



# Physical Properties and what to consider

## **Part 1: Fire Resistance**

Bushfires are an ever-present countrywide concern and it is important all measures are taken to guard against them. Fortunately homeowners possess more options than ever when it comes to safeguarding their families and properties against the dangers of fire. With adequate preparation, your home is far more likely to survive a bushfire.

In this guide we will be covering the natural fire-resistance properties of roof tiles.

## **GOVERNMENT STATISTIC**

Around 90% of homes destroyed in bushfires are a result of travelling embers. Embers are capable of travelling many kilometres so even homes outside the bush are vulnerable.

## ***NSW RURAL FIRE SERVICE***



## Why are Roof Tiles flame resistant?

Roof tiles are crafted from natural, non-flammable resources including clay, cement, sand and even water. Because all these assets are fire-resistant, roof tiles are incredibly difficult to burn.



**FACT:** Homes built on flat elevations offer better natural fire defence than properties on hills. This is because wind accelerates at high elevations meaning flames burn faster uphill and slower downhill.



## Why Fire Resistant Roof Tiles Affect Everyone

The dangers of external fire are always present regardless of whether you live in the bush. Embers from a bushfire are capable of being carried dozens of kilometres by the wind only to settle on your own home or close vicinity.

While yours and your family's safety are the top priority, installing roof tiles, will make your property significantly easier to defend.



### FAST FACTS

- Roof tiles minimise heat transmission, meaning they are non-combustible.
- The already effective fire performance of roof tiles can be enhanced with sarking.
- Roof tilers stand by the quality of their products, hence having a warranty for 50+ years for terracotta and 35+ years for concrete roof tiles.



**Roof tiles will not release harmful contaminants into the atmosphere during a fire emergency; this is because no harmful toxins are involved during manufacture.**



## What is a Roof Tile Rating for Fire

In Australia, all roof types are assessed for their performance during a fire and assigned a Class rating A, B or C with A representing the highest quality. Roof tiles are rated Class A for their superior performance, making them an optimum option for fire defence. To achieve Class A, a roof must pass a:

- Experience a flame spread of 6 feet
- Endure for 2-4 hours before igniting
- Enduring 15 cycles of a gas flame being turned on and off
- Withstand a burning brand measuring 12 x 12



## Sarking

Under the National Construction Code, it is mandatory that all residential tiled roofs are installed with sarking. This is because of the dangers of bushfires in dry regions as well as the potential for hot embers to travel long distances in a breeze.

Sarking is a thermal insulator sheet that is applied to your roof prior to tile installation. It acts as a second skin, improving the already impressive fire resistances of roof tiles to create a result that stretches the maximum.

Besides offering enhanced fire protection, sarking also:

- Improves thermal performance, limiting the volume of heat that passes into your home
- Prevents water entry during rainfall
- Limits the amount of dust that filters down into your home
- Protects your home from moulds that damage your roof and cause leaks.



## Bushfire Insurance

Between 2008 and 2013, weekly bushfire tendencies increased by 40% according to ABC News.

If you live in an area that is vulnerable to the dangers of bushfire, then it is doubly important that you check to see that your home insurance covers you in the event of emergency.

Though most covers include fire as part of their policies, they might be referring solely to house fires. Actively make sure you are covered by bushfires by contacting your provider, if you are not covered then you need to take action. Insurance companies will be more reticent to providing support after a bushfire, particularly if you have followed satisfactory steps to defend your home. This includes the proper installation of roof tiles on account of their natural fire resistance properties.



## Common Features in Bushfire Housing Design

After the Black Saturday bushfires, many architects and designers sought to bring innovation to the Australian housing scene with improved bushfire resistant developments that did not sacrifice style over safety.

Some of these features include:

- **Terracotta roof tiles:** due to their innate ability to reflect radiant heat.
- **Flat roofs:** Because wind speed increases at higher elevations, homes are designed to be as low as possible.
- **Single Storey:** This again relates to wind speeds at higher elevations.
- **Brick and limestone floor tiling:** Natural, eco-friendly, bushfire resistant and can be easily implanted indoors and outdoors.



## How to make your Home Safer in Bush Fire prone zones

- **Clean your gutters:** Over time leaves, sticks and other flammable materials may collect in your gutters. Travelling embers that settle on them can spark a fire.
- **Consider roof design:** Certain roof shapes are more vulnerable than others. Because wind force increases during bushfires, roofs with poor wind resistances really struggle.
- **Clear away foliage:** Ensure adequate distance is kept between your home and any combustible sources.
- **Turn off electricity and gas prior to bushfire:** The modern home is prevalent with devices that can cause more harm than help during a fire.
- **Save water:** Prior to attack, fill your bathtub and/or suitable containers with clean water in case water supply is cut.



## Top 7 Fire Safety Rules

Is your home fire safe?

1. Check your fire alarm every 6 months to ensure it is working, if necessary refresh the batteries.
2. If you make frequent use of the chimney, make sure it is cleaned and well ventilated. Ensure it is covered with a screen when active.

3. Turn off power points when not in use.
4. Make sure your insurance policy covers bushfire.
5. Trim trees that make immediate contact (as in actually touching) your dwelling.
6. Replace outdoor furniture and equipment, especially devices such as barbeques.
7. Prior to an attack check in with your neighbours, find out what they are doing and offer assistance.



## When Fire Protection measures need to be taken (Timeline)

If you live in the bush, there are many steps you need to take to be ready for bushfire season.

1. Ensure your roof is fitted with tiles and that it is properly sarked (April – May)
2. Form and discuss a fire survival plan with your family. This can be easily done with the MyFirePlan mobile app. Be sure to review safety procedures once a year (June)
3. Clean your roof guttering (July)
4. Clear away flammable materials in close proximity too, or touching your property (October – November)
5. You are now suitably prepared for bushfire season (December – March)



## Roof Tiles V Steel Roof Considerations

Both steel roofing and roof tiles are renowned for their ability to withstand fire and both fall within the Class A spectrum. However there is a big difference between the two different roof types in that roof tiles are poor heat conductors, meaning radiant heat during a bushfire will not quickly overpower the interior of your home during an emergency.

However steel and metal roofs are excellent thermal conductors. Meaning they will absorb far more heat during a bushfire preventing internal temperatures from skyrocketing.



## Bushfire Protection Methods

- Erect buffer zones around your home that will slow down the advancement of bushfires. These can be strategically placed vegetation beds or walls of stone masonry.
- Perform a roof inspection, especially if your roof is old. Loose shingles, sheeting or tiles are not always obvious and embers can potentially sneak through them into your home.
- Tend your garden regularly, mowing the lawn, clearing away loose sticks and trimming trees not only keeps your home bushfire safe, but beautifies your backyard too.





## Quick Terminology Guide

**BAL:** Stands for Bushfire Attack Level, is a rating that determines the properties vulnerability to bushfire attack.

**Embers:** Hot particles scattered by fire that can cause a bushfire to spread.

**Fire Frequency:** The likelihood of a fire recurring in a particular area.

**Forest Fire:** A fire that starts in dense woodland, can sometimes also be classified as a bushfire.

**Fuel:** Any material or resource that can easily catch alight and propagate bushfire.

**Natural barrier:** A spread of non-flammable resources that inhibits the advance of fire.

**Point of Origin:** The site where a bushfire first starts.

**Sarking:** A film membrane applied to the roof frame before roof tiles are installed. Is an insulator that improves the performance of roof tiles.



## Resources

For more detail on technical content, please find in:

<https://rtaa.blob.core.windows.net/media/1419/the-properties-of-roof-tiles.pdf>

For more resources on bush-fire study:

<http://www.rtaa.com.au/technical#tab2>

For more resources in bushfire safety and preparation:

<https://www.rfs.nsw.gov.au/resources/bush-fire-survival-plan>

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