

Code Compliant Vinyl Deck and Guardrail Systems

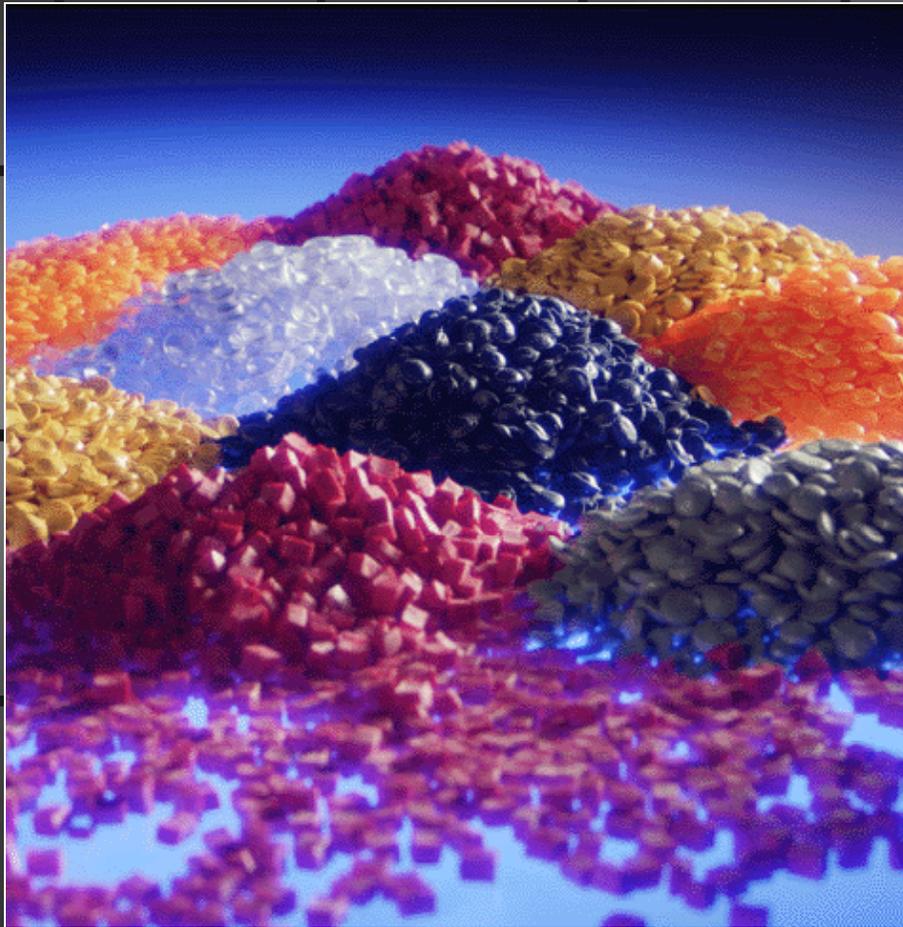
What to Look for and Where...

Presented by: VFDRMA

Understanding Vinyl

- What About Vinyl?
- What Is It and Where Does It Come From?
- How Is It Formed/Shaped?

What About Vinyl?



- Largest Volume Plastic in Building and Construction
- 2/3 of Vinyl Manufactured for Building and Construction Applications
- Versatility- Flexible, Rigid and Customized Applications. Can be Made in Colors, Patterns or Textures.
- Combines Many Characteristics of Traditional Materials with Advanced Technologies

What is it and Where Does it Come From?



+



Building blocks are derived from salt and petroleum



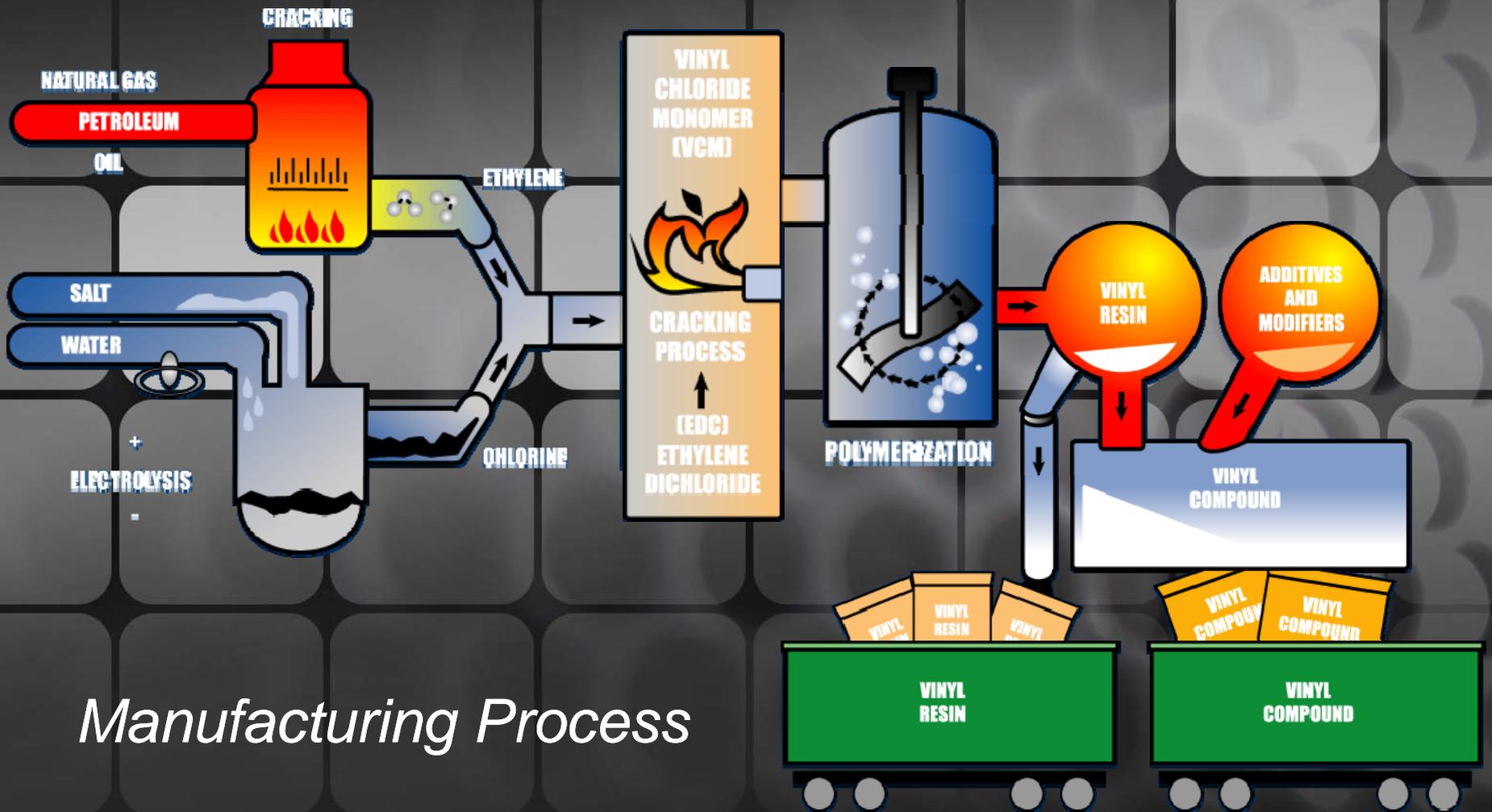
Vinyl Chloride monomer gas polymerizes to powder resin in a clean, controlled and automated process.



High-tech compounding and unique processing techniques yield vinyl's versatility



Raw Material to Resin and Compound



Manufacturing Process

How Is It Formed/Shaped?

Specially Formulated Vinyl Compound

Advanced Technology Monitors the Process to Assure Quality Control

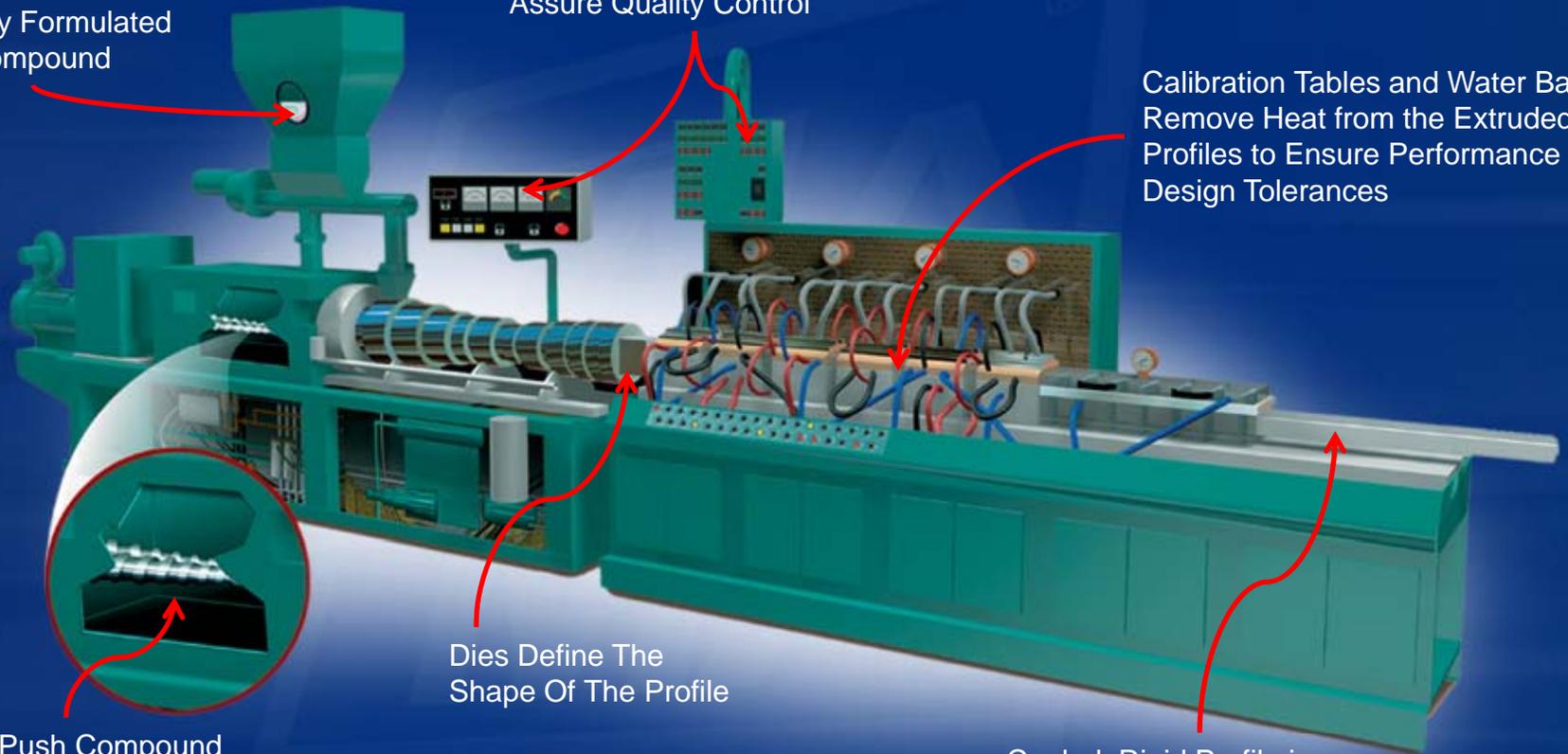
Calibration Tables and Water Baths Remove Heat from the Extruded Profiles to Ensure Performance and Design Tolerances



Screws Push Compound Through Extruder and Die

Dies Define The Shape Of The Profile

Cooled, Rigid Profile is Pulled from the Water Bath and Cut to Useable Lengths



Vinyl vs. WPC

Vinyl

- Essentially 100% Plastic
- Hollow Profiles
- Often reinforced for strength in railings
- Virtually impervious to moisture and decay
- Limited, but expanding color options
- Specialized tools or installation methods (decking)

WPC (Wood Plastic Composite)

- Mixture of Natural Fiber (commonly wood) and Plastic
- May be solid or hollow profiles
- More inherent structural strength in material
- Natural fibers absorb moisture and are subject to decay
- Large color selection
- Works similar to wood

Vinyl vs. WPC

- Both materials are
 - good with unique benefits for the installer and homeowner
 - suitable for the Fence, Deck and Railing product categories
 - better, long-term alternatives to wood
 - tested using the same criteria (AC174). *Vinyl does have a few exclusions- decay, termite, etc. because of the lack of natural fibers in PVC*

Understanding Product Requirements

- Material Testing
 - UV Resistance - >10% change affects adjustment factors
 - Freeze-Thaw Resistance- >10% change affects adjustment factors
 - Temperature Effects- >25% change affects adjustment factors
 - Moisture Effects- >25% change affects adjustment factors
 - Flexural Strength of Finished Product

Understanding Product Requirements

- Decking

- Span Rating- $L/180$ deflection limit
 - Stair Treads- 1/8" deflection limit
 - Duration of Load (90 days)- generally 100 psf x 2 FOS May vary depending on products.
 - Fasteners- Varies by product
 - Slip Resistance- not code required, but is covered under the ADA.
 - Non-accessible- .5 Slip Resistance
 - Accessible- .6 Slip Resistance
 - Ramps- .8 Slip Resistance
- *Note that different tests will give different results...

Understanding Product Requirements

- Guardrails

- Uniform Horizontal Load on Top Rail- 50 lb/lf (125 lb/lf test) IBC only
- Uniform Vertical Load on Top Rail- 50 lb/lf (125 lb/lf test) IBC only
- Concentrated Horizontal Load on Top Rail- 200 lb (500 lb test at midpoint) deflection limit ($h/24 + l/96$)
- Concentrated Horizontal Load on Top Rail Connections (500 lb test at rail to post connection up to 8' span. 625 lb load for 10' spans.)
- In-Fill- 50 lb/sq ft (125 lb test)
- Assembly Fastener (corner connections)

Understanding Product Requirements

- Handrail
 - Concentrated Horizontal Load on Top Rail-
200 lb (500 lb test at midpoint)
 - Mounting Connection Load-
 - 200 lbs as designed OR
 - 500 lbs tested at any point and in any direction on the handrail

Researching Compliance of Specific Products

- VFDRMA website- www.vfdrma.com
 - <http://www.americanfenceassociation.com/Members/VFDRMA/VFDRMACodeReports/tabid/371/Default.aspx>
- ICC-ES website- www.icc-es.org
- ATI website- www.archtest.com

Stages of Protection

- Permitting
- Inspection

Stages of Protection

- Permitting
 - First line of protection-
- Inspection
 - Last line of protection
 - Depending on the jurisdiction, the level and number of inspections vary.
 - Inspecting projects only at the completed stage can make understanding the connections very difficult.
 - Hidden fasteners
 - Under deck water drainage systems
 - Trim boards and fascia
 - Post caps and skirts

Permitting

- Project Submittal
 - Type of Project
 - One-and-Two Family (IRC)
 - Multi-Family or Commercial (IBC)
 - Type of Product
 - Decking
 - Guardrail
 - Handrail
 - Product Documentation

Types of Product Documentation

- None
- Non-Reviewed Test Results
- Sealed Drawings
- Sealed Independent Test Reports
- Evaluation Reports

Types of Product Documentation

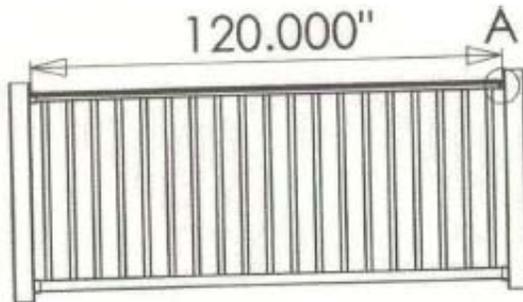
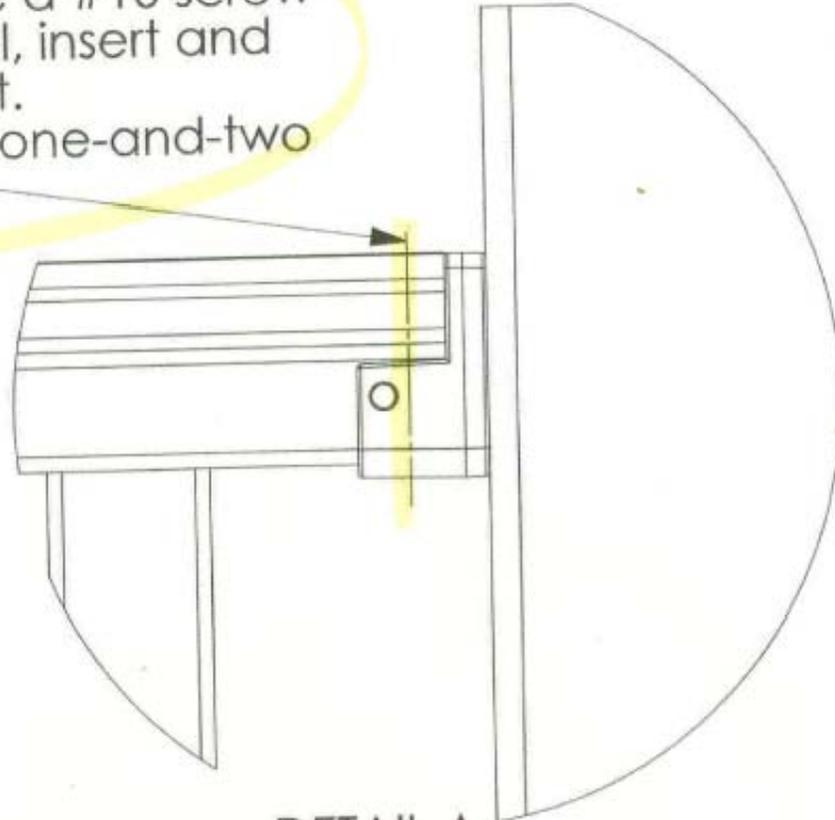
- None
 - Dangerous. Ask for them to get some information so you can make a proper judgment.
- Non-Reviewed Test Results
 - Risky. Talk with the applicant to see what they know about the tests and how they were designed and conducted.
 - Some may be great data points, others not so much.

Types of Product Documentation

- Sealed Drawings

- Acceptable? Make sure that the drawings cover the load requirements of the applicable code AND safety factors of 2.5 or more.
- Make sure that connection details and item descriptions are good enough to prevent “Bait and Switch”.
- Manufacturer’s information should be available on the drawings. Talk with the manufacturer to get clarification if necessary.

>96" spans require a #10 screw driven through rail, insert and mounting bracket. (limited for use in one-and-two family dwellings.)



DETAIL A
SCALE 1 : 1.25

PROPRIETARY AND CONFIDENTIAL
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2D ISOMETRIC DRAWING
DIMENSIONS ARE UNLESS OTHERWISE SPECIFIED:
FRACTIONS: 1/8", 1/4", 3/8", 1/2"
ANGULAR: MAXIMUM 1/8" PER 12"
TWO PLACE DECIMAL 1/32"
THREE PLACE DECIMAL 1/64"



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PROJECT		PROJECT	

Types of Product Documentation

- Sealed Independent Test Reports
 - Good. Testing done by an independent test lab helps with validation.
 - Make sure that the report covers the load requirements of the applicable code AND safety factors of 2.5 or more.
 - Make sure that connection details and item descriptions are good enough to prevent “Bait and Switch”.

Types of Product Documentation

- Evaluation Reports
 - Best. Evaluation Reports are generally only issued after appropriate testing and professional review has been completed.
 - Labeling of product/product packaging makes verification easy.
 - Provides a sense of security that labeled product is compliant. QC systems in place to ensure that systems are manufactured properly.
 - Watch for unknown agencies issuing reports.
 - Question their expertise.
 - Question the source of their testing requirements.
 - Question their review process.

Types of Product Documentation

- Evaluation Reports
 - Understand the installation requirements and conditions of use
 - Just because a product has a report for a particular code does not mean its automatically “OK”.

Permitting

- Check for Performance Documentation
 - Plans
 - Engineering
 - Testing
 - Evaluation
- Decking
 - Maximum Span
 - Review the documentation to ensure that the product will be installed on a properly designed sub-structure for the product that is being used.
 - Understand that stair treads often require more support than deck boards.
 - Conditions of Use
 - Limitations for Location or Occupancy Type
 - Limitations for Specific Application or Installation Condition

3.3.1.1 Rectangular Rail: The rectangular rail is manufactured with dimensions of 2 by 3 1/2 inches (51 by 89 mm) and a wall thickness of 0.095 inch (2.4 mm). The rail, when used as a top rail, is designed to be installed with a P-channel insert fabricated from 6063-T6 aluminum alloy.

3.3.1.2 T-Rail: The T-Rail is a Tee-shaped component with a width of 3 1/2 inches (89 mm), a depth of 3 1/2 inches (89 mm) and a wall thickness of 0.090 inch (2.3 mm). The T-Rail is designed to be installed with a P-channel insert fabricated from 6063-T6 aluminum alloy.

3.3.1.3 R-Rail: The R-Rail is a bread loaf-shaped component with a width of 3 inches (76 mm), a depth of 3 1/2 inches (89 mm) and a wall thickness of 0.125 inch (3.2 mm). The R-Rail is designed to be installed with a 2.7-by-0.80-inch (69 by 20.3 mm) 6063-T6 aluminum alloy insert.

3.3.1.4 Baluster: The balusters are fabricated in three distinct sizes: 1 1/4 by 1 1/4 inches (32 by 32 mm) with a wall thickness of 0.07 inch (1.8 mm); 1 1/8 by 1 1/8 inches (35 by 35 mm) with a wall thickness of 0.07 inch (1.8 mm); and 1 1/2 by 1 1/2 inches (38 by 38 mm) with a wall thickness of 0.07 inch (1.8 mm).

3.3.2 Durability: When subjected to weathering, insect attack, and other decaying elements, material used to manufacture Rectangular, T-Rail and R-Rail systems are equivalent in durability to preservative-treated or naturally durable lumber when used in locations described in Section 2.0. Gorilla Deck® has been evaluated for structural performance when exposed to a temperature range from -20°F to 125°F (-29°C to 52°C).

3.3.3 Surface-burning Characteristics: When tested in accordance with ASTM E 84, Rectangular, T-Rail and R-Rail systems have a flame-spread index of no greater than 200.

4.0 DESIGN AND INSTALLATION

4.1 General:

Installation of the Gorilla Deck®, Rectangular, T-Rail and R-Rail systems must comply with this report and the manufacturer's published installation instructions. The manufacturer's published installation instructions shall be available at the jobsite at all times during installation.

4.2 Deck Boards:

4.2.1 General: When installing the first board of the Gorilla Deck®, a starter strip shall be installed utilizing a No. 8 by 1 1/2-inch (64 mm) stainless steel pan head screw at each support. The first board is snapped into the starter strip and fastened in the same manner as the starter strip. Each subsequent board is installed by snapping into the previous board and fastening in the same manner. Fasteners shall be installed a minimum of 1/4 inch (19 mm) from the end of each board. Butt joints shall be supported with a double joist allowing a gap as recommended by the manufacturer's published installation instructions. The deck boards shall not extend past the last support.

4.2.2 Structural: The Gorilla Deck®, when used as a deck board, will have an allowable capacity, when installed at a maximum center-to-center spacing of the supporting construction, as prescribed in Table 1.

4.3 Guardrail:

4.3.1 General: The Rectangular, T-Rail and R-Rail systems are assembled using a bracketed component

assembly. The balusters are installed by insertion into a routed opening. The routed openings are fabricated so that a maximum opening of 3.9 inches (99 mm) between balusters is maintained. One 1 1/2-by-1 1/2-inch-square footblock is installed at the midpoint of the bottom rail. The bottom rail is installed without any additional reinforcement.

4.3.2 Bracketed Component Assembly: The brackets used to attach the top and bottom rails to structures must be attached to the structure using four No.10 by 2 inch (51 mm) stainless steel wood screws. The top rail is attached to the bracket by using two No. 10 by 1 inch (25.4 mm) stainless steel pan head screws which anchor to the top rail reinforcement insert. The top rail components must be reinforced as described in Sections 3.3.1.1, 3.3.1.2 and 3.3.1.3, respectively.

4.3.3 Structural: The Rectangular, T-Rail and R-Rail systems will resist the loads specified in the applicable code when installed at a maximum length as specified in Table 2.

5.0 CONDITIONS OF USE

The Gorilla Deck® and Rectangular, T-Rail and R-Rail systems described in this report comply with the applicable code alternatives to what is specified in Section 1.0 of this report, subject to the following conditions:

- 5.1 The Gorilla Deck® described in this report is limited to exterior use as a deck board for balconies, porches, and decks of Type V-B construction (IBC) and structures constructed in accordance with the IRC.
- 5.2 The Rectangular, T-Rail and R-Rail systems described in this report are limited to exterior use as guards for balconies, porches, and decks of Type V-B construction (IBC) and structures constructed in accordance with the IRC.
- 5.3 Installation must comply with the manufacturer's published installation instructions and the applicable code. Only those fastener configurations described in this report have been evaluated for the installation of the Gorilla Deck®, Rectangular, T-Rail and R-Rail systems. When the manufacturer's published installation instructions differ from this report, this report governs.
- 5.4 The use of the Gorilla Deck® as a component of a fire-resistance-rated assembly is outside the scope of this report.
- 5.5 The Gorilla Deck® has been evaluated for installation across a minimum of three supports (two-span condition). If installed in a single span condition, the maximum allowable uniform load specified in Table 1 must be reduced 5 percent.
- 5.6 The use of wood posts, with or without a post cap, is outside the scope of this report.
- 5.7 The compatibility of the fasteners with the supporting construction, including chemically treated wood, is outside the scope of this report.
- 5.8 Adjustment factors outlined in the *Design Specification* and applicable to the allowable capacity and moment for the Gorilla Deck® and Rectangular, T-Rail and R-Rail systems.
- 5.9 The use of the Gorilla Deck® as a component of a fire-resistance-rated assembly is outside the scope of this report.

5.0 CONDITIONS OF USE

The Gorilla Deck® and Rectangular, T-Rail and R-Rail systems described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 The Gorilla Deck® described in this report is limited to exterior use as a deck board for balconies, porches and decks of Type V-B construction (IBC) and structures constructed in accordance with the IRC.
- 5.2 The Rectangular, T-Rail and R-Rail systems described in this report are limited to exterior use as guards for balconies, porches, and decks of Type V-B construction (IBC) and structures constructed in accordance with the IRC.
- 5.3 Installation must comply with this report, the manufacturer's published installation instructions and the applicable code. Only those fasteners and fastener configurations described in this report have been evaluated for the installation of the Gorilla Deck® and Rectangular, T-Rail and R-Rail systems. When the manufacturer's published installation instructions differ from this report, this report governs.
- 5.4 The use of the Gorilla Deck® as a component of a fire-resistance-rated assembly is outside the scope of this report.
- 5.5 The Gorilla Deck® has been evaluated for installation across a minimum of three supports (two-span condition). If installed in a single span condition, the maximum allowable uniform load specified in Table 1 must be reduced 5 percent.

4.2.4 Fasteners: The AZEK deck boards must be fastened with two No. 7 by 2 1/4-inch-long (57.2 mm) stainless steel screws at each supporting wood member having a minimum specific gravity of 0.50. The minimum edge and end distance for fasteners is 1/4 inch (6.3 mm) to 1/2 inch (12.7 mm) from any end of deck board.

5.0 CONDITIONS OF USE

The AZEK deck boards described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 This product is limited to exterior use as deck boards for balconies, porches, decks, stair treads and similar appendages of buildings of Type V-B (IBC) construction and buildings constructed in accordance with the IRC.
- 5.2 Installation must comply with this report, the manufacturer's published instructions and the applicable code. Only those fasteners and fastener configurations described in this report have been evaluated for the installation of the AZEK deck boards.
- 5.3 The use of the deck boards as components of a fire-resistance-rated assembly is outside the scope of this report.
- 5.4 The compatibility of the fasteners with the supporting construction, including chemically treated wood, is outside the scope of this report.
- 5.5 Deck boards must be directly fastened to supporting construction. Where required by the code official, engineering calculations and construction documents consistent with this report must be submitted for

approval. The calculations must verify that the supporting construction complies with the applicable building code requirements and is adequate to resist the loads imparted upon it from the products and systems described in this report. The documents must contain details of the attachment to the supporting structure consistent with the requirements of this report. The documents must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

5.6 Adjustment factors outlined in the AF&PA National Design Standard apply to the design of the AZEK Decking System.

5.7 The AZEK Decking System is approved for use in Alabama, and other jurisdictions where the quality control program meets the requirements of the International Building Code (IBC) and the International Residential Code (IRC).

6.0 EVIDENCE SUBMITTED

Data in accordance with the International Building Code (IBC) and International Residential Code (IRC) Guardrail Systems, February 2008 (edition 2008).

7.0 IDENTIFICATION

The deck boards are labeled with the AZEK Decking System name and number (ESR-1667).

TABLE 1—DECK BOARD SPAN RATINGS

PRODUCT NAME	MAXIMUM SPAN ¹ (inches)
5/8-inch-by-6 inch deck board	16
7/8-inch-by-3 1/2-inch deck board	16
5/8-inch-by-3 1/2-inch tongue-and-groove porch board	16

For SI: 1 inch = 25.4 mm; 1 lbf/ft² = 47.9 Pa.

¹Maximum span is measured center-to-center of the supporting construction.
²Maximum allowable capacity is adjusted for durability. No further increases are permitted.

TABLE 2—MAXIMUM STAIR TREAD SPANS¹

DECK BOARDS USED AS STAIR TREADS	MAXIMUM SPAN (inches)
5/8-inch-by-6 inch deck board ²	17.25
7/8-inch-by-6 inch deck board ³	9
5/8-inch-by-6 inch deck board ⁴	24
5/8-inch-by-3 1/2-inch tongue-and-groove porch board ⁵	11

For SI: 1 inch = 25.4 mm; 1 lbf/ft² = 47.9 Pa.

¹Based on a minimum 2-span installation.
²Maximum span is measured center-to-center of the supporting construction. A treated Southern pine 2-by-6 installed flatwise between the stringers and directly beneath the deck board using Simpson A23 connectors attached with hot galvanized 10d by 1 1/2-inch joist hanger nails.
³Maximum span measured center-to-center of the supporting construction with no additional support.
⁴Maximum span measured center-to-center of the supporting construction with a treated 2-by-4 support under each tread attached with two 0.131-inch-diameter-by-3 1/4-inch-long round drive framing nails.
⁵Maximum span measured center-to-center of the supporting construction with no additional support.

TABLE 1—DECK BOARD SPAN RATINGS

PRODUCT NAME	MAXIMUM SPAN ¹ (inches)	ALLOWABLE CAPACITY ² (lb/ft ²)
5/8-inch-by-6 inch deck board	16	100
5/8-inch-by-3 1/2-inch deck board	16	100
5/8-inch-by-3 1/2-inch tongue-and-groove porch board	16	100

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⁵Maximum span measured center-to-center of the supporting construction with no additional support.

Permitting

- **Guardrails**
 - Maximum Rail Height
 - Maximum Section Span
 - Rail to Post/Supporting Structure Attachment
 - Conditions of Use
 - Limitations for Location or Occupancy Type
 - Limitations for Specific Application or Installation Condition
- **Handrail**
 - Maximum Span
 - Rail to Post/Supporting Structure Attachment

The top rail-to-post connector bracket is secured with two No. 10 by 2-inch (51 mm) stainless steel wood screws for connections to solid sawn lumber with a minimum specific gravity of 0.42. The bottom rail-to-post connector bracket is secured with four No. 10 by 2-inch (51 mm) stainless steel wood screws. The balusters are installed by inserting each one into prerouted holes in both the top and bottom rails. There are two balusters in each assembly that have crimped ends. These two balusters are to be spaced evenly within the assembly. Vertical supports (posts) for the Endurance® Railing System are outside the scope of this report and must be designed to resist horizontal and vertical loads on the guard as specified in the applicable code. See Figure 1 for top rail assembly detail.

5.0 CONDITIONS OF USE

The Endurance® Railing System described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 This product is limited to exterior use as a guardrail system for balconies, porches and decks in buildings of Type V-B (IBC) construction and other types of construction in applications where untreated wood is permitted by IBC Section 1406.3, or in buildings constructed in accordance with the IRC.

4.0 DESIGN AND INSTALLATION

4.1 General:

The Endurance® Railing System must be installed in accordance with the manufacturer's published installation instructions, the approved construction documents and this

- 5.5 The use of wood posts, with or without post sleeves, is outside the scope of this report.

- 5.6 The use of a corner rail connection that is connected to a rail post is outside the scope of this report.

- 5.7 The Endurance® Railing System is produced in Millville, New Jersey, under a quality control program with inspections by PFS Corporation. (AA-652).

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Deck Board Span Ratings and Guardrail Systems (Guards and Handrails) (AC174), dated February 2008 (editorially revised April 2008).

7.0 IDENTIFICATION

The Endurance® Railing System described in this report is identified by a stamp, on each individual piece or on the packaging, bearing the manufacturer's name (Railing Dynamics, Inc.), the product name (Endurance® Railing System), the name of the inspection agency (PFS), and the ICC-ES evaluation report number (ESR-1849).

subject to the following conditions:

- 5.1 This product is limited to exterior use as a guardrail system for balconies, porches and decks in buildings of Type V-B (IBC) construction and other types of construction in applications where untreated wood is permitted by IBC Section 1406.3, or in buildings constructed in accordance with the IRC.

- 5.2 Installation must comply with this report, the manufacturer's published installation instructions and the applicable code. When the manufacturer's published installation instructions differ from this report, this report governs.

- 3 Only those fasteners and fastener configurations described in this report have been evaluated for the installation of the Endurance® Railing System. The compatibility of the fasteners with the supporting construction, including chemically treated wood, is outside the scope of this report.

- 4 The Endurance® Railing System must be directly fastened to supporting construction having adequate strength and stiffness. Where required by the code official, engineering calculations and construction documents consistent with this report must be submitted for approval. The calculations must verify that the supporting construction complies with the applicable building code requirements and is adequate to resist the loads imparted upon it from the products and systems discussed in this report. The documents must contain details of the attachment to the supporting structure consistent with the requirements of this report. The documents must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

- 5 The use of wood posts, with or without post sleeves, is outside the scope of this report.

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9.0 Code Compliance Research Report Use

9.1. Approval of building products and/or materials can only be granted by a building official having legal authority in the specific

9.3. Reference to the Architectural Testing internet web site address at www.archtest.com is recommended to ascertain the current version and status of this report.

Table 1 –Railing System Descriptions and Code Recognition

Enrail™ Railing Systems	Railing System Components (See Table 2 for available balusters)	Maximum Size (Length x Height) ¹
100 Series	Top: 2"x3-1/2" Rail with Alum "H" channel Btm: 2"x3-1/2" Rail with Alum "H" channel ² Top & Btm. Brackets: Eclipse Zinc or Eclipse PVC	8' x 42" / IBC & IRC 8' x 36" / IRC only
	Top: 2"x3-1/2" Rail with Alum "H" channel Btm: 2"x3-1/2" Rail with Alum "H" channel ² Top & Btm. Brackets: Eclipse Zinc	10' x 42" or 10' x 36" / IRC One- and Two- Family Dwellings only
200 Series	Top: T-Rail with Alum "H" channel Btm: 2"x3-1/2" Rail with Alum "H" channel ² Top & Btm. Brackets: Eclipse Zinc or Eclipse PVC	10' x 42" / IBC & IRC 10' x 36" / IRC only
300 Series	Top: Small Contour Rail with Contour Alum insert Btm: 2"x3-1/2" Rail with Alum "H" channel Top Brackets: Small Contour (Polycarbonate) Bracket	8' x 42" / IBC & IRC 8' x 36" / IRC only
	Btm. Brackets: Eclipse Zinc or Eclipse PVC or Enduris PVC Bracket (END1092)	

¹ Railing lengths are clear length between supports. Railing height is installed height from walking surface to top of top rail. Bottom rail clearance is 2-1/2"

² Aluminum "H" Channel is optional in bottom rail for railing lengths 8 feet and less. When utilized, intermediate support blocks are not required for installations not exceeding 8 feet in One- And Two-Family Dwellings (IRC). See Paragraph 3.3.3

Code Recognition

	Maximum Size (Length x Height) ¹
PVC	8' x 42" / IBC & IRC 8' x 36" / IRC only
PVC	10' x 42" or 10' x 36" / IRC One- and Two- Family Dwellings only
PVC	10' x 42" / IBC & IRC 10' x 36" / IRC only
Insert) Bracket or	8' x 42" / IBC & IRC 8' x 36" / IRC only

ght is installed height from walking

gths 8 feet and less.
ninstallations not exceeding 8 feet in

7.1. Conventional wood supports for guards are not within the scope of this report and are subject to evaluation and approval by the building official. Supports must satisfy the design load requirements specified in Chapter 16 of the IBC and must provide suitable material for anchorage of the rail brackets. Where required by the building official, engineering calculations and details shall be provided.

7.2. Anchorage of the Steel Post Mount assemblies are not within the scope of this report and are subject to evaluation and approval by the building official. Anchors must satisfy the design load requirements specified in Chapter 16 of the building code and must meet the following minimum requirements:

7.2.1. A minimum of four anchor bolts must be used and located in the four pre-drilled holes in the post base plate.

7.2.2. The anchors must have a minimum nominal diameter equal to 0.375 inch.

7.2.3. When the supporting structure is a wood-framed deck, installation must include anchorage to suitable structural framing. Decking is not considered structural framing and anchorage to decking alone is not an approved installation method.

7.2.4. Where required by the building official, engineering calculations and details shall be provided. The calculations shall verify that the anchorage complies with the building code for the type and condition of the supporting construction.

7.3. Compatibility of fasteners and other metallic components with the supporting structure, including the supporting structure, is not within the scope of this report.

7.4. *Illusions*™ are manufactured by Illusions Manufacturing Co., Inc in Calverton, NY. The report is in accordance with the system and inspection requirements of Illusions Manufacturing Co., Inc (AA-676).

8.0 Identification

The guard assembly is a Wholesale Fence Co. product. The report shall be an individual component. The name of the Wholesale Fence Co. product, the identifying mark, the agency, and the report number (CCRR-0143) and mark.

9.0 Code Compliance

9.1. Approval of materials can only be given by an official having jurisdiction where the materials are used.

9.2. Code Compliance is not to be used in lieu of an endorsement of Testing, Inc.

9.3. Reference to an internet web site is recommended and status of this site should be verified.

7.2. Anchorage of the Steel Post Mount assemblies are not within the scope of this report and are subject to evaluation and approval by the building official. Anchors must satisfy the design load requirements specified in Chapter 16 of the building code and must meet the following minimum requirements:

7.2.1. A minimum of four anchor bolts must be used and located in the four pre-drilled holes in the post base plate.

7.2.2. The anchors must have a minimum nominal diameter equal to 0.375 inch.

7.2.3. When the supporting structure is a wood-framed deck, installation must include anchorage to suitable structural framing. Decking is not considered structural framing and anchorage to decking alone is not an approved installation method.

7.2.4. Where required by the building official, engineering calculations and details shall be provided. The calculations shall verify that the anchorage complies with the building code for the type and condition of the supporting construction.

Inspection

- Verify Products to Permit
 - Often, the product applied for on the permit is NOT what is installed. Sometimes this is because the product being used has not been properly tested and/or reviewed and the contractor would not be able to get a permit.
 - Check product on-site prior to installation if possible. Products covered in a research report should be labeled on the product or the packaging with information linking the product to the research report. Ask for documentation showing the research report number and QC agency.

Inspection

- Check the general stability of the installed product.
- Review the installation instructions
 - Have the installer provide the installation instructions for the products.
 - Manufacturers usually stress the importance of proper installation on the instruction sheets.
 - Instruction sheets will help the you understand how the product should have been assembled and may clue you in to problems.

Inspection

- Check the support spans
 - Decking, is typically on 12", 16" or 24" joist spacing. See the approval documentation for details.
 - Railing (guards and handrails) usually have a maximum span of 6', 8' or 10'. Anything over 10' is not allowed according to AC174. Any sections installed shorter than the maximum size in the approval documentation are generally accepted. See the approval documentation for details.

Inspection

- Check the fasteners
 - Verify that the fasteners are the size and length that is specified in the test or research report.
 - Make sure that the fasteners are corrosion resistant and suitable for use with CCA lumber if applicable. Stainless steel fasteners are generally preferable for corrosion resistance.
 - Check to be certain that all required fasteners have been installed. In vinyl systems, all fasteners are often hidden. Have the installer remove the covers or a portion of one or more products to verify that all connections are properly made.

Product Compliance- Decking

- AC-174- Acceptance Criteria for Deck Board Span Ratings and Guardrail Systems (Guards and Handrails)
http://www.icc-es.org/criteria/pdf_files/ac174.pdf
- ASTM D7032 Establishing Performance Ratings for Wood-Plastic Composite Deck Boards and Guardrail Systems) Guards or Handrails