

## **Features And Benefits of the Unifire Water Misting System**

Unifire's patented water mist system combines ventilation and cooling into one simple operation. This system breaks down a droplet of water into 200 microns. There are several reasons for this particular size of droplet. Our system was designed with some specific principles in mind. The first is the Latent Heat of Vaporization, for every 100# of dry air; it will take 1.7 gallons of water a minute at 200 microns to cool a structure from 2000 degrees Fahrenheit to 200 degrees Fahrenheit. This is a very small amount of water but is broken down to a droplet size that has a 97% heat exchange at 70 degrees Fahrenheit. This prevents steaming and thermal imbalance and also allows the droplet to be carried within the air stream, and throughout the structure. The second principle is Wind Chill. The more airflow or the faster the airflow, the cooler the air becomes. The air movement aids in evaporation and cooling. In addition, the airflow keeps the heat moving forward away from the advancing fire personnel. Since hot air is naturally drawn to cold air, the cooler the air stream is, the faster it will eliminate the heat, smoke and particles of combustion.

Unifire's water mist system has been proven to create a heavier concentration of airflow. This provides a quicker pressurization and faster removal of heat, smoke and toxic gases. The particles of combustion adhere to the water mist and therefore, are pushed out of the structure faster.

The following is a list of benefits that our Water Mist System provides:

1. Minimizes use of water (less cleanup and water damage).
2. More rapid cooling of structure
3. Allows faster pressurization (cool dense air hitting hot dry air)
4. Removes gases, toxic chemicals and soot
5. Provides safer cleanup operations
6. Reduces fuel temperature
7. Inhibits flame expansion.
8. Assists in location hot spots.
9. Helps cool fire personnel
10. Cools certain chemicals, gases and hazardous materials to safe levels
11. Keeps flashover potential to a minimum

The water mist attachment requires a hose line capable of delivering a minimum of 40 pounds per square inch of pressure and a maximum of 240 pounds per square inch. The water flow must be a minimum of 6 gpm for sufficient cooling effects and operation. The individual nozzles have a pre-filter screen that is hand tight and requires occasional cleaning if water atomization is not fully achieved. Remove the head of the nozzle and flush with clean water until the screen is free of debris.

The lower nozzle is rated at 3.6 GPM @ 120 psi, the upper nozzle is rated @ 1.7 GPM @120psi. The reason for the two different sizes of nozzles is to keep the water suspended in the airflow.

Expected outside air temperature drop can be as much as 26 degrees inside temperatures have been recorded up to 2700 degrees drop depending on the circumstances.

**How heat can affect your workers**

Effective Temperature	75	80	85	90	95	100	105
Loss in work output	3%	8%	18%	29%	45%	62%	79%
Loss in Accuracy		5%	40%	300%	700%	-	

**How it works anywhere!**

Many mistakenly believe they live in a place that is too humid and hot for a Unifire PPV with water-mist system to be effective. But the laws of physics dictate that as the temperature rises, relative humidity falls.

A review of weather data from hot weather regions shows that even in the most humid climates, midday relative humidity levels are well within the range where Unifire's mist system can provide heat relief. Humidity levels may start the day in the 90% range during the cool morning hours, but at 90°F and above, it's almost impossible to have humidity levels above 70%.

City, State	Relative Humidity %	Unifire Temp drop at 95° F
Baton Rouge, LA	Upper 50's	12° F
St. Louis, MO	Lower 50's	16° F
Phoenix, AZ	Upper 10's	25° F
Philadelphia, PA	Mid 50's	14° F
Orlando, FL	Upper 50's	12° F

Air Temp	Temp Drop at 40% RH	Temp Drop at 50% RH	Temp Drop at 60% RH
80° F	18° F	14° F	11° F
85° F	19° F	16° F	11° F
90° F	20° F	15° F	11° F
95° F	21° F	16° F	12° F
100° F	19° F	16° F	11° F