



Sprinkler / Water Mist Performance Characteristics Comparison Chart

SYSTEM TYPE	Item 1 Reactive Surface Area Per 1ltr Water	Item 2 Visibility During Operation	Item 3 Operating Temp Of Auto Nozzles	Item 4 Operating Sensitivity / Speed (R.T.I)	Item 5 Droplet Size Microns	Item 6 Droplet Velocity	Item 7 Installation Height Restriction	Item 8 Void Coverage	Item 9 Water Usage Average Per Head LPM	Item 10 Run Time From Water Storage	Item 11 Dual Systems Life Safety Support	Item 12 Head Spacing Up To 5m	Item 13 System Design Objective	Item 14 Smoke Control (Scrubbing)	Item 15 Use on various types of fire i.e. liquid fat	Item 16 Assumed Maximum Area Of Operation
Life Safety Sprinklers BS EN 12845	2m ²	Good	57-68°C	Fast Response 3mm Bulbs 50	1000	Gravity	No	Yes	80-120 LPM	60 Minutes 30 Minutes for School TB 221	Yes	3-4m	Fire Control	Poor	No	As Standard
Residential & Domestic Sprinklers BS9251	2m ²	Good	57-68°C	Fast Response 3mm Bulbs 50	1000	Gravity	Yes 22m	Yes	60 LPM	10 min Domestic 30min Residential	No Single Pump	3-4m	Fire Control	Poor	No	As Standard
AMF Systems Low Pressure Water Mist System	2500m ²	Good	57-68°C	Extra Fast Response 2.5mm Bulbs 18.9	70-120	10 m/s	No	Yes	8-22 LPM	10 min Domestic 30 min Residential 60 min Commercial 90 min High Hazard	Yes	3m	Fire Suppression Extinguishment	Good	Yes	As per BSEN 1284 or BS 9251 Dependant on Risk
High Pressure Fog Systems	3000-6000m ²	Poor	57-68°C	Extra Fast Response 2.5mm Bulbs 18.9	20	>20 m/s	No	?	8 LPM	30 Minutes	Yes	2-3m	Fire Suppression Extinguishment	Very Good	Yes	?

Comments/Explanation of Items 1 to 16

<p>Item 1. Reactive Surface Area Per litre of Water.</p> <p>The reactive surface area is the total surface area of the water droplets released from the operating nozzle. It should be noted the greater the surface area the more energy is absorbed from the fire thus suppressing the fire, as the energy is absorbed from the fire into the water droplets, the droplets reach a point at which they become saturated with heat and flash to steam at an expansion ratio of 1:1640, steam is an inert gas and suffocates the atmosphere directly around the fire plume again effecting suppression.</p>	<p>Item 5. Droplet size</p> <p>Self Explanatory, however this is directly linked to the reactive surface area of each system. Halving the size of the droplet increases the surface area by a factor of 8, it should also be noted that due to the smaller droplet sizes, more droplets are generated which in turn prevent/block attenuated heat from the fire source preventing the ignition of other combustible sources</p>	<p>Item 9. Water usage per head</p> <p>As can be seen from the above chart, water mist systems use considerably less water than that of sprinkler systems, in applying water in a more efficient manner (Item 1) less water is used but a greater level of suppression is achieved. i.e. Not how much water is applied but how you apply it.</p>	<p>Item 12. Head spacing up to 5m high</p> <p>Self Explanatory</p>
<p>Item 2. Visibility during operation</p> <p>It should be noted that AMF Systems low pressure water mist system affords the same visibility in a fire situation to that of sprinklers, and should not be confused with high pressure fogging systems which substantially reduce visibility</p>	<p>Item 6. Droplet velocity</p> <p>Droplets released from nozzles in the AMFS systems are not obstructed by a deflector plate, that is evident in sprinklers thus water mist fired under velocity at 10 m/s to the fire plume.</p>	<p>Item 10. Run Time from water storage</p> <p>It has been perceived that water mist systems only operate for 3 or 4 minutes which is not true, carrying out the system design in accordance with the hazard classifications of the prevailing sprinkler standards, AMF Systems low pressure water mist system will afford fire protection to with 10, 30, 60 or even 90 minutes. All AMFS systems are fully hydraulically calculated utilising industry standard software via the Darcy Weisbach method to ensure the AMAO (Assumed Maximum Area of Operation) is satisfied for the prescribed period i.e. 216m² for 60 minutes under OHIII protection.</p>	<p>Item 13. System design objective</p> <p>It is commonly assumed that sprinkler systems are designed to extinguish fires, sprinkler systems are designed to control a fire and hold it to its seat of ignition. Water mist systems are designed to at worst suppress and at best to extinguish.</p>
<p>Item 3. Operating Temp of automatic nozzle</p> <p>The operating temperature of automatic nozzles are to be set at no less than 30°C above the highest anticipated ambient temperature</p>	<p>Item 7. Installation height restriction</p> <p>It is considered that high level areas cannot be protected effectively due to the heights involved, while this is true for high pressure systems it is not true for low pressure systems. The un-obstructed nozzles (i.e. No deflector) release water droplets at a rate of 10 m/s and with their larger mass (compared to high pressure droplets) effectively deliver suppression to low level fires.</p>	<p>Item 11. Dual Systems life safety support</p> <p>All AMF Systems low pressure water pumped systems are provided with a minimum of 2 pumps (duty & standby), this is above and beyond that of some sprinkler systems i.e. BS 9251 (which is advocated as a life safety system however allowed to operate with only a duty pump) and commercial sprinkler system to schools, which under Technical bulletin 221 allow for only one pump and a 50% reduction in the water storage tank bringing the minimum penetrating time from 60 minutes to only 30 minutes.</p>	<p>Item 14. Smoke control (Scrubbing)</p> <p>Various studies have shown that water mist systems do provide a degree of smoke scrubbing, a cleansing/whitening of the smoke, whilst sprinklers are known to push the smoke layer to low level</p>
<p>Item 4. Operating Sensitivity of nozzles.</p> <p>As can be seen from the above chart AMF Systems low pressure water mist nozzles are equipped with thermal sensitive bulbs (glass pial) which have a Relative Time Index (R.T.I.) of 18.9. This enables the nozzles to detect and actuate in a fire situation up to 2.5 times faster than a life safety sprinkler head which has an RTI of 50.</p>	<p>Item 8. Void Coverage</p> <p>Self explanatory, The low pressure water mist system provides nozzles that expel water mist droplets in a 'flat oval' spray pattern, i.e. Water is distributed horizontally though the void rather than vertically like a sprinkler system, applying water on and in front of the fire in all directions simultaneously</p>		<p>Item 15. Use on various types of fires</p> <p>Water mist systems are effective at suppressing oil/fuel fires. The droplets sizes are small enough that they do not penetrate the surface of the oil and sit on the surface absorbing energy from the fire before flashing to steam creating an inert atmosphere around the fore plume. Sprinkler droplets are heavy enough to penetrate the surface of the oil and remain a liquid whilst immersed in the oil, all the time absorbing energy, when the water becomes saturated with energy the water flashes to steam inside the oil, the rapid expansion inside the oil causes expansion of the fuel and of course the fire plume.</p>
			<p>Item 16. Assumed Maximum Area of Operation</p> <p>Self Explanatory</p>

Sprinkler / Water Mist Fire Testing Comparison Chart

Hazard Classification	LP2000 Low Pressure	BSEN12845 Sprinklers	BS9251 Sprinklers
OH I	IMO A800 (19) Cabins & Corridors	NO	N/A
OH II	IMO A800 (19) Open Public Space Corner Public Space	NO	N/A
OH III	IMO A800 (19) Open Public Space Corner Public Space Storeroom test	NO	N/A
OH IV	IMO A800 (19) Open Public Space Corner Public Space	NO	N/A
HHP4	Warrington Cat 4 Fire Tests	N/A	N/A
Resi & Domestic	IMO A800 (19) i.e. UL 1626	NO	UL 1626

Note: Open public space & corner public spaces tests were carried out in a test hall of 586m² ventilated and non ventilated, at 2.5m and 5.0m ceiling heights