DESCRIPTION OF BUILDING COMPONENTS

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

DESCRIPTION OF BUILDING COMPONENTS:

A. Deck Boards

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 (25 x 127 mm) 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 (25 x 137 mm) 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 (28 x 137 mm) 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 (38 x 89 mm) 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 (36 x 137 mm) 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 (36 x 184 mm) 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 (25 x 137 mm) 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 (21 x 137 mm) 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 (25 x 127 mm) 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 (25 x 137 mm) 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 (30 x 137 mm) 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 (30 x 137 mm) 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 (38 x 140 mm) 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 (21 x 137 mm) 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 (25 x 127 mm) 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 (25 x 137 mm) 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 (25 x 137) 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 (21 x 137 mm) 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 (25 x 127 mm) 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 (25 x 137 mm) 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 (21 x 137 mm) 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 4.8 mm between parallel boards for drainage and decking must be installed with a minimum 3.2 mm 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 1334.5 N 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 -29 degrees C (-20 degrees F) to 52 degrees C (+125 degrees F).

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 7032-17 “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 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 section 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.

6. The AERT, Inc. deck boards have not been evaluated as a member of a fire-resistance-rated assembly.

7. AERT, Inc., has a Third-Party inspection program provided by PFS Corporation.
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 the product has been 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 0110M), 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

<table>
<thead>
<tr>
<th>Product Trade Name</th>
<th>Deck Board Profile</th>
<th>Nominal Size</th>
<th>Shape</th>
<th>Maximum Span¹ Rating (mm) for Allowable Load (KPa)</th>
<th>Fastening Schedule² and Uplift Values</th>
<th>Maximum Stair Tread Span (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MoistureShield®, ModernView™, MoistureShield® Vision, Essential Collection®</td>
<td>![Diagram 1]</td>
<td>25x127</td>
<td>Solid</td>
<td>400</td>
<td>300</td>
<td>250</td>
</tr>
<tr>
<td>MoistureShield®, Vantage Collection®, Vantage Collection® FR, Lifecycle®, Vantage, LifeCycle®, MoistureShield®</td>
<td>![Diagram 2]</td>
<td>25x137</td>
<td>Solid</td>
<td>400</td>
<td>300</td>
<td>250</td>
</tr>
<tr>
<td>MoistureShield®, MoistureShield® FR, Elite Collection®, ChoiceDek™ FR</td>
<td>![Diagram 3]</td>
<td>28x137</td>
<td>Solid</td>
<td>450</td>
<td>400</td>
<td>300</td>
</tr>
<tr>
<td>MoistureShield®, ChoiceDek™, ChoiceDek™ Foundations, ChoiceDek™ Premium, MoistureShield® Vision, MoistureShield® Vantage Collection®, MoistureShield® Elite, Lifecycle® Basics</td>
<td>![Diagram 4]</td>
<td>38x89</td>
<td>Solid</td>
<td>500</td>
<td>450</td>
<td>400</td>
</tr>
<tr>
<td>MoistureShield®, Lifecycle® Basics, ChoiceDek™, MoistureShield® Vision, MoistureShield® Vantage Collection®, ChoiceDek™ Premium, ChoiceDek™ FR, MoistureShield® Elite, MoistureShield® FR</td>
<td>![Diagram 5]</td>
<td>36x137</td>
<td>Solid</td>
<td>600</td>
<td>450</td>
<td>400</td>
</tr>
<tr>
<td>MoistureShield®, ChoiceDek™, ChoiceDek™ Premium, MoistureShield® Vision, MoistureShield® Vantage Collection®, MoistureShield® Elite, Lifecycle® Basics</td>
<td>36x184</td>
<td>Solid</td>
<td>600</td>
<td>450</td>
<td>400</td>
<td>507 N per #7x57mm SS Deck Screw</td>
</tr>
<tr>
<td>MoistureShield®, ChoiceDek™, MoistureShield® Refine, MoistureShield® Infuse, MoistureShield® Pro</td>
<td>25x137</td>
<td>Solid</td>
<td>400</td>
<td>300</td>
<td>250</td>
<td>507 N per #7x57mm SS Deck Screw</td>
</tr>
<tr>
<td>MoistureShield®, ModernView™, MoistureShield® Vision, LifeCycle® by MoistureShield®, Lifecycle® by MoistureShield® Elite by MoistureShield®</td>
<td>21x137</td>
<td>Solid</td>
<td>400</td>
<td>300</td>
<td>250</td>
<td>507 N per #7x57mm SS Deck Screw</td>
</tr>
</tbody>
</table>

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

| MoistureShield®, MoistureShield® Vision, LifeCycle® Premium, MoistureShield® Basics, LifeCycle® Basics | 25x127 | Oval Fluted | 400 | 300 | 250 | 507 N per #7x57mm SS Deck Screw | 230 |
| ChoiceDek™, ChoiceDek™ Foundations, ChoiceDek™ Premium | 25x137 | Oval Fluted | 400 | 300 | 250 | 507 N per #7x57mm SS Deck Screw | 230 |
| ChoiceDek® | 30x137 | Oval Fluted | 450 | 400 | 300 | 507 N per #7x57mm SS Deck Screw | 300 |
### Table 1 Continued

<table>
<thead>
<tr>
<th>Material Description</th>
<th>Dimensions</th>
<th>Fastening System</th>
<th>Minimum N per Screw</th>
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</thead>
<tbody>
<tr>
<td>MoistureShield®, Lifecycle® Basics</td>
<td>30x137</td>
<td>Square Fluted</td>
<td>450 400 300</td>
</tr>
<tr>
<td>MoistureShield®, Lifecycle® Basics</td>
<td>38x140</td>
<td>Square Fluted</td>
<td>500 450 400</td>
</tr>
<tr>
<td>MoistureShield®, Lifecycle®, ModernView®, MoistureShield® Vision, LifeCycle®</td>
<td>21x137</td>
<td>Oval Fluted</td>
<td>350 300 250</td>
</tr>
<tr>
<td>A.3. Deck Boards: Solid with Side Grooves</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MoistureShield®, ModernView®, MoistureShield® Vision, Essential Collection®</td>
<td>25x127</td>
<td>Grooved</td>
<td>400 300 250</td>
</tr>
<tr>
<td>MoistureShield®, MoistureShield® Vision, Vantage Collection®, MoistureShield® Infuse</td>
<td>25x137</td>
<td>Grooved</td>
<td>400 300 250</td>
</tr>
<tr>
<td>MoistureShield®, MoistureShield® Pro®, MoistureShield® Refine, ChoiceDek™</td>
<td>25x137</td>
<td>Grooved</td>
<td>400 300 250</td>
</tr>
</tbody>
</table>
Table 1 Continued

<table>
<thead>
<tr>
<th>MoistureShield®, ModernView™, MoistureShield® Vision, LifeCycle® by MoistureShield®, LifeCycle® Elite by MoistureShield®</th>
<th>21x137</th>
<th>Grooved</th>
<th>400</th>
<th>300</th>
<th>250</th>
<th>4.79 kPa with hidden fastening system</th>
<th>200</th>
</tr>
</thead>
</table>

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

<table>
<thead>
<tr>
<th>MoistureShield®, ModernView™, MoistureShield® Vision, Essential Collection®</th>
<th>25x127</th>
<th>Oval Fluted-Grooved</th>
<th>400</th>
<th>300</th>
<th>250</th>
<th>4.79 kPa with hidden fastening system</th>
<th>230</th>
</tr>
</thead>
<tbody>
<tr>
<td>MoistureShield®, MoistureShield® Vision, ChoiceDek™, ChoiceDek™ Foundations, CD Premium, LifeCycle® Basics</td>
<td>25x137</td>
<td>Oval Fluted-Grooved</td>
<td>400</td>
<td>300</td>
<td>250</td>
<td>4.79 kPa with hidden fastening system</td>
<td>230</td>
</tr>
<tr>
<td>MoistureShield®, ModernView™, MoistureShield® Vision, LifeCycle® by MoistureShield®, LifeCycle® Euro by MoistureShield®</td>
<td>21x137</td>
<td>Oval Fluted-Grooved</td>
<td>350</td>
<td>300</td>
<td>250</td>
<td>4.79 kPa with hidden fastening system</td>
<td>200</td>
</tr>
</tbody>
</table>

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 57 mm stainless steel deck screws. All fasteners installed with an end/edge distance closer than 38 mm 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.