



Community Fire Safe

SPRINKLER SYSTEMS

Fire protection of a property cannot rely on one factor; there will always be a number of measures which, when combined, will provide the best fire protection. However, when homes are located in areas of extreme fire danger, an external sprinkler system should be considered as an important part of the total fire protection plan. Before installing a system the following three points **must** be considered:

1. Are you sure that someone will be home to turn the sprinklers on in the event of a wildfire? If this condition cannot always be met it may be wiser and cheaper to consider placing more emphasis on passive forms of fire protection like vegetation management and spark and ember proofing (refer to CFS Wildfire Fact Sheet No.15 – “Landscaping for Fire Protection”).
2. Do you have sufficient water to enable a sprinkler system to operate for two to three hours? Reticulated mains water is not always available nor can it be relied upon. During a major fire the increased demand may reduce volume and pressure to many houses. Therefore, it is strongly recommended that an independent water supply of at least 22 000 L, be established.
3. Do you have a means of providing adequate water pressure to operate the system? Like mains water a major fire may also cause the electricity supply to fail and on a day of extreme fire danger ETSA will turn the power supply off. Therefore, it is important not to rely on an electric pump to supply pressure - a back up pump driven by a small petrol or diesel motor is essential.

How houses Burn

During a wildfire houses are subjected to radiant heat, direct flame contact and ember attack. Radiant heat and direct flame contact occur as the fire front passes the home which only lasts for 5 – 15 minutes. Ember attack, however, can last for up to one hour before the fire front arrives and many hours after it has passed. Research has shown that ember attack is the major cause of houses burning during wildfires.

Purpose of Sprinkler Systems

Based on the above understanding, sprinkler systems may be designed for two purposes:

1. To reduce the impact of radiant heat, direct flame contact and ember attack on the home by supplying a curtain of water that wets down the roof and walls.
2. To reduce fire intensity by wetting down vegetation surrounding the home.



Roof mounted system designed to reduce the impact of radiant heat, direct flame contact and ember attack on the home.

What Sort of Sprinkler System Do You Need?

Before designing a sprinkler system for your home it is important to establish what sort of system you require. The following checklist asks some simple questions about the design, construction and condition of your home. If you answer **yes** to any of the questions your house may benefit from a sprinkler system which reduces the impact of radiant heat, direct flame contact and ember attack by wetting down the roof and walls. If you answered **no** to most of the questions then a system designed to reduce fire intensity by wetting down vegetation may suffice.

Checklist:

	Yes	No
• Is your home constructed from flammable material such as vinyl weatherboards or timber?	<input type="checkbox"/>	<input type="checkbox"/>
• Does your home have multiple or split-levels and a high pitched or complicated roofline?	<input type="checkbox"/>	<input type="checkbox"/>
• Does your home have a poorly fitting tiles or metal sheets on the roof?	<input type="checkbox"/>	<input type="checkbox"/>
• Does your home have gaps in the eaves and exposed vents etc?	<input type="checkbox"/>	<input type="checkbox"/>
• Does your home have an open underfloor space, exposed timber decking or pergola?	<input type="checkbox"/>	<input type="checkbox"/>
• Does your home have large exposed windows that face the most likely direction of fire?	<input type="checkbox"/>	<input type="checkbox"/>
• Was your home built prior to changes in the Building Code of Australia in 1985?	<input type="checkbox"/>	<input type="checkbox"/>
• Is there an abundance of unmanaged vegetation close to your home?	<input type="checkbox"/>	<input type="checkbox"/>

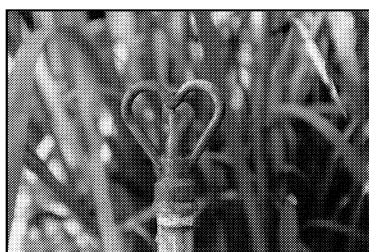
1. Reduce Impact of Radiant Heat, Direct Flame Contact and Ember Attack

Roof mounted sprinkler systems can be designed to reduce the impact from radiant heat, direct flame contact and ember attack. They are best designed mounted at the gutter line and angled out to provide a mist of water droplets onto the roof and direct an even curtain of water downward over the walls.

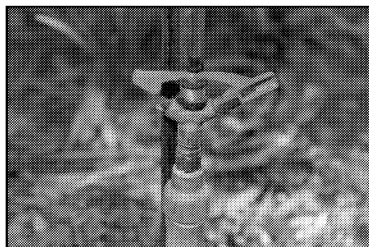
Butterfly sprinkler heads or deluge spray systems provide the optimum water coverage. Be aware that some sprinkler heads produce water droplets that are too fine, blowing away or evaporating in strong winds. Other sprinkler heads produce water droplets that are too large or infrequent, providing inadequate protection from radiant heat.

Where possible locate sprinklers over doors and windows as these are the weak points in the wall area and mount sprinklers close enough together to provide an overlap of spray.

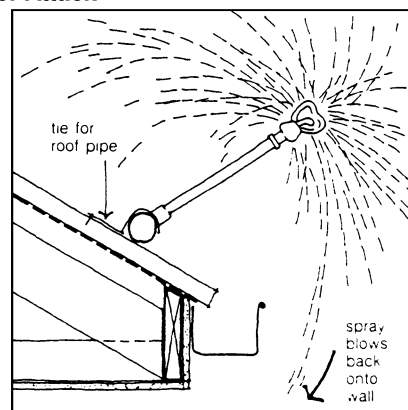
For specifications regarding the spacing of sprinklers and their performance consult your distributor.



Butterfly sprinkler head



Twin jet impact drive sprinkler



*One method of mounting roof sprinklers
Showing water spraying over roof and walls*

2. Reduce Fire Intensity

Ground based sprinkler systems can be designed for reducing fire intensity by wetting down vegetation around the home and may even be an extension of your garden watering system.

Butterfly sprinkler heads, deluge spray systems or impact drive sprinklers may all be used for this purpose. Be aware, however, that impact drive sprinklers take a long time to wet down an area. It is recommended, therefore, that impact sprinklers are turned on the night before a bad fire danger day (or very early in the morning) and run for as long as it takes to sufficiently wet down the vegetation surrounding your home. Always keep enough water in reserve in case a fire does eventuate.

Sprinklers can be mounted on metal risers spaced around the building and fed from an underground pipeline, forming a main ring around the home. This system can be mounted at a distance of 10 metres from the house and sprinkler heads can be set 10 metres apart so that 100% overlap of the spray is achieved. If using impact drive sprinklers they should be adjusted to complete a full rotation every 10 to 15 seconds.

Installing Sprinklers

When installing roof mounted sprinklers the supply pipes to the sprinklers should be metal and can be set on the roof above the gutters under the eaves or on the fascia under the gutter. The sprinkler heads can then be set on metal risers to get the desired water coverage.

When installing ground based sprinklers all above ground piping including risers to taps and sprinklers should be metal. The ring around the house, however, can be plastic provided it is buried at least 300mm underground.

A hose that can reach right round the house needs to be connected to the system. The hose should be a minimum of 19mm in diameter and fitted with an adjustable firefighting nozzle that is capable of withstanding the pump pressure. It should also be independent of the sprinkler system so that water can be conserved and in high-risk areas it should be made of rubber as plastic hose can melt when subjected to extreme heat.

Pumps

You will need an appropriate portable pump to provide sufficient water pressure to operate your sprinkler system effectively. For roof mounted systems a 38mm centrifugal pump close coupled to a 5hp (3.7kW) petrol engine should provide sufficient water for up to 10 butterfly sprinklers. For more sprinkler heads or when using deluge spray systems or impact drive sprinklers consult with the manufacturer or distributor to establish what size engine and pump is adequate to pressurise the system.

The pump should be housed in well ventilated shed or small insulated shelter in an easily accessible area on the protected side of the house (ie: on the side least likely to be threatened by fire). Make sure the pump can be operated by all members of the family (a key start ignition system is ideal) and that it is checked weekly during the fire danger season.

When deciding to turn on your sprinkler system allow enough time to wet down the area before the fire reaches your property and keep enough water available to continue operating the systems until well after the fire has passed. If you intend to install the sprinkler system yourself it is recommended that you seek advice from a plumber to ensure optimum performance from your system.

Further Information:

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