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ROOF SHINGLE HAIL IMPACT RATINGS

| Overall Rating | Dents/Ridges | Tears | Granule Loss |
|----------------|--------------|----------|--------------|
| Excellent | Good | Good | Good |
| Good | Marginal | Good | Good |
| Marginal | Poor | Marginal | Marginal |
| Poor | Poor | Marginal | Poor |

Legend: Excellent (Green), Good (Light Green), Marginal (Yellow), Poor (Red)





- 
- 1. Embers***
 - 2. Flames***
 - 3. Radiant Heat***



THE RACE IS ON

Witch Creek Fire Investigation



2007



Waldo Canyon Fire Investigation

Ember Attack & Radiant Heat



2012

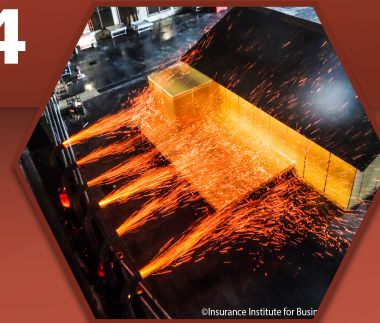


Vents

2013



2014



Vulnerability of Decks

2015

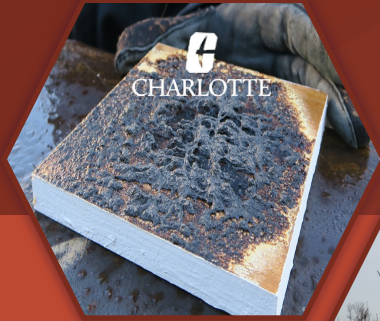


2016

Fire Spread

SCIENCE IS CATCHING UP

Coatings & Gels



2017

Wine Country Fires & Camp Fire Investigations



Home Hardening



2018

Home Ignition Zone



2019

Roof Cover Performance



2020

Fuel Breaks



2021

Structure Separation & Wind-driven Fire



2022

Marshall Fire Investigation



2023

Maui Fire Investigation





5 feet

Zone 0



Roof



A dark, narrow tunnel with a bright light source at the end, surrounded by glowing orange lines. The tunnel is illuminated by a bright light source at the far end, creating a strong glow. Several glowing orange lines are visible, some hanging from the ceiling and others on the walls. A small blue light is visible on the left wall. The overall atmosphere is dark and mysterious.

Vents



Fences



Windows



ROOF

- ✓ Choose a Class A fire-rated roof maintained clear of debris
- ✓ Choose noncombustible gutters & downspouts

BUILDING FEATURES

- ✓ Install ember- & flame-resistant vents
- ✓ Ensure 6-inch vertical noncombustible clearance at base of wall

DEFENSIBLE SPACE

- ✓ Create & maintain the home ignition zone (0-5 ft) including the removal of branches that overhang this area
- ✓ Clear & maintain the underdeck area; enclose low-elevation decks
- ✓ Maintain yard clear of debris
- ✓ Replace combustible fencing within 5 ft of the home

WILDFIRE PREPARED HOME + PLUS

ADDITIONAL MITIGATION

- ✓ Remove back-to-back fencing
- ✓ Eliminate combustible siding
- ✓ Enclose eaves
- ✓ Enclose under bay windows
- ✓ Upgrade to a wildfire-resistant deck
- ✓ Upgrade windows & doors
- ✓ Cover gutters
- ✓ Move outbuildings at least 30 feet away

**WILDFIRE
PREPARED**
— A PROGRAM OF IBHS —

+ Community

- We must find the nudges to get parcel-level measures put in at scale.
- Communities can break the chain of conflagration & act as fuel breaks, not fuel sources.
- We can apply lessons learned through the IBHS FORTIFIED Home program's success.

An aerial photograph showing a city with a large, dark, ash-covered area in the background. The city buildings and roads are visible in the foreground and middle ground. The sky is overcast. The image is framed by a dark red border at the top and bottom.

**CONNECTIVE
FUELS:**

**Pathways of manmade
materials or vegetation**





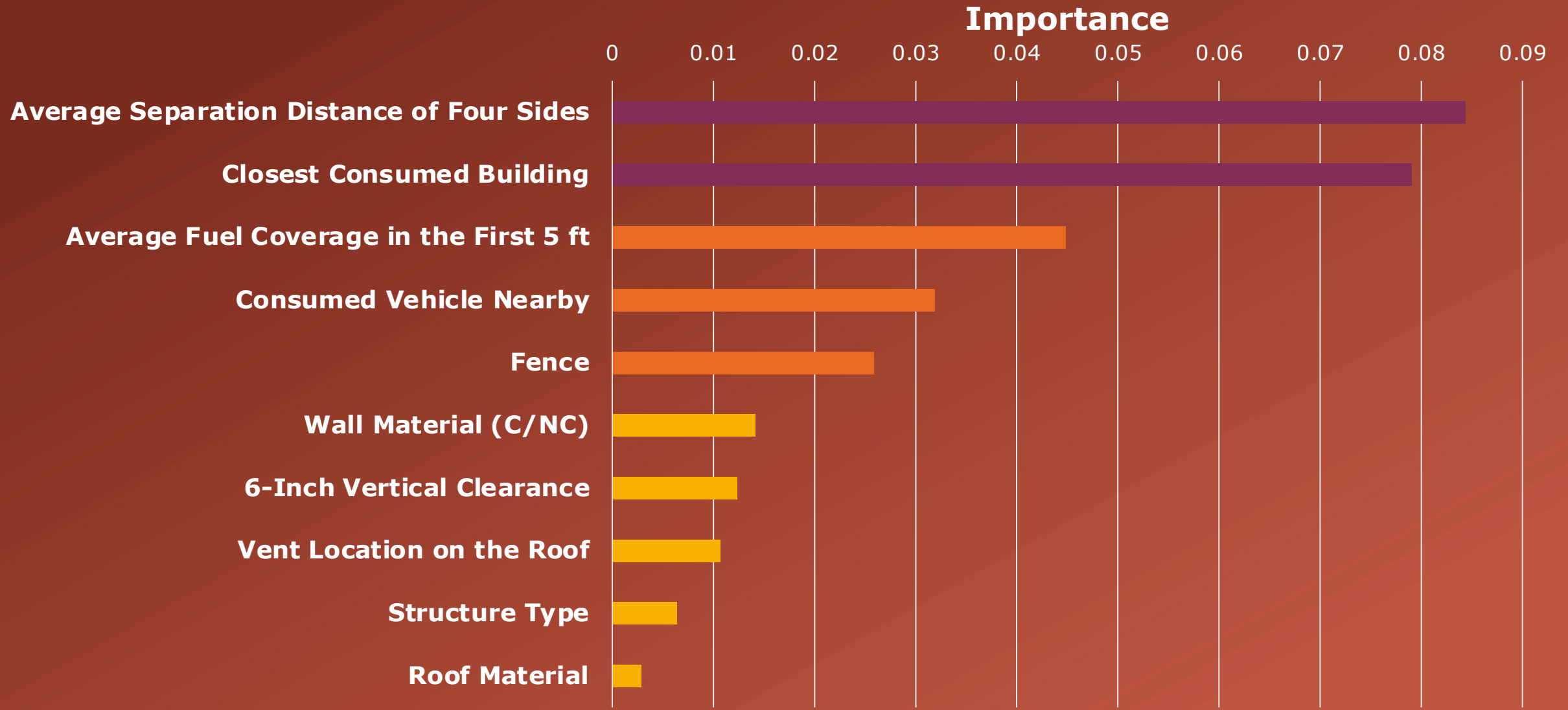
CONFLAGRATION FACTORS

Structure Density

Connective Fuels

Building Materials

LAHAINA: Conflagration Factors





A large fire is burning at night in an industrial setting. The fire is intense, with bright orange and yellow flames reaching upwards. It is burning in front of a building with a dark roof and a window. To the right, there is a large metal structure, possibly a storage tank or a piece of machinery, which is also partially obscured by the fire. The sky is dark, and there are some lights visible in the background. The fire is the central focus of the image, and it is burning very brightly.

Computer Simulations

Field Observations

Experimental Testing



Science informing Wildfire Policy

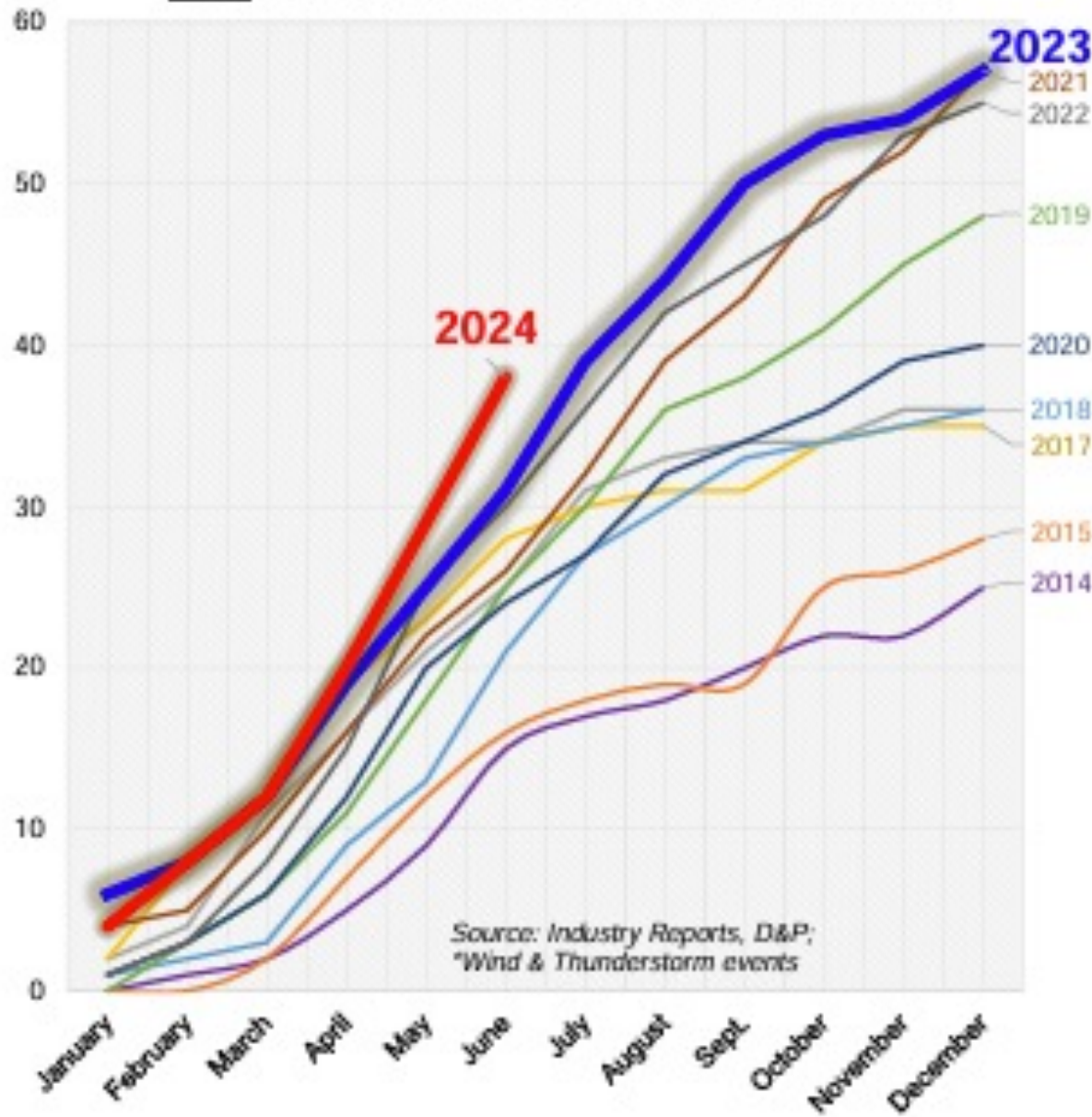


➔ ibhs.org

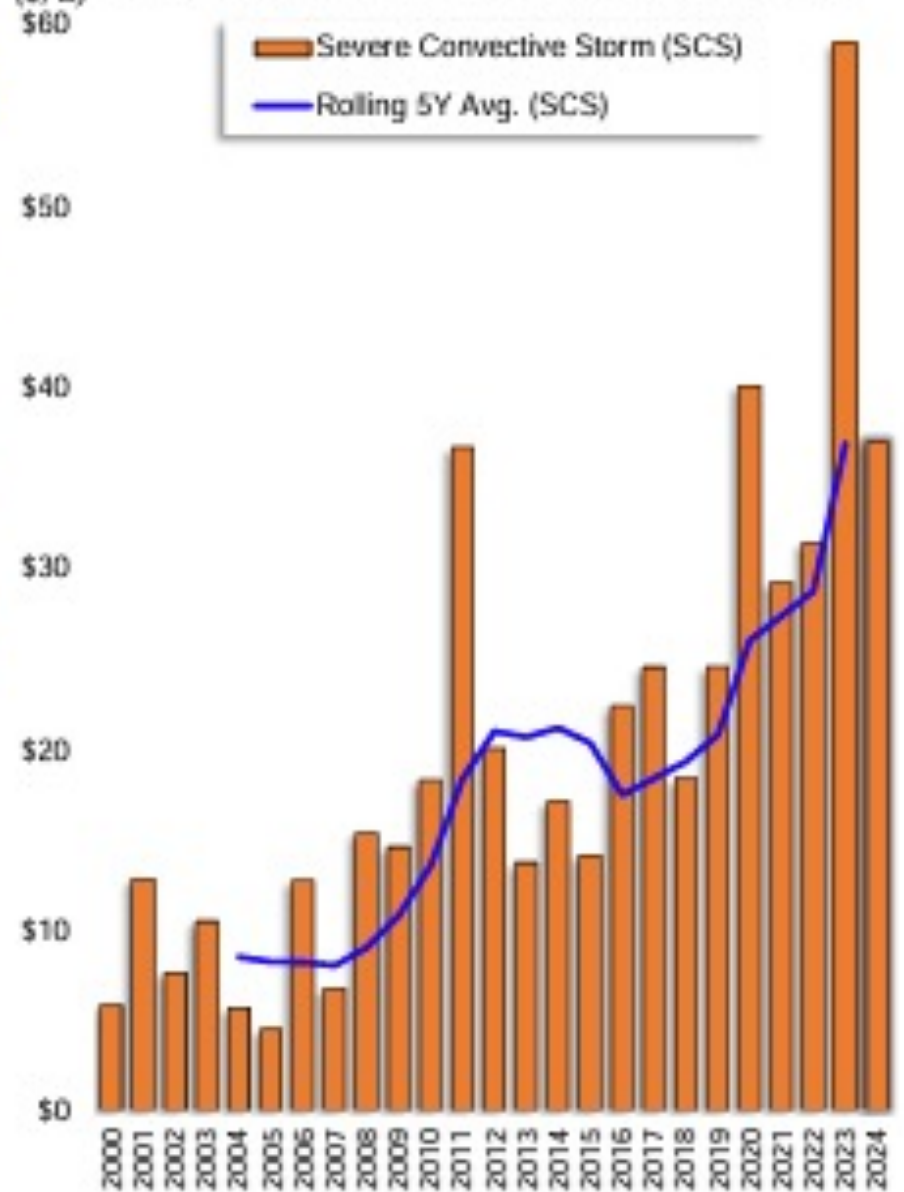


🐦 [IBHS_org](https://twitter.com/IBHS_org)

U.S. Cumulative SCS* Count 2014-2023

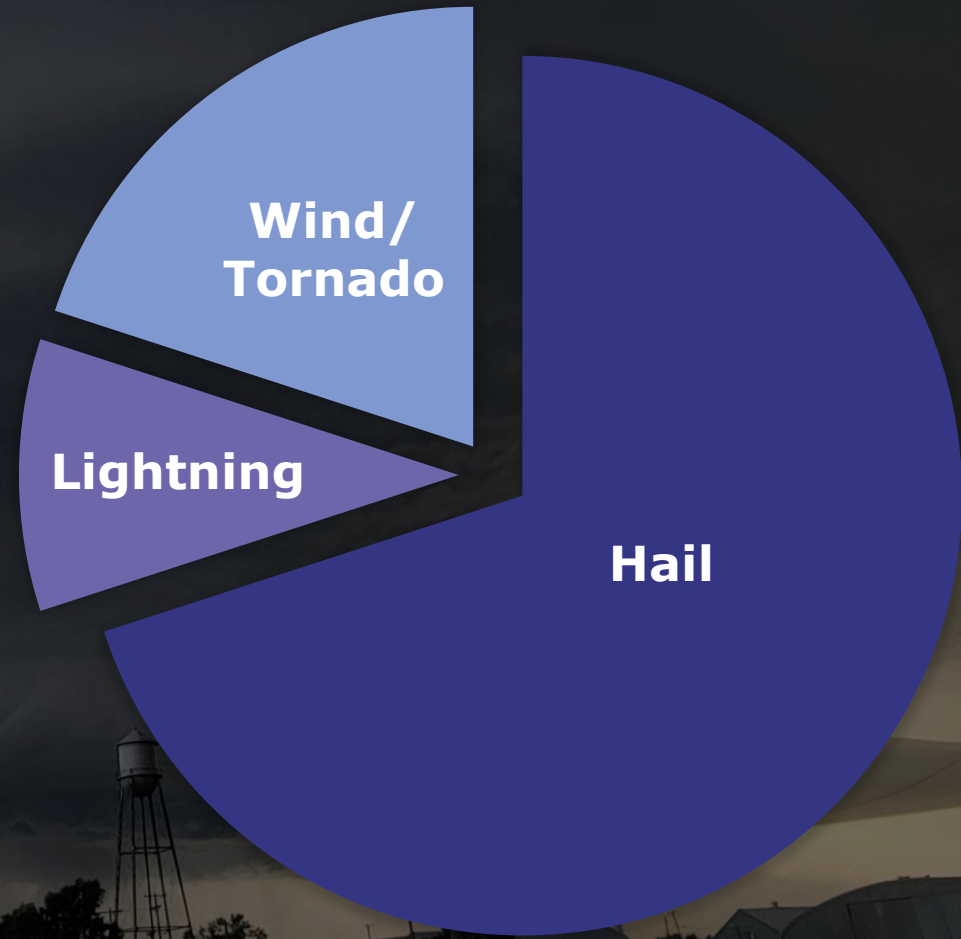


U.S. Annual Cat Losses (SCS Events*)



Source: BLS, D&P Analysis; *Inflation-Adjusted

Hail accounts
for
70%
of average annual loss.



Severe Convective Storm Hazards and Loss

Loss by SCS hazard from Moody's Risk Management Solutions

IBHS Hail Research Program:



Evaluate existing test standards



Field measurements

What properties need to be replicated



Manufacturing repeatable laboratory hailstones











































New test protocol

Objective damage ratings

Relative product performance

ROOF SHINGLE HAIL IMPACT RATINGS

| Manufacturer/ Brand | Overall Rating | Dents/ Ridges | Tears | Granule Loss |
|---|---|---|---|---|
|  StormMaster® Shake |  |  |  |  |
|  Roofing NorthGate® |  |  |  |  |
|  Roofing Products™ Legacy® |  |  |  |  |
|  Roofing Products™ Vista® |  |  |  |  |
|  Timberline® ArmorShield™ II |  |  |  |  |
|  TruDefinition® WeatherGuard® HP |  |  |  |  |
|  Roofing Landmark® IR |  |  |  |  |
|  Cambridge™ IR |  |  |  |  |

Key  Excellent  Good  Marginal  Poor

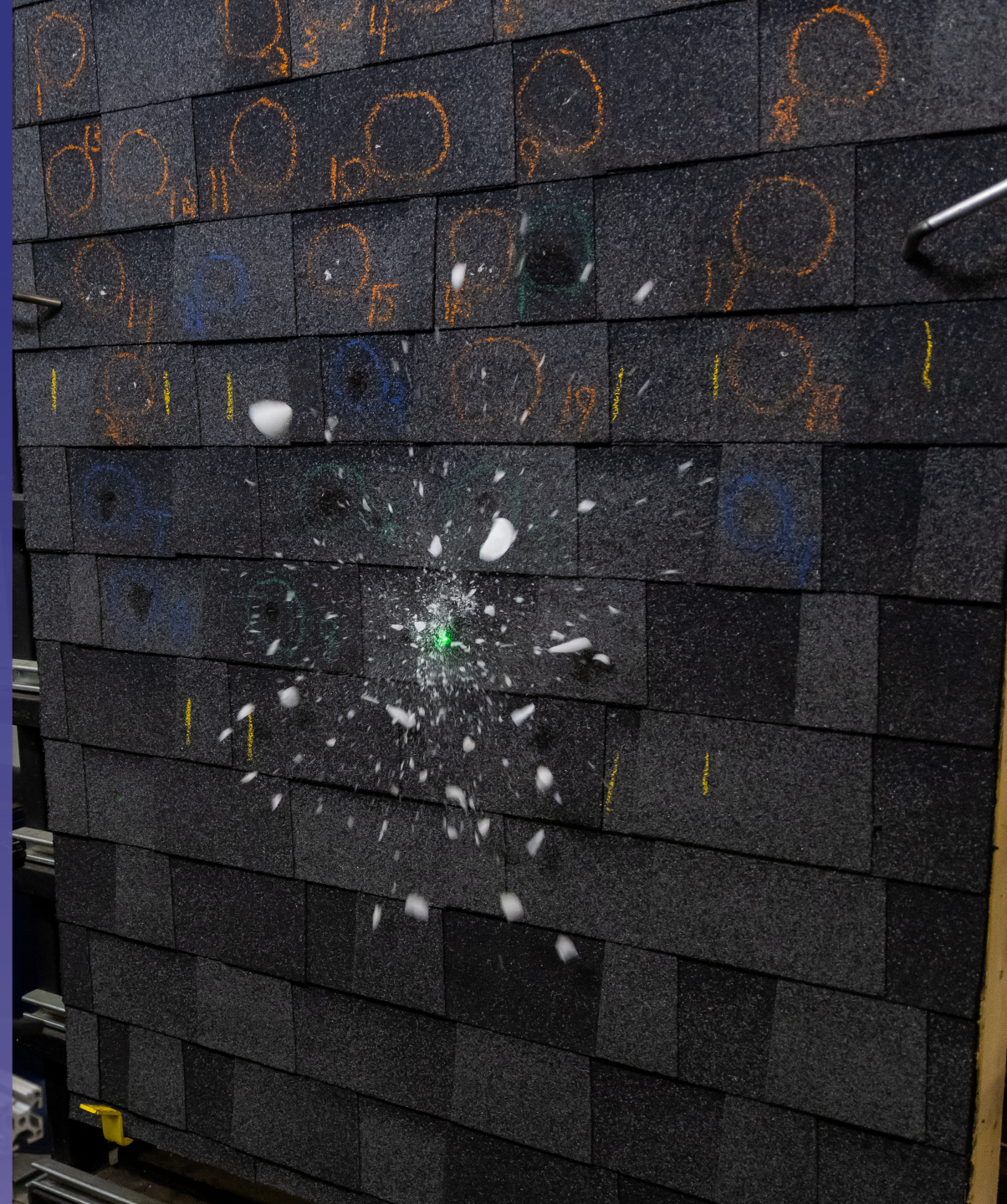


**NEW IMPACT-RATED
products perform**

10-35%

BETTER than new
conventional shingles

in IBHS lab testing with 2-inch hail.


















































For 5-year-old shingles,
IMPACT-RATED
products perform
up to **50%**
BETTER than
conventional shingles
in IBHS lab testing with 2-inch hail.

GOOD and **EXCELLENT** performing asphalt shingles could **ELIMINATE** the need for **ONE ROOF REPLACEMENT CYCLE.**

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|  TruDefinition® Duration FLEX® |  |  |  |  |
|  Roofing Landmark ClimateFlex® |  |  |  |  |
|  Timberline® Armorshield™ II |  |  |  |  |
|  Roofing NorthGate® |  |  |  |  |
|  StormMaster® Shake |  |  |  |  |
|  Roofing Products Vista® |  |  |  |  |
|  Roofing Products Legacy® |  |  |  |  |
|  Nordic™ |  |  |  |  |
|  BUILDING PRODUCTS StormFighter® |  |  |  |  |

Key  Excellent  Good  Marginal  Poor

A night scene of a hail storm. Large hailstones are falling from the sky, creating a dense, white, and chaotic pattern against the dark background. In the distance, a car is visible, its headlights and taillights glowing. The overall atmosphere is dark and stormy.

HAIL is TRADEOFFS.

**Where does the
MATH work?**

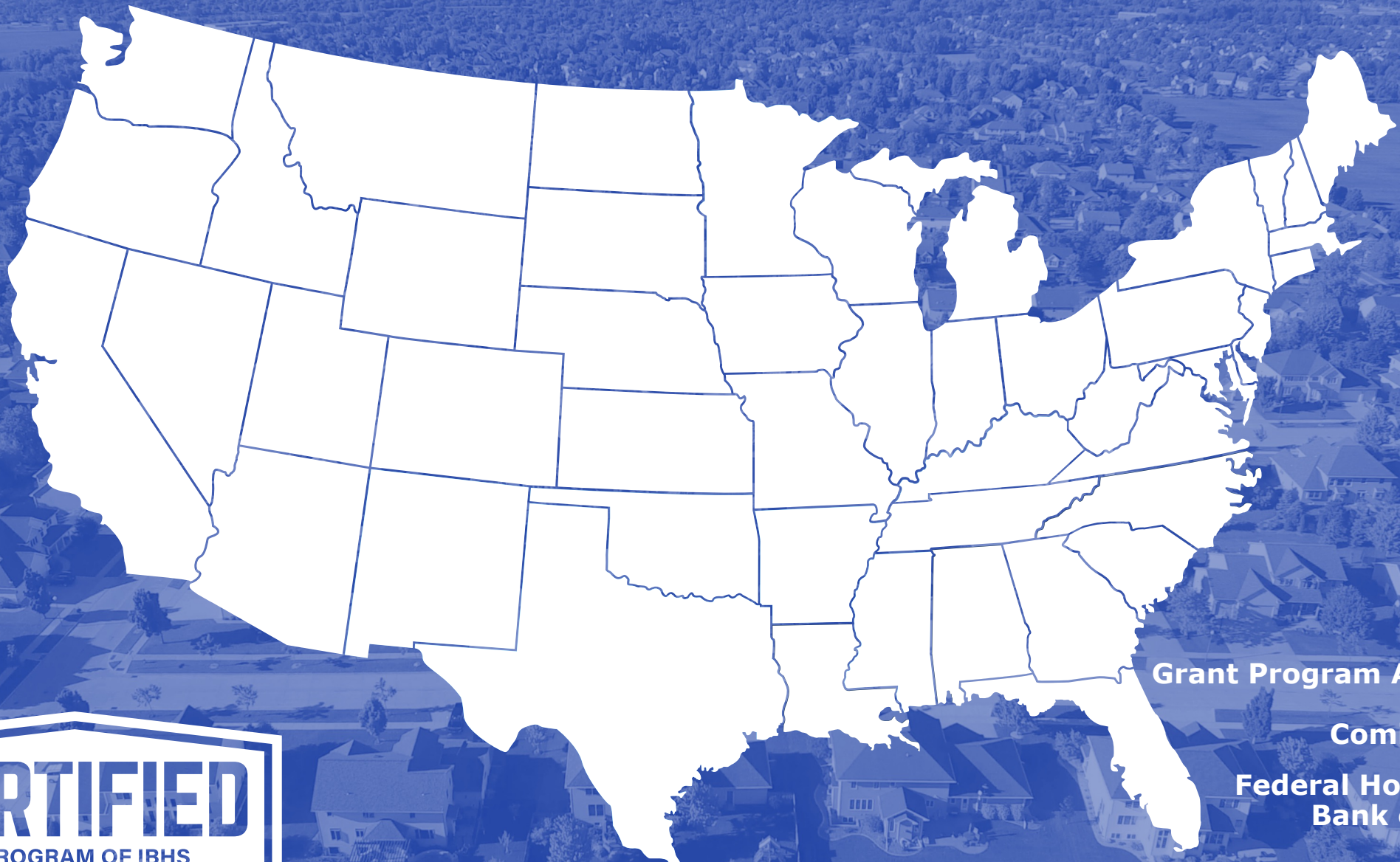


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WILDFIRE PREPARED
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Grant Program Available



Coming Soon



Federal Home Loan
Bank of Dallas





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