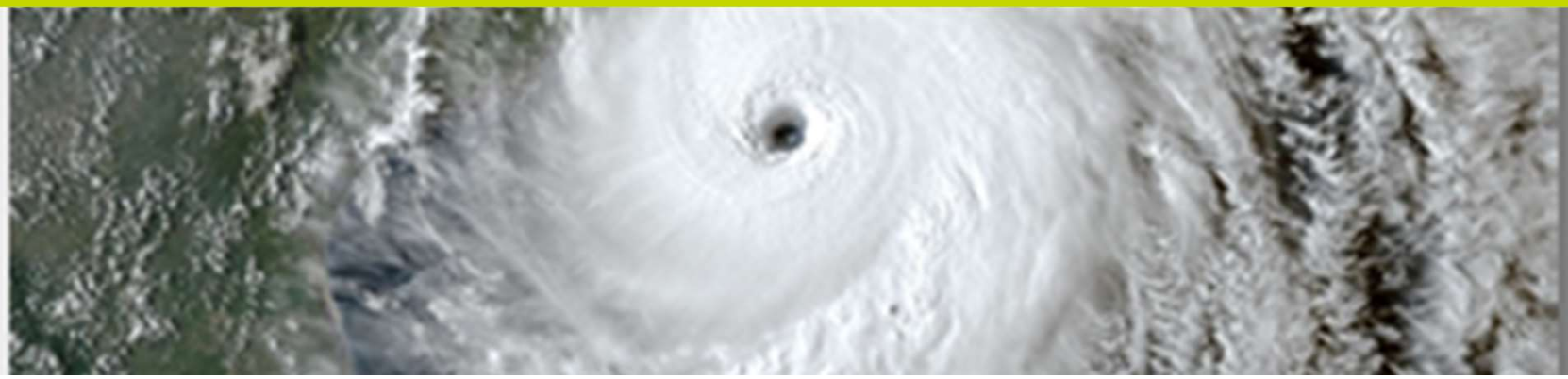
INDUSTRY UPDATE

Polymeric Cladding and Wind Performance 2020

VINYL SIDING INSTITUTE™

Data, Observations and Recommendations Moving Forward



UPDATE OUTLINE

- Vinyl Siding Institute Background and Action
- Research Experience, New Analysis Protocol
- 2020 Research
  - Hurricane Isaias Report
  - Hurricane Laura Report
  - ASTM D5206 Research on Installation

BACKGROUND

The Vinyl Siding Institute, Inc. (VSI) is the trade association for manufacturers of vinyl and other polymeric siding and suppliers to the industry.

- Founded in 1978
- Addresses regulatory issues, including material restrictions, monitoring of building codes, and the education of building code developers and regulators
- Helps develop material, product and performance standards and requirements by working through standards-making organizations and code bodies
- Work with researchers and other building material scientists to assist with stronger understanding of products
- Sponsors certification programs that improve the quality of siding and its installation
- Provides a forum for issues of interest to the vinyl siding industry
- Engages in product stewardship and outreach activities to enhance the image of the industry and its products

RECENT STEPS TAKEN BY VSI AND INDUSTRY

- Addition of wind design pressure rating publication and labeling of product boxes to identify appropriate product for coastal areas
- Added stronger provisions in codes for soffit and fascia installation (I-codes and Florida)
- Working with FEMA, builders, IBHS and universities on these issues

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VSI EXPERIENCE WITH HURRICANE RESEARCH

Over the past 15 years, VSI has conducted field analysis research in the aftermath of hurricanes. This research has resulted in confirmation of positive performance of polymeric claddings as well as minor areas of failure mainly attributed to improper installation practices.

Hurricane analyses have included:

- Hurricane Katrina (2005)
- Hurricane Ike (2008)
- Hurricane Irma (2017)
- Hurricane Florence (2018)
- Hurricane Michael (2018)
- Hurricane Isaias (2020)
- Hurricane Laura (2020)

VSI operates a Technical Committee, which has been in place for decades, that continues to focus on product performance.

FIELD OBSERVATION PROTOCOL STANDARDIZATION

Creates a consistent measure of damage for quantitative and qualitative analysis.

A. No Damage — No noted material or installation failures.

B. Minor Damage— Minimal soffit / fascia /siding damage noted in small localized areas that could be easily repaired.

C. Moderate Damage— Substantial damage to soffit and/or siding in a broad substantial part of a wall or soffit area, but NO damage that compromises the structural integrity or building envelope.

D. Major Damage— Substantial damage to siding and/or soffit which was also a part of the structural or building envelope being compromised.

E. Other Materials / Systems Damaged - Other parts of building material or systems damaged.

F. Fire / Tree Damage – Fire and tree damage to structure as a result of the hurricane event.

Note: In the past, some non-industry reports on product performance in some cases have been vague and non-specific to actual cause of failure.

HURRICANE ISAIAS

- Hurricane Isaias was a high-end Category 1 hurricane causing extensive damage across the Caribbean and the east coast.
- It was named on July 23, 2020. On August 1, 2020, the storm made landfall on North Andros, Bahamas and then made landfall near Ocean Isle Beach, North Carolina on August 4, 2020.

GENERAL ANALYSIS AND DAMAGE ESTIMATES

Structures (homes) Reviewed

- Oak Island 400 to 500 East/West Beach Drive, Oak Island, NC
- -Approximately 70% to 80% of homes used polymeric cladding
- Holden Beach 100 to 150, Ocean Blvd East, Holden Beach, NC
- -Approximately 50% to 60% of homes used polymeric cladding

General Damage Noted

- Damage was both storm surge (water), wind and fire.
- Note only catastrophic / complete damage was fire related

Number of estimated damaged structures with polymeric cladding:

- 40 (<10%) Oak Island
- 10 (<10%) Holden Beach
- Major damage (non-catastrophic) was storm surge related

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GENERAL OBSERVATIONS

General observation: Properly specified product installed correctly performs in high-wind regions.

Observations when failure occurred:

- Most noted failures were fascia related
- Soffit failures were noted and were more vulnerable when used in large porch ceiling applications and as a ceiling application under homes (homes are built using piles)
- Siding failures occurred more in residing applications than new construction
- Fastener corrosion contributed factor to siding failure in a number of cases
- Gable ends have more noticeable failures
- Instances of using J-channel without utility trim/punch locks or as starter strip were noted
- Still noticeable nonhigh-wind single nail hem products used

RECOMMENDATIONS

- Highlight need for use corrosion resistant fasteners
- Consider broadening soffit instruction to include more specifics on porch ceiling installation and bottom of home ceiling application, new code changes address this issue
- Consider highlighting fasteners that can be used without hitting stud (e.g. ring shank or screws)
- Study and provide stronger direction on fascia installation
- Continue focus on coastal applications and education of installers, builders, code officials

HURRICANE LAURA

- Hurricane Laura was a Category 4 hurricane causing extensive damage across the Caribbean and gulf coast of western Louisiana.

- Laura rapidly weakened as it moved inland, becoming a tropical storm later that day, and weakening further to a tropical depression the next day.

- The storm greatly affected agricultural and logging interests, but its course through sparsely populated areas spared metropolitan Houston and New Orleans.

- The city of Lake Charles, Louisiana, took the brunt of the storm, suffering widespread wind damage.

GENERAL ANALYSIS AND DAMAGE ESTIMATES

Structures (homes) Reviewed

Beaumont, Nederland, Port Arthur, Por Neches

- Approximately 30%-40% of homes used polymeric cladding, 20% of which suffered minor damage.

Alexandria, Boyce, Pineville, Louisiana

- Approximately 30%-40% of homes used polymeric cladding, 20% of which minor damage.

Lafayette, Louisiana

- Approximately 40%-50% of homes used polymeric cladding, 10% of which minor damage.

Lake Charles, Jennings, Louisiana

- Approximately 30%-40% of homes used polymeric cladding, 80% of which minor to moderate damage.
- All construction types and cladding types were damaged.
- Some catastrophic damage, more related to falling trees than direct wind issues.

GENERAL OBSERVATIONS

Improper Installation

- Siding failures are the result of improper nailing patterns, often wider than 16-inches on center
- Instances of improper use of J-channel were noted
- Lack of solid sheathing, especially at gable ends and chimneys, may have contributed to siding blow off, as without solid sheathing (and at gable ends, also drywall) the siding becomes subject to more severe wind pressure without equalization
- Soffit failures were noted, most in combination with fascia failure, code changes correct this issue
- Non-high wind related product, improper specification
- All materials impacted in Lake Charles region, note multifamily construction and brick construction with major damage

RECOMMENDATIONS

- Education On Proper Installation / Inspections
  - Installers, Building Officials, Architects, Designers
- Focus on siding installation performance at gable ends, chimneys and other locations without interior drywall
- Highlight fasteners that can be used without hitting stud, for example as allowed ring shank nails
- Study fascia installation

ASTM D5206 RESEARCH ON INSTALLATION

VSI Technical Committee conducted ASTM D5206 wind load testing at Intertek in York, PA in August 2020

- Testing provided insight on common installation and known installation errors
- Testing was conducted on standard product and coastal product

FINDINGS

- "Economy panels" (non-coastal) are not as susceptible to nail withdrawal under normal wind conditions and therefore improper installation, meaning nails hitting studs, will be less problematic
- "Premium panels" (coastal) must be installed properly. Improper installation will result in fastener failures in high wind events. Alternative installation should focus on stronger fasteners as fastener withdrawal is the noted means of failure in high wind scenarios utilizing alternative fastener spacing

- J-channel cannot be used as a starter strip as doing so greatly reduces the wind performance of the system
- Current punch lock specifications are adequate for performance in coastal settings

Question & Comments

THANK YOU!