistureShield® Refine** and **MoistureShield® Infuse** deck boards that are co-extruded). **MoistureShield® Pro**, **Lifecycle® Basics**, **MoistureShield® Infuse**, **MoistureShield® Refine** and **ChoiceDek™** deck boards can have capping covering three sides of the deck board.

1. Deck Boards: Solid

- (a) The **MoistureShield®** deck board is rectangular (1" x 5") in shape, has rounded edges and is completely solid. See attached drawing in Table 1. This deck board is also named **ModernView™**, **MoistureShield® Vision** and **Essential Collection®**.
- (b) The **MoistureShield®** deck board is rectangular (1" x 5.4") in shape, has rounded edges and is completely solid. See attached drawing in Table 1. This deck board is also named **Vantage Collection®**, **Vantage Collection® FR**, **Lifecycle® Vantage**, **LifeCycle® MoistureShield®** and **MoistureShield® Vision**.
- (c) The **MoistureShield®** deck board is rectangular (1.10" x 5.4") in shape, has rounded edges, is completely solid. See attached drawing in Table 1. This deck board is also named **MoistureShield® FR**, **Elite Collection®**, and **ChoiceDek™ FR**.
- (d) The **MoistureShield®** deck board is rectangular (1.5" x 3.5") in shape, has rounded edges and is completely solid. This deck board is also used as a guardrail profile. See attached drawing in Table 1. This deck board is also named **ChoiceDek™**, **ChoiceDek™ Foundations**, **ChoiceDek™ Premium**, **MoistureShield® Vision**, **MoistureShield® Vantage Collection®**, **MoistureShield® Elite** and **Lifecycle® Basics**.
- (e) The **MoistureShield®** deck board is rectangular (1.4" x 5.4") in shape, has rounded edges and is completely solid. See attached drawing in Table 1. This deck board is also named **Lifecycle® Basics**, **ChoiceDek™**, **MoistureShield® Vision**, **MoistureShield® Vantage Collection®**, **ChoiceDek™ Premium**, **ChoiceDek™ FR**, **MoistureShield® Elite** and **MoistureShield® FR**.
- (f) The **MoistureShield®** deck board is rectangular (1.4" x 7.25") in shape, has rounded edges and is completely solid. See attached drawing in Table 1. This deck board is also named **ChoiceDek™**, **ChoiceDek™ Premium**, **MoistureShield® Vision**, **MoistureShield® Vantage Collection®**, **MoistureShield® Elite** and **Lifecycle® Basics**.

- (g) The **MoistureShield®** deck board is rectangular (1" x 5.4") in shape, has rounded edges, is completely solid and has a proprietary polymer capstock that covers three (3) sides of the deck board. See attached drawing in Table 1. This deck board is also named **ChoiceDek™**, **MoistureShield® Refine**, **MoistureShield® Infuse** and **MoistureShield® Pro**.
- (h) The **MoistureShield®** deck board is rectangular (0.83" x 5.4") in shape, has rounded edges and is completely solid. See attached drawing in Table 1. This deck board is also named **ModernView™**, **MoistureShield® Vision**, **LifeCycle® by MoistureShield®** and **LifeCycle® Elite by MoistureShield®**.

2. Deck Boards: Solid with Lobes (Oval and Square)

- (a) The **MoistureShield®** deck board with three (3) oval lobes on the bottom is rectangular (1' x 5") in shape, has rounded edges and is completely solid. See attached drawing in Table 1. This deck board is also named **MoistureShield® Vision**, **LifeCycle® Premium**, **MoistureShield® Basics** and **LifeCycle® Basics**.
- (b) The **ChoiceDek™** deck board with three (3) oval lobes is rectangular (1" x 5.4") in shape, has rounded edges and is completely solid. See attached drawing in Table 1. This deck board is also named **ChoiceDek™ Foundations**, and **ChoiceDek™ Premium**.
- (c) The **ChoiceDek™** deck board with three (3) oval lobes is rectangular (1.175" x 5.4") in shape, has rounded edges and is completely solid. See attached drawing in Table 1.
- (d) The **MoistureShield®** deck board with three (3) square lobes is rectangular (1.175" x 5.4") in shape, has rounded edges and is completely solid. See attached drawing in Table 1. This deck board is also named **LifeCycle® Basics**.
- (e) The **MoistureShield®** deck board with three (3) square lobes is rectangular (1.5" x 5.5") in shape, has rounded edges and is completely solid. See attached drawing in Table 1. This deck board is also named **LifeCycle® Basics**.
- (f) The **MoistureShield®** deck board with seven (7) oval lobes is rectangular (0.83" x 5.4") in shape, has rounded edges and is completely solid. See attached drawing in Table 1. This deck board is also named **ModernView™**, **MoistureShield® Vision**, **LifeCycle® by MoistureShield®** and **LifeCycle® Euro by MoistureShield®**.

3. Deck Boards: Solid with Side Grooves

- (a) The **MoistureShield®** deck board is rectangular (1" x 5.0") in shape, has rounded edges, is completely solid and has a groove on each side of the board. See attached drawing in Table 1. This deck board is also named **MoistureShield® Vision**, **ModernView™** and **Essential Collection®**.
- (b) The **MoistureShield®** deck board is rectangular (1" x 5.4") in shape, has rounded edges, is completely solid and has a groove on each side of the board. See attached drawing in Table 1. This deck board is also named **MoistureShield® Vision**, **Vantage Collection®** and **MoistureShield® Infuse**.
- (c) The **MoistureShield®** deck board is rectangular (1" x 5.4") in shape, has rounded edges, is completely solid, has a groove on each side of the board and has a proprietary polymer capstock on the top of the board. See attached drawing in Table 1. This deck board is also named **MoistureShield Pro®**, **MoistureShield® Refine** and **ChoiceDek™**.
- (d) The **MoistureShield®** deck board is rectangular (0.83" x 5.4") in shape, has rounded edges, is completely solid and has a groove on each side of the board. See attached drawing in Table 1. This deck board is also named **ModernView™**, **MoistureShield® Vision**, **LifeCycle® by MoistureShield®** and **LifeCycle® Elite by MoistureShield®**.

4. Deck Boards: Solid with Side Grooves and Lobes (Oval and Square)

- (a) The **MoistureShield®** deck board is rectangular (1" x 5.0") in shape, has rounded edges, is completely solid, has three lobes on the bottom and has a groove on each side of the board. See attached drawing in

Table 1. This deck board is also named **ModernView™**, **MoistureShield® Vision** and **Essential Collection®**.

- (b) The **MoistureShield®** deck board is rectangular (1" x 5.4") in shape, has rounded edges, is completely solid, has three lobes on the bottom and has a groove on each side of the board. See attached drawing in Table 1. This deck board is also named **MoistureShield® Vision**, **ChoiceDek™**, **ChoiceDek™ Foundations**, **CD Premium**, and **LifeCycle® Basics**.
- (c) The **MoistureShield®** deck board is rectangular (0.83" x 5.4") in shape, has rounded edges, is completely solid, has seven lobes on the bottom and has a groove on each side of the board. See attached drawing in Table 1. This deck board is also named **ModernView™**, **MoistureShield® Vision**, **LifeCycle® by MoistureShield®** and **LifeCycle® Euro by MoistureShield®**.
5. AERT, Inc., deck boards must be installed perpendicular to supporting construction at maximum span. Deck boards can be used as stair treads and must be installed perpendicular to the supporting construction. The decking and stair tread must be installed with a minimum gap of 3/16 inch between parallel boards for drainage and decking must be installed with a minimum 1/8-inch space provided at each end of the board. See manufacturer's installation instructions noted item 6 below.
6. For additional decking installation details see manufacturer's published installation instructions as follows: MoistureShield decking dated June 2015, MoistureShield decking clips dated April 2015, ChoiceDek decking dated May 2013 and LifeCycle decking dated June 2011.

APPLICABLE CODES:

- 2015 *International Building Code®* (IBC)
- 2012 *International Building Code®* (IBC)
- 2009 *International Building Code®* (IBC)
- 2006 *International Building Code®* (IBC)
- 2015 *International Residential Code®* (IRC)
- 2012 *International Residential Code®* (IRC)
- 2009 *International Residential Code®* (IRC)
- 2006 *International Residential Code®* (IRC)

APPLICABLE CHARACTERISTICS REVIEWED:

B. Deck Board(s) – “See Section A – 1 thru 4 above for list of all the names and descriptions of the deck boards reviewed.

1. Deck Board: Structural Performance

- (a) The deck boards have been reviewed for uniform load, maximum span and deck board direction when installed on support framing members. See attached Table 1.
- (b) The deck boards have been reviewed for wind uplift resistance and have an uplift load rating when installed as indicated in Table 1 in this report.
- (c) The deck boards used as stair treads meet the code prescribed load requirements including the concentrated load of 300 lbf when installed in accordance with the manufacturers' installation instructions and Table 1 in this report. Deck boards and stair treads must be installed perpendicular to supporting members.

2. Deck Board: Fastening

- (a) Solid Deck Boards, including those with lobes, side grooves and side grooves and lobes must be fastened to the structural supporting members in accordance with the manufacturer's installation instructions and Table 1 in this report. When manufacturer's installation instructions differ from this report, this report governs.

- (b) The deck board attachment to structural supporting members is outlined in the manufacturers' installation instructions and Table 1 of this report. When the manufacturer's installation instructions differ from this report, this report governs.
- (c) When deck boards are used as stair treads, they must be installed in accordance with the manufacturer's installation instructions and Table 1 in this report. When the manufacturer's installation instructions differ from this report, this report governs. Review of the structural design for code compliance of supporting members, have not been evaluated and is not a part of this research report.

3. Deck Board Durability: Temperature

- (a) The deck boards have been reviewed for the temperature range of -20 degrees F (-29 degrees C) to +125 degrees F (52 degrees C).

4. Deck Board Flame Spread Index:

- (a) The flame spread rating for the deck boards, described in this report was less than 200 when tested with ASTM E84 "Standard Test Method for Surface Burning Characteristics of Building Materials."

5. Deck Board Decay Resistance:

- (a) The deck boards reviewed for this report have been deemed comparable to naturally durable wood for resistance to fungal decay.

6. Deck Board Termite Resistance:

- (a) The deck boards reviewed for this report have been deemed comparable to preservative treated wood for resistance to termite attack.

7. UV Testing:

- (a) The UV testing was conducted and an appropriate adjustment factor was applied in accordance with ASTM D 7032-10 "Standard for Establishing Performance Ratings for Wood-Plastic Composite Deck Boards and Guardrail Systems (Guards or Handrails)".

APPLICABLE USES:

The AERT, Inc., deck boards evaluated in this report are limited to exterior applications for balconies, porches, stair treads, walking surfaces and decks.

LIMITATIONS OF ACCEPTANCE:

The AERT, Inc., deck boards and guardrails described in this report comply with those codes listed in Applicable Codes section above and are subject to the following conditions:

1. The deck board products must be limited to Type V-B (IBC) and residential construction in accordance with the IRC construction for exterior use as a deck board for balconies, porches, decks and stair treads.
2. Installation of the deck boards must comply with this report, the manufacturer's published installation instructions (see A-6 above), and the applicable code. When deck board manufacturer's installation instructions differ from this report, this report governs.
3. The fasteners described in this report have been evaluated for the installation of the AERT, Inc., deck boards only. Compatibility of the fasteners to the treated supporting construction has not been evaluated.
4. The AERT, Inc., deck boards indicated in the report must be fastened to the supporting construction as indicated in the manufacturer's installation manual and outlined in this report. When deck board manufacturer's fastening instructions differ from this report, this report governs.
5. When required, the structural deck board layout must be designed by a professional and submitted to the authority having jurisdiction for final acceptance.
7. The AERT, Inc., deck boards have not been evaluated as a member of a fire-resistance-rated assembly.
8. AERT, Inc., has Third Party inspections program provided by PFS Corporation (AA-652).

DOCUMENTATION SUBMITTED:

Submitted data was provided in accordance with PFS TECO 1601 (Quality control manual, Specifications, Manufacturer's installation instructions, Test data and Descriptive information) and tests were done and results evaluated in accordance with "Acceptance Criteria for Deck Board Span Ratings and Guardrail Systems (AC174)."

PRODUCT IDENTIFICATION:

The AERT, Inc., deck boards evaluated in this Research Report must be identified with a label, stamp, or laser imprint on every deck board. The information that is required is as follows: AERT, Inc., product identification, compliance to ASTM D7032 including the maximum deck board span (inches on center spacing of supports) and loading (psf), the Research Report number (RR 0110), and PFS Certification Mark. Deck boards without this information are not covered under this report.

Table 1: Span Table and Fastening Schedule for Deck Boards

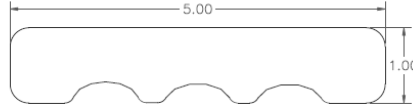
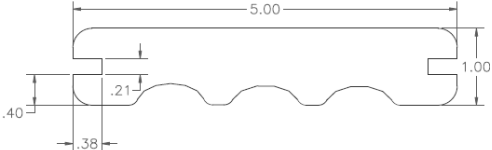
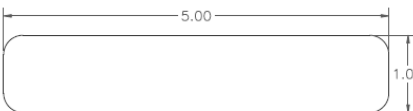
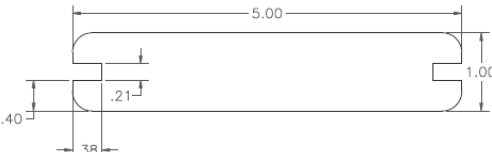
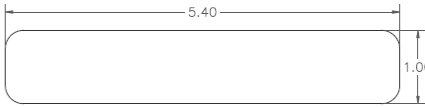
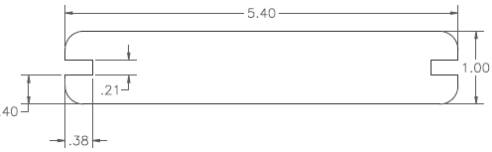
Product Trade Name	Deck Board Profile	Nominal Size	Shape	Maximum Span ¹ Rating (in) for Allowable Load (psf)			Fastening Schedule ² and Uplift Values	Maximum Stair Tread Span (in)
				100	150	200		
MoistureShield®, MoistureShield® Vision, LifeCycle® Premium, MoistureShield® Basics, LifeCycle® Basics		1x5	Oval Fluted	16	12	10	114 lbf per #7x2-1/4" SS Deck Screw	9
MoistureShield®, ModernView™, MoistureShield® Vision, Essential Collection®		1x5	Oval Fluted-Grooved	16	12	10	100 psf with hidden fastening system	9
MoistureShield®, ModernView™, MoistureShield® Vision, Essential Collection®		1x5	Solid	16	12	10	114 lbf per #7x2-1/4" SS Deck Screw	9
		1x5	Grooved	16	12	10	100 psf with hidden fastening system	9
MoistureShield®, Vantage Collection®, Vantage Collection® FR, Lifecycle® Vantage, LifeCycle® MoistureShield® MoistureShield® Vision		1x5-1/2	Solid	16	12	10	114 lbf per #7x2-1/4" SS Deck Screw	9
MoistureShield®, MoistureShield Pro®, MoistureShield® Refine, ChoiceDek™		1x5-1/2	Grooved	16	12	10	100 psf with hidden fastening system	9

Table 1 Continued

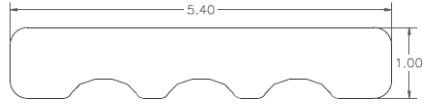
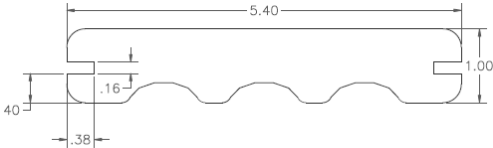
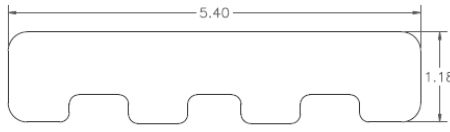
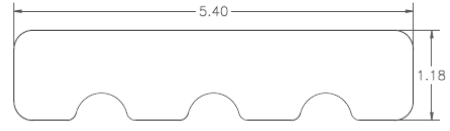
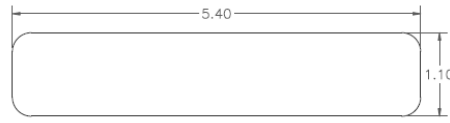
<p>ChoiceDek™, ChoiceDek™ Foundations, ChoiceDek™ Premium</p>		<p>1x5-1/2</p>	<p>Oval Fluted</p>	<p>16</p>	<p>12</p>	<p>10</p>	<p>114 lbf per #7x2-1/4" SS Deck Screw</p>	<p>9</p>
<p>MoistureShield®, MoistureShield® Vision, ChoiceDek™, ChoiceDek™ Foundations, CD Premium, Lifecycle® Basics</p>		<p>1x5-1/2</p>	<p>Oval Fluted – Grooved</p>	<p>16</p>	<p>12</p>	<p>10</p>	<p>100 psf with hidden fastening system</p>	<p>9</p>
<p>MoistureShield®, Lifecycle® Basics</p>		<p>5/4x6</p>	<p>Square Fluted</p>	<p>18</p>	<p>16</p>	<p>12</p>	<p>114 lbf per #7x2-1/4" SS Deck Screw</p>	<p>12</p>
<p>ChoiceDek®</p>		<p>5/4x6</p>	<p>Oval Fluted</p>	<p>18</p>	<p>16</p>	<p>12</p>	<p>114 lbf per #7x2-1/4" SS Deck Screw</p>	<p>12</p>
<p>MoistureShield®, MoistureShield® FR, Elite Collection®, ChoiceDek™ FR</p>		<p>5/4x6</p>	<p>Solid</p>	<p>18</p>	<p>16</p>	<p>12</p>	<p>114 lbf per #7x2-1/4" SS Deck Screw</p>	<p>12</p>

Table 1 Continued

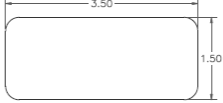
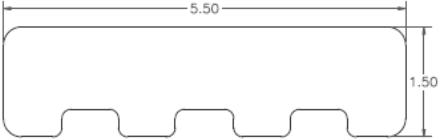
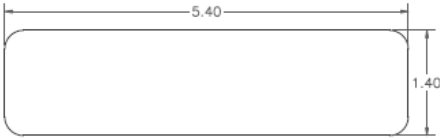
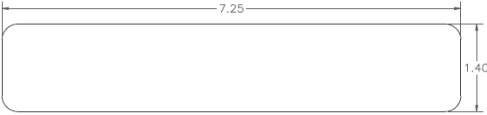
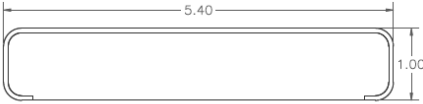
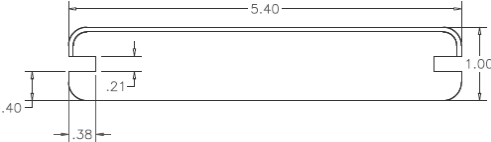
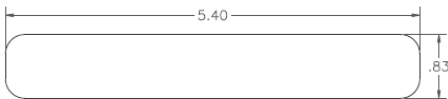
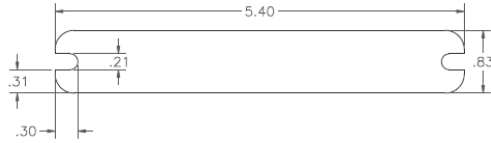
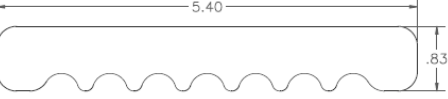
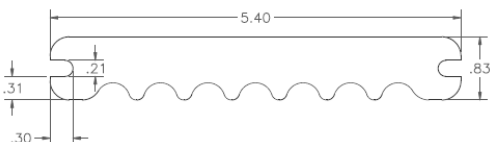
<p>MoistureShield®, ChoiceDek™, ChoiceDek™ Foundations, ChoiceDek™ Premium, MoistureShield® Vision, MoistureShield® Vantage Collection®, MoistureShield® Elite, Lifecycle® Basics</p>		<p>2x4</p>	<p>Solid</p>	<p>20</p>	<p>18</p>	<p>16</p>	<p>114 lbf per #7x2-1/4" SS Deck Screw</p>	<p>14</p>
<p>MoistureShield®, Lifecycle® Basics</p>		<p>2x6</p>	<p>Square Fluted</p>	<p>20</p>	<p>18</p>	<p>16</p>	<p>114 lbf per #7x2-1/4" SS Deck Screw</p>	<p>16</p>
<p>MoistureShield®, Lifecycle® Basics, ChoiceDek™, MoistureShield® Vision, MoistureShield® Vantage Collection®, ChoiceDek™ Premium, ChoiceDek™ FR, MoistureShield® Elite, MoistureShield® FR</p>		<p>2x6</p>	<p>Solid</p>	<p>24</p>	<p>18</p>	<p>16</p>	<p>114 lbf per #7x2-1/4" SS Deck Screw</p>	<p>16</p>
<p>MoistureShield®, ChoiceDek™, ChoiceDek™ Premium, MoistureShield® Vision, MoistureShield® Vantage Collection®, MoistureShield® Elite, Lifecycle® Basics</p>		<p>2x8</p>	<p>Solid</p>	<p>24</p>	<p>18</p>	<p>16</p>	<p>114 lbf per #7x2-1/4" SS Deck Screw</p>	<p>18</p>
<p>MoistureShield®, ChoiceDek™, MoistureShield® Refine, MoistureShield® Infuse, MoistureShield® Pro</p>		<p>1x5-1/2</p>	<p>Solid</p>	<p>16</p>	<p>12</p>	<p>10</p>	<p>114 lbf per #7x2-1/4" SS Deck Screw</p>	<p>9</p>

Table 1 Continued

MoistureShield®, MoistureShield® Vision, Vantage Collection®, MoistureShield® Infuse		1x5-1/2	Grooved	16	12	10	100 psf with hidden fastening system	9
MoistureShield®, ModernView™, MoistureShield® Vision, LifeCycle® by MoistureShield®, LifeCycle® Elite by MoistureShield®		7/8x5-1/2	Solid	16	12	10	114 lbf per #7x2-1/4” SS Deck Screw	8
MoistureShield®, ModernView™, MoistureShield® Vision, LifeCycle® by MoistureShield®, LifeCycle® Elite by MoistureShield®		7/8x5-1/2	Grooved	16	12	10	100 psf with hidden fastening system	8
MoistureShield®, ModernView™, MoistureShield® Vision, LifeCycle® by MoistureShield®, LifeCycle® Euro by MoistureShield®		7/8x5-1/2	Oval Fluted	14	12	10	114 lbf per #7x2-1/4” SS Deck Screw	8
MoistureShield®, ModernView™, MoistureShield® Vision, LifeCycle® by MoistureShield®, LifeCycle® Euro by MoistureShield®		7/8x5-1/2	Oval Fluted – Grooved	14	12	10	100 psf with hidden fastening system	8

for SI conversion: 1 in = 25.4 mm, 1 psi = 47.9 Pa, 1 lbf = 0.0044 kN

¹ Deck boards must be installed perpendicular to supporting construction at the maximum span.

² Deck boards installed with screws must be attached to each joist with 2 #7 x 2-1/4-in. stainless steel deck screws. All fasteners installed with an end/edge distance closer than 1-1/2 in. must be predrilled. Deck boards with side grooves installed with hidden Mantis 320 must be attached to each joist with a fastener according to the Mantis 320 manufacturer’s installation instructions.

The joists to which the deck boards are attached must have a minimum specific gravity of 0.50 or better (Southern Pine) or the fastening must be designed. Deck boards and stair treads must be installed perpendicular to supporting members with a minimum of 2-spans.

No duration of load increase is allowed for the uplift values noted in Table 1 in this report.