WILDFIRE RESEARCH FACT SHEET

Reduce the Vulnerability of Your Deck to Wildfire

MANY HOMES LOCATED IN WILDFIRE-PRONE AREAS HAVE ATTACHED DECKS, WHICH CAN POTENTIALLY SPREAD FIRE TO THE HOUSE WHEN IGNITED DURING A WILDFIRE.

A burning deck can ignite siding or break the glass in doors or windows, allowing fire to gain entry into the house. Consequently, making decks less vulnerable to wildfire also makes your house less vulnerable. Reducing the deck's vulnerability requires an approach that focuses on the materials and design features used to build the deck, and creating a noncombustible zone around and under the deck.

EMBER EXPOSURE AND IGNITION

Walking surfaces of decks are either solid surface or constructed using deck boards (with between board gaps). Solid surface decks are commonly light weight concrete or tile. Combustible deck board types include: solid wood and wood-plastic composites (these products are more widely used than noncombustible deck boards). Noncombustible deck board types include: metal and fiber cement.

Recent testing at the IBHS Research Center showed embers mostly lodge between deck board gaps and where deck boards rest on joists. Embers can accumulate and potentially ignite decking and combustible joists. Embers can also fall through board gaps and land on materials stored beneath the deck. It's critical to remove all combustible materials from the under-deck area to minimize the opportunity for ignitions; where resulting flames would impinge on the decking (some wood-plastic decking products are vulnerable to flaming exposures).

IBHS tests also showed that even without vegetative debris in between deck gaps, medium density softwood decking products, such as redwood or western redcedar are vulnerable to ember ignitions. Most wood-plastic composites, along with higher density tropical hardwood, and fire-retardant treated decking products are less vulnerable to embers. The vulnerability to embers in these locations is a reminder to remove debris that accumulates in these areas.

BUILDING CODE REQUIREMENTS

The International Wildland Urban Interface Building Code (IWUIC) and the California Building Code are the most commonly referenced construction codes for wildfire-prone areas; both include requirements that focus on the walking surfaces of decks. Noncombustible products are allowed by both codes.

The California Code provides provisions for accepting combustible decking products. These types of products are more commonly used by homeowners living in wildfire-prone areas across the country. Their requirement governs the amount of heat released when combustible decking is ignited by a gas burner. This mimics burning debris that could be located under the deck, or burning vegetation impinging on the underside of the deck, but does not mimic ember exposure. Combustible decking products that comply with the California Code can be found at: http://osfm.fire.ca.gov/licensinglistings/licenselisting_bml_searchcotest.

The IWUIC prohibits common combustible deck boards with the exception of fire-retardant treated decking (rated for outdoor exposure) and other materials that meet the requirements of an Ignition Resistant Material. However, as of this date, no other materials meet these requirements. The IWUIC allows an enclosed deck option that uses a horizontal construction attached to the bottom of the deck joists. This option should only be used with a solid surface deck. Using this option with deck boards (and the associated gaps), will cause moisture-related degradation problems (corrosion of fasteners and wood rot). Water from rain or melting snow will easily get into the enclosed space and will have a much harder time getting out.

Photo Captions:

- **A** Embers that pass through deck board gaps will land on the ground, or on combustible materials stored under the deck, as shown during this IBHS test.
- **B** The near home noncombustible zone that surrounds the foundation should include a noncombustible area underneath the deck.
- **C** Vegetative debris in between deck board gaps will make this location even more vulnerable to ember accumulation.

RECOMMENDATIONS FOR YOUR DECK:

1. Combustible materials should not be stored beneath decks. This will effectively create a noncombustible zone under the entire footprint of the deck.
2. Routinely remove debris that accumulates in between deck board gaps and debris that can accumulate at the intersection between the deck and house.
3. If the deck is a non-fire-retardant treated softwood deck, consider removing and replacing deck boards within a few feet of the house. Be careful to match the deck board thickness.
4. When building new decks, select deck boards that comply with the California Building Code requirements. If using wood joists, cover the top and part of the sides with a foil-faced bitumen tape product.

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DECK MATERIALS:

Old dry, or degrading, wood decking is extremely flammable and should be replaced. Aluminum decking is available (See Versadeck and its equivalents), it lasts forever and is completely fireproof but expensive. Non-combustible Aerated concrete is currently the highest-rated fire-resistant deck material.

Flame-spread, used to describe the surface burning characteristics of building materials, is one of the most tested fire performance properties of a material, resulting in a Class A, B, or C rating. Testing is done in a specialized combustion chamber and is based on a scale where cement board is rated 0 and red oak is rated 100. Materials are evaluated compared to the rate flames spread on red oak. A long piece of the material to be tested is placed into a 25-foot-long combustion chamber. The first 5.5-feet of material is ignited and monitored to see how quickly fire spreads to the other end. Red Oak takes 5.5 minutes to spread to 19.5-feet. This flame spread rate for Red Oak is arbitrarily assigned a reference score of '100' and other material scoring is a ratio from that. A Class A rating is 0-25, Class B is 26-75, Class C is 76-200. Class A is awarded to fire retardant materials like cement.

If using wood, consider hardwoods such as Black Locust, not redwood or cedar. Keep wood in good condition and always remove debris. Fire retardant coatings are not recommended because they don't weather well and would need to be re-applied regularly. Staining a wood deck does not significantly add to fire susceptibility.

Composite decking is a good alternative. Wood and synthetic materials are combined to form dense boards. Composite decking companies add fire retardants to the inner decking materials. Without retardants, composite decking would be highly flammable, more so than wood. When finally ignited, composite decking will burn hotter than wood, but it is more resistant to ember ignition. However, in the USA, all composite decking sold is rated Class C or better. Class C is comparable to wood decking, but not worse.

Composite decking companies also sell products with Class B (Trex) ratings and some with Class A fire ratings. Timbertech (available at Parr Lumber in Medford) and AmeraDeck offer Class A materials. The Timbertech Class A rated deck boards have no wood content, unlike composite deck boards, so there is no organic material to burn.

DECK CONSTRUCTION:

Structural members of a deck (i.e. deck framing) is best made from steel or aluminum, but this is uncommon. Typically, decks are framed with wood. As deck boards are typically spaced, embers can fall through these cracks and potentially ignite the wood joists supporting the deck. Some companies provide deck boards that are grooved and interlocking, avoiding a space. Current best practices for spaced deck boards recommend wrapping the top of the joists with self-adhesive metal deck flashing or joist tape.

Windblown embers will accumulate along the walls where the deck meets the house. This is a higher risk area for home ignition, especially if the wall siding is made of wood. This vulnerability can be mitigated by replacing the closest deck board next to the house with a non-combustible one, such as metal, or by installing metal flashing. Metal flashing can be installed between the wall and deck connection during deck construction, or along the base of the wall at the junction of wall/deck-surface to seal the gap between deck and wall (where embers will lodge) to protect the siding. Replacing or constructing deck railings with composite materials or metal are another way to enhance the fire-resistance of your deck.

It is critically important to NOT store any combustible materials under the deck or allow vegetation to grow under, or against, the deck. For low decks, you can prevent debris accumulation or ember intrusion by enclosing the deck. This may be done with cement block or brick, cement-board paneling, or by installing 1/8-inch metal mesh as a skirting around the deck. Handyman services can install these types of modifications. Combustible items on the deck like wicker furniture, seat cushions, and mats should be removed when preparing for an approaching wildfire.

Watch this video for more information about deck vulnerability and protection. https://firesafemarin.org/harden-your-home/fire-resistant-decks-patios-porches/