

## Enhancing Fire Hardness in California: A White Paper on Home and Commercial Property Protection



The evolving climate and increasing forest-density have significantly heightened the risks of wildfires, especially in high hazard areas and the Wildland- Urban Interface (WUI). Fire hardening—implementing construction and landscaping measures to reduce wildfire risks—is crucial for homeowners and businesses. This white paper outlines effective strategies for fire hardening, focusing on choice of materials, structural adaptations, and other practices vital for building resilience against wildfires.

**What is Fire Hardening:** Fire hardening refers to making structures more resistant to wildfires by utilizing flame-retardant materials, modifying landscaping practices, and integrating design features that reduce vulnerability. This approach provides not only protective benefits but can also afford home and business owners peace of mind during the fire season.

States are updating codes: Oregon, Washington, California, Idaho, Hawaii, and Arizona have developed building codes and guidelines to address fire hardening, particularly focusing on areas at high risk of wildfires, known as Wildland-Urban Interface (WUI) zones.

### Key Components of Fire Hardening

**Defensible Space:** Creating a buffer between a building and surrounding wildland can slow the spread of fire. This involves clearing combustible materials and vegetation, using fire-resistant plants, and maintaining regular landscaping.

**Material Selection:** The use of fire-resistant materials for roofing, siding, and decks plays a pivotal role in hardening structures.

**Structural Modifications:** Sealing gaps, installing ember-resistant vents, and using non-combustible fences can prevent intrusion by embers, a primary threat in wildfires.

## **Class A and Non-combustible Siding and Roofing Materials That Resist Ignition**

**Roofing Materials:** Roofs are the most susceptible to ignition, given their broad surface and exposure to flying embers. When evaluating roofing materials, it's important to consider not just melting points but also other factors like structural degradation, fire resistance, and how a material will behave under prolonged heat exposure. Each type of roofing material has its advantages and trade-offs regarding fire safety, insulation properties, and durability.

- Steel is considered non-combustible and melts at a very high temperature, typically around 2,500°F (1,370°C). Steel itself won't melt in typical fire scenarios, the coatings might degrade much earlier.
- Clay roof tiles is considered non-combustible and can withstand very high temperatures without melting, generally in excess of 1,800°F (1,000°C). They are non-combustible, making them an excellent choice for fire-resistant roofing.
- Cement and concrete are considered non-combustible do not have a melting point in the traditional sense, as they tend to break down or degrade instead of melting. Concrete typically begins to degrade at temperatures around 572°F (300°C) and can suffer structural damage from prolonged exposure to high heat.
- TPO roofing membranes start to become pliable and may begin to melt at temperatures around 300-350°F (150-177°C). This material is thermoplastic, meaning it can be softened with heat and should be installed and repaired with heat welding.
- PVC membranes may start to soften and possibly begin melting at temperatures between 160-185°F (71-85°C). Like TPO, PVC membranes are also heat-welded during installation.
- Asphalt shingles can begin to melt or soften at temperatures around 150-200°F (66-93°C). However, these materials are more likely to catch fire and degrade rather than melt in the traditional sense.

Class A roofing assemblies can be achieved with these roofing systems when the proper Class A rated underlayment or cover boards are installed. For a detailed break down of Class A rated systems, please contact us.

**Siding Options:** Siding should not only have low combustibility but also be resistant to heat transfer. Recommended materials are:

- Steel panels and Fiber-cement panels.
- Ignition-resistant wood that complies with local fire codes
- Stucco, brick, or stone veneer

## **Fire Hardening Tips**

**Attic Ventilation and Ember Intrusion Prevention:** Ember intrusion through vents is one of the most common ways homes ignite during a wildfire. Incorporating attic and crawl space ventilation systems designed to block embers can drastically reduce this risk. These use small screen apertures (usually 1/8-inch or smaller) and are tested under strong airflow conditions to ensure they can block embers. Some vents use baffle designs that allow airflow but prevent embers from entering.

**Regular Property Maintenance:** Regularly maintain roofs, gutters, and landscaping to remove flammable debris.

**Install Fire Barriers:** Include non-combustible fire breaks such as gravel paths, stone patios, and concrete driveways around structures.

**Upgrade Windows:** Consider double-paned or tempered glass, which is more resistant to heat and can withstand radiant heat from nearby fires.

**Seal Gaps:** Ensure that gaps around roofs, dormers, and eaves are well-sealed to prevent ember entry.

## Conclusion

Fire hardening is a critical strategy for reducing the vulnerability of structures in high-risk fire areas. Through thoughtful selection of materials, regular maintenance, and strategic modifications, homeowners and businesses can enhance resilience against wildfires. For those in high hazard areas and the WUI, these measures are not merely recommendations but essential steps in ensuring the safety of life and property.

By adopting these specific measures detailed in this paper, owners can proactively fortify their homes and businesses against the persistent threat of wildfires.