Exposure of Buildings to Wildfires: Vulnerabilities and Mitigation Strategies

Institute for Catastrophic Loss Reduction Webinar
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Exposures / Vulnerabilities / Mitigation
IBHS Mission

To conduct objective, scientific research to identify and promote effective actions that strengthen homes, businesses and communities against natural disasters and other causes of loss.
IBHS Research Center
Test Chamber

- Wind speeds up to 130 mph (~58 m/s)
- 105 fan array
- Diameter approximately 5.5 ft (~1.7 m)

- Full-scale buildings
- Residential or commercial
- One- to two-story
Wildfire Exposures: Embers
Direct versus Indirect

Direct

Indirect
Indirect
Wildfire Exposures: Radiant Heat
Wildfire Exposures: Flame Contact
Home-to-Home
A Coupled Approach
Building Codes / Guidance
Our House

- Roof
- Vents
- Siding
- Deck
- Fence
Defensible Space Zones (In Canada “Priority Zones”)

IBHS Guidance on Defensible Space

Zone 1:
0-5 feet (0~1.5 m), near-building

Zone 2:
5-30 feet (~1.5 ~9 m)

Zone 3:
30-100 feet (~9 m ~30 m) or to the property line
Defensible Space: 0-5 ft (0-1.5 m)
Fire Rating
Roof Edge
Roof - Drip Edge
Vents

- Through-roof
- Gable end
- Under-eave (inlet)
- Foundation & other
Vents – Under-eave
Vents – Ember Entry
Vents – Mesh Size

- 6 mm
- 3 mm
Vents – California’s Chapter 7A
Vents – External Baffle
Vents – Debris Accumulation
Exterior Walls
Exterior Wall – Ground-to-Siding

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Exterior Walls – Near-Building
Exterior Wall – FR Coating
Exterior Walls - Windows

University of California Cooperative Extension
Exterior Walls – Window Screens
Deck Vulnerabilities
Deck: Attachment Detail
Decks: Ember Exposure

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## Decks: Experimental Results

<table>
<thead>
<tr>
<th>Name</th>
<th>Composition</th>
<th>Chapter 7A Compliant</th>
<th>Easily Ignited by Ember Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>WPC1</td>
<td>PVC</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>WPC2</td>
<td>PE-1</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>WPC3</td>
<td>PE-2</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>WPC4</td>
<td>PE-3</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>WPC5</td>
<td>PE-4</td>
<td>No</td>
<td>No*</td>
</tr>
<tr>
<td>HW</td>
<td>Wood</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>SW</td>
<td>Wood</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>SW1</td>
<td>FRT Wood</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>
Deck: Ember Intrusion
Wind Flow & Propagation
Fence Vulnerability
Fence: Ground Condition / Design

Privacy

Good Neighbor
Fence: Flame Spread

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Fence: Guidance
Summary

- Exposures
  - Direct and Indirect
- Coupled Approach
  - “Defensible Space”
  - Materials & Design
- Wildland fire-to-home versus home-to-home
Thank You

Please visit www.disastersafety.org
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Questions?