



**Fog Systems** have been used for decades as an economical and efficient means of environmental control through out the world. Fog system applications include outdoor cooling, humidification, dust and odor control, special effects and livestock cooling. In some cases, the fog will surround the area and in other cases, it will be a single line that runs down the center of the area.

### **What is a Fog System**

A fog system is defined as high pressure water that runs through a specialised fog nozzle which produces fine droplets that floats in air and evaporate. This also aids as filtering of the air when designed as a dust and odor control system and reduces temperature when designed as an outdoor cooling system. By definition, a fog system will require pressures of at least 70 bar (1000 psi) to be used to provide the micron sized droplets required to provide the desired results.

## **COOLING PRINCIPLES**

Evaporative cooling is responsible for the chill you feel when a breeze strikes your skin. The air evaporates the water on your skin, with your body heat providing the energy.

By forcing water, by means of a high pressure pump, through our specially designed misting nozzles, we create a fog of ultra fine water droplets with a average size of less than 10 microns.

These tiny water droplets quickly absorb the energy (heat) present in the environment and evaporate, becoming water vapor (gas). The energy (heat) used to change the water to a gas is eliminated from the environment, hence the air is cooled.

**Relative humidity** is the amount of moisture in the air compared to the amount of moisture the air could absorb at the same temperature, is a crucial factor in determining cooling potential. The lower the relative humidity, the more water can be vaporized and the more heat can be removed.

Evaporative Cooling can be used effectively in most geographical location. This is because when temperatures reach their peak during the day, humidity is normally at its lowest point.

**Fog cooling systems** have been in use around the world since the 1950s, starting in the livestock industry and then progressing into restaurant and residential use in the 1980s. With favorable results, the response was with immediate acceptance.

For residential and restaurant patio cooling, the fog system design requires the placement of a high pressure fog line around the perimeter of the area to be



cooled. As the fog evaporates, the temperature of the surrounding area is reduced. The fog system lines should be placed on the outer area of the patio at a height that will allow for complete evaporation. When properly designed and installed, the results can be dramatic.

All the water from the fog system will evaporate and the outside temperature will be reduced without the need for traditional air conditioning. Cooling fans can also be included if additional air circulation is required. The expected temperature drop will vary depending on climatic conditions, but cooling of up to 12°C is achievable under ideal circumstances.

## ***Frequently Asked Questions:***

### ***How does the system work?***

The fog cooling system uses very high water pressure at 70 bar or 1000 psi developed from a high quality pump and delivery lines to produce very fine, 10 micron sized droplets from specially designed nozzles. The fine droplets evaporate quickly and absorb the heat in the air. Fog or mist cooling systems use ~~fast~~ evaporation to provide excellent cooling or can add humidification or dust suppression in domestic, commercial and industrial applications.

### ***Where does the misting work best?***

The ideal conditions where evaporative cooling works best is when the temperature rises between 29°C to 46°C with low humidity levels. The effectiveness of the system with humidity between 40% and 90% is good, but below 40% the performance is excellent with a drop in temperature of around 12°C. In Australia, apart from the tropical areas, the humidity on a regular summer day is below 40% often around or below 10%.

### ***How much water does it use?***

Water usage depends on the system installed. Each nozzle uses between 2.5 to 6.5 litres per hour depending on size typically 4.72 LPHr or 0.08 lpm. A 10 nozzle kit will use around 47.2 LPHr which will do a small pergola area. A fan with a 5 nozzle ring will use around 23.5 LPHr.

### ***Will I get wet floors or surfaces?***

A properly install fog system will not cause any wetting of floors or surfaces when operated correctly. In factories or workshops adequate ventilation must be available otherwise humidity levels will rise and total evaporation won't happen. The ~~time~~ pump has a digital timer installed which allows the pump to cycle at a resettable time ON and time OFF to reduce the water usage and humidity.



For best results static mist lines should be installed around 3 metres above the floor and fans need around 3 to 4 metres horizontally to an object to operate correctly.

***Is there any maintenance required?***

The only maintenance required for a properly designed fog system is to change the oil in the pump after the first 50 hours and then every successive 500 hours. Clean the nozzles at the start of the season and as required. The water filter cartridges should be replaced yearly as a minimum, and a visual check of all fittings and hoses / tubing yearly. Drain the system of water at the end of the season and flush all lines without nozzles at the start of the season with fresh water.

***Will the fogging system fit onto my existing fans?***

Yes, in most cases the fan misting nozzle ring will fit your existing fan onto the front guard. Perhaps the location of your fans may need to be relocated for the best results. A pump, fittings, hose etc will need to be purchased to suit your requirements.

***How many fans can I run from my pump?***

This all depends on the pump size but a 1.5 lpm pump will operate 3 fans with a 5 nozzle ring and 0.2 sized nozzles, and a 2.5 lpm pump will 6 fans and a 4 lpm pump will operate 10 fans etc.

***Can I install the system myself?***

In most cases you can install a fog cooling DIY kit yourself, all the fittings are a push fit type and the pump installation is very simple. Only simple hand tools and a basic mechanical knowledge are required, a power point and a normal domestic water supply. Operation, installation and maintenance manuals are included with the DIY kits.