### Sprinkler / Water Mist Performance Characteristics Comparison Chart

<table>
<thead>
<tr>
<th>SYSTEM TYPE</th>
<th>Reactive Surface Area Per 1 litre of Water</th>
<th>Void Coverage</th>
<th>Water Usage Average per Head LPM</th>
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<th>Dual Systems life safety support</th>
<th>Head Spacing Upto 5m</th>
<th>System Design, Objective</th>
<th>Smoke Control (Scrubbing)</th>
<th>Use on various types of fire is liquid fuel</th>
<th>Assumed Maximum Area of Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life Safety Sprinklers - BS EN 12845</td>
<td>2m² Good 57-68ºc</td>
<td>Fast Response 3mm Bulbs 50 1000</td>
<td>2.5mm Bulbs 18.9</td>
<td>Yes</td>
<td>No</td>
<td>80-120 60 minutes or 30 minutes for school TB221</td>
<td>Yes</td>
<td>3-4m</td>
<td>Fire Control</td>
<td>Poor</td>
<td>No</td>
</tr>
<tr>
<td>Residential &amp; Domestic - BS9251</td>
<td>2m² Good 57-68ºc</td>
<td>Fast Response 3mm Bulbs 50 1000</td>
<td>2.5mm Bulbs 18.9</td>
<td>Yes</td>
<td>Yes 22m</td>
<td>60 10 min Domestic - 30 min Residential</td>
<td>No - Single Pump</td>
<td>3-4m</td>
<td>Fire Control</td>
<td>Poor</td>
<td>No</td>
</tr>
<tr>
<td>Elan FPS Systems Low Pressure Water Mist Systems</td>
<td>2500m² Good 57-68ºc</td>
<td>Extra Fast Response 2.5mm Bulbs 18.9 70-120 10 m/s</td>
<td>No</td>
<td>Yes</td>
<td>8 to 22 10 min Domestic - 30 min Residential - 60 min Commercial - 90 min High Hazard</td>
<td>Yes</td>
<td>3m</td>
<td>Fire Suppression - Extinguishment</td>
<td>Good</td>
<td>Yes</td>
<td>As per BS 1284 or BS9251 dependant on risk</td>
</tr>
<tr>
<td>High Pressure Fog Systems</td>
<td>3900-6000m² Poor 57-68ºc</td>
<td>Extra Fast Response 2.5mm Bulbs 18.9 20 &gt;20 m/s</td>
<td>No</td>
<td>Yes</td>
<td>8</td>
<td>30 Minutes</td>
<td>Yes</td>
<td>2-3m</td>
<td>Fire Suppression - Extinguishment</td>
<td>Very Good</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Further details of Items 1 to 16

**Item 1. Reactive Surface Area Per litre of Water.**

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 1:1660, steam is an inert gas and suffocates the atmosphere directly around the fire plume again effecting suppression.

**Item 2. Visibility during operation.**

It should be noted that Elan FP Systems low pressure water mist systems offer the same visibility in a fire situation as that of sprinklers, and should not be confused with high pressure fogging systems which substantially reduce visibility.

**Item 3. Operating Temp of automatic nozzle.**

The operating temperature of automatic nozzles are to be set no less than 30ºC above the highest anticipated ambient temperature.

**Item 4. Operating Sensitivity of nozzles.**

As can be seen from the above chart Elan FP Systems low pressure water mist nozzles are equipped with thermal sensitive bulbs (glass phial) 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 R.T.I of 50.

**Item 5. Droplet size.**

As detailed in the above chart, 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.

**Item 6. Droplet velocity.**

Droplets released from nozzles in the Elan FP 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.

**Item 7. Installation height restriction.**

It is considered that high level areas cannot be protected effectively by sprinkler systems based on BS 9251 single pump operation and commercial sprinkler system to schools. Under Technical bulletin 221 allows for only one pump and a 50% reduction in the water storage tank bringing the minimum operating time from 60 minutes to only 30 minutes.

**Item 8. Void Coverage.**

The LP2000 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.

**Item 9. Water usage per head.**

As detailed in the above chart, water mist systems use considerably less water than that of sprinkler systems. 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.

**Item 10. Run Time from water storage.**

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, Elan FP Systems low pressure water mist system will afford fire protection to with 10, 30, 60 or even 90 minutes. All Elan FP systems are hydraulically calculated utilising industry standard software via the Darcy Wsibauch method to ensure the AMASS Maximum Area of Operation) is satisfied for the prescribed period i.e. 216m² for 60 minutes under OH III protection.

**Item 11. Dual Systems life safety support.**

All Elan FP low pressure water pumped systems are provided with a minimum of 2 pumps being duty & standby. This is above and beyond that of some sprinkler systems based on BS 9251 single pump operation and commercial sprinkler system to schools. Under Technical bulletin 221 allows for only one pump and a 50% reduction in the water storage tank bringing the minimum operating time from 60 minutes to only 30 minutes.

**Item 12. Head spacing up to 5m high.**

As detailed in the above chart.

**Item 13. System design objective.**

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 at worst suppress and at best to extinguish.

**Item 14. Smoke control (Scrubbing).**

Various studies have shown that water mist systems do provide a degree of smoke scrubbing which is a cleansing/whitening effect on the smoke., whilst sprinklers are known to push the smoke layers to lower levels.

**Item 15. Use on various types of fires.**

Water mist systems are effective at suppressing oil/fuel fires. The droplet 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 fire 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.

**Item 16. Assumed Maximum Area of Operation.**

As detailed in the above chart.