ImacoFire Co.

Fire Fighting Equipment

WATER MIST SYSTEM

Applications

Water mist fire protection systems have been installed in thousands of private and public facilities throughout the world. Typical applications for water mist systems include the following:

- *Aircraft Hangars*
- *Combustion & Gas Turbines*
- *Computer Rooms*
- *Electric Cable Tunnels*
- *Electric Switch Gear Rooms*
- *Electric Transformers substations*
- *Escalator Rooms & Rail Sub-Stations*
- *Fat Fryers*
- *Hotels/Motels & Old Age Hostels*
- *Local Applications for passenger ships*
- *Warehouses*
- *Machinery Spaces, Engine Rooms & Cargo Pump Rooms on passenger vessels*
- *Military & Naval Applications*
- *Museums, Historical Buildings, Archives & Libraries*
- *Offices & High Rise Buildings*
- *Off-shore & On-Shore Drilling Platforms*
- *Private Residences*
- *Railway Locomotives & Carriages*
- *Restaurants*
- *Total Flooding Systems on land*

Description

A. Water mist is defined by NFPA 750 as a water mist spray for which the dv0.99 for the flow–weighted cumulative volumetric distribution of water droplets is less than 1,000 microns at the minimum design operating pressure of the water mist nozzle.

B. Water Mist is divided into three categories:

1. **Low Pressure** – where the distribution piping is exposed to pressure of 175 psi (12.1 bar) or less.
2. **Intermediate Pressure** – where the distribution piping is exposed to pressures greater than 175 psi (12.1 bar) but less than 500 psi (34.5 bar).
3. **High Pressure** – where the distribution system piping is exposed to pressure of 500 psi (34.5 bar) or greater.

C. The water mist distribution system is divided into two categories:

1. **Single Fluid System** – a water mist system utilizing a single piping system to supply each nozzle.
2. **Twin Fluid System** – a water mist system in which water and atomizing media are separately supplied to and mixed at the water mist nozzle.

D. Water mist is divided into three categories for system applications:

1. **Local Application Systems** are designed and installed to provide complete distribution of mist around the hazard or object to be protected. The system shall be designed to protect an object or hazard in an enclosed, unenclosed, or open outdoor condition. The system shall be actuated by automatic nozzles or by an independent detection system.
2. **Total Compartment Application Systems** are designed and installed to provide complete protection of an enclosure or space. The complete protection of an enclosure or space shall be achieved by the simultaneous operation of all nozzles in the space by manual or automatic means.
3. **Zoned Application Systems** are a subset of the compartment system and are designed to protect a predetermined portion of the compartment by the activation of a selected group of nozzles.

IMACOFIRE High Pressure Characteristics

- Small diameter pipe down to 9mm bore
- Small nozzle fittings 3/8”
- Stainless steel pipe & fittings
- Flow rates per nozzle as low as 3.4 LPM to 22LPM
- Fog-like distribution achieves entrainment in recessed areas
- Minimal water quantity
- Long retention (no need for room sealing)
- Versatility of design (flow quantities, system types, location of water tank)
- **High-Pressure > 35 bars**
- IMACOFIRE High Pressure water mist system is a 100-120 bar system
- Mist generated by water flowing through small orifices
- Droplet size 1 to 100 microns (average 50 microns)

IMACOFIRE High Pressure Pump Systems

IMACOFIRE pump systems comprise either electric high-pressure reciprocating piston pump(s) or diesel high-pressure reciprocating piston pumps. Pneumatic driven pumps are also possible upon request.

High-pressure piston pumps are connected to the water supply and to the stainless steel distribution pipe network that contains the water mist nozzles. Pumped systems are supplied with state-of-the art PLC pump controllers and a local water mist control panel having automatic and local manual start/stop features. Fire pump skids are supplied complete with all accessories such as pump unloaded valves, S/Steel pressure gauges, pressure switches, ammeters, electric (or diesel) motors, high pressure basket inline water filters, non-return valves, manual isolation ball valves, 24VDC section valves, Y-strainers etc. all mounted onto a heavy duty Galvanized steel frame with eye lifting lugs and anti-vibration mounts. Pump cabinets are IP65 NEMA-4X rated and can be supplied as explosion proof versions for specific hazards.

Diesel fire pump sets are also supplied with the above accessories including over-speed regulators, batteries and leads, ammeters, local auto start/stop panel, fuel tank, radiators (or cooling loops) for engine cooling, starter motor, drive shafts with safety guards and exhaust manifold.

Comparison between Water mist System and Other Technologies

Activity/Features	Sprinkler	Halon	CO2	water mist
Non-Toxic	YES	NO	NO	YES
Extinguish Class A&B Fires	NO	YES	Yes	yes
Environmental Safe	YES	NO	NO	YES
Requiring Fire Pump	YES	NO	NO	YES
Light Weight	NO	YES	NO	YES
Service Accessibility	YES	YES	YES	YES
High Heat Absorption	YES	NO	NO	YES
Cost Effectiveness	NO	NO	NO	YES
Running Time (in-built safety)	N/A	NO	NO	YES
Evacuation Plan Requirement	NO	YES	YES	NO
Service & Refill Cost Effectiveness	N/A	NO	NO	YES

In a controlled demonstration, one water mist nozzle discharged around 380 liters (100 gallons) of water in 30 minutes.

A traditional sprinkler system, in turn, discharged some 3,600 liters (951 gallons) from a single nozzle within the same time period.

Nozzle and adaptor connection

Recommended high pressure pipe:
Seamless stainless steel pipe according to standard ASTM 269 TP 316L / DIN2391– C.
12 × 1.5 mm
Working pressure: 381 bar / 5525 psi
Burst pressure: 1514 bar / 21950 psi

Recommended fittings:
Stainless steel twin ferrule compression Ring fittings.

Recommended tight gel:
Tight gel must be used between the nozzle and the adaptor.
IMACOFIRE recommends Loctite 542 hydraulic thread tight gel.
To prevent particles from entering into the system and clogging the nozzles the following procedure must be followed:
• Deburr and clean pipes and fittings prior to the installation.
• Flush the system with water after assembling and before the nozzles are mounted.