

# Windows and Glass



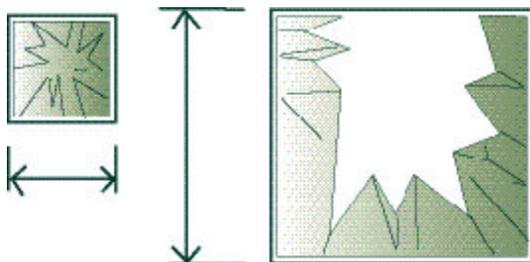
## General

No material is “fire proof.” However, the proper use and assembly of fire-rated building materials can reduce a fire’s spread, and extend the amount of time it takes for a home to ignite and burn.

Windows are the weakest component of your home in relation to wildfire. Glass can fracture within five minutes in direct heat. If the glass breaks and dislodges, your home’s interior is vulnerable to fire. Keep the following in mind when building or remodeling your home:

## Large vs. small windows

If fractured glass stays in place during a fire it can continue to shield hot gasses and open flame from entering your home. However, radiant energy can eventually ignite materials behind the window even with glass in place. Windows smaller than 2’x 2’ will hold fractured glass in place better than larger windows.



*Small and large windows*

## Thermopane or double glazed windows

Thermopane or double-glazed glass will last twice as long as conventional glass windows (ten minutes). The same effect of convective and radiant energy apply, but, because there are two layers, the second pane is protected until the glass on the first has completely failed and fallen away.

## Low E and tempered glass

Tempered glass is resistant to high impact and high heat, while Low E (low emissivity) glass stops the transfer of radiant heat beyond its exterior. The combination of the two provides the best protection in a wildland fire.

## Glass block

Glass block is also a good alternative. Though not as visually appealing, this fire resistive glass has the highest rating (90 minutes).



## Other:

- Solid in-pane shutters can offer an additional 10-20 minutes of protection
- Solid aluminum frames are best. Upgrade frames when windows are upgraded to better insure glass stability and hold during a wildfire.

Windows and glass do not have “*Material Classification*” labels that other building materials have, but the same concept applies. Understand the difference between material *Class* and *Rating*, and use this knowledge when upgrading around your home.

**Ratings** are based on the assembly and layering of building materials and the burn time before ignition. Ratings are divided into classes:

A (the best – 2 to 4 hrs)

B (1hr)

C (20 min).

## **Material Classification (in general)**

### Class A

- Inorganic materials (metal, brick, tile etc.)

### Class B

- Whole wood materials (usually pressure treated, or thick diameter)

### Class C

- Reconstituted wood (plywood, particle board, hardboard etc.)

Material **Class** is categorized by composition, or resistance to fire (combustible vs noncombustible). Class A has the highest resistance; Class C has the least resistance.

**However**, Class A materials generally need an underlayment of additional materials to obtain class A *ratings*. This is because Class A materials conduct heat beyond the exterior.

The combined use of fire-rated building materials, design, and technique will give your home a fighting chance to survive a wildfire.

## **References**

For additional information on protection your homesite, see:

- 6.302, *Creating Wildfire-Defensible Zones*
- 6.303, *Fire-Resistant Landscaping*
- 6.304, *Forest Home Fire Safety*
- 6.305, *FireWise Plant Materials*
- 6.306, *Grass seed Mixes to Reduce Wildfire Hazards*

For more information or assistance contact your local fire department, or the Colorado State Forest Service.