# Water Mist System

## GENERAL INTRODUCTION:

The concept of using water in the Fire Protection system is very old. However concept of using pressurized water in the mist form is the new technology which is currently getting more importance due to many unique advantages.

## GENERAL TECHNICAL REVIEW:

Water mist systems are fire extinguishing systems using water as minute particles commonly referred as mist. Water mist systems are basically classified into three namely, **Low pressure <12.1bar, Intermediate pressure 12.1<34.5 bar, High Pressure >34.5bar water mist system.**

Water mist system extinguishing capability depends on the important design parameters such as heat extraction mechanism, oxygen displacement near the vicinity of fire forming a blanket of water vapor around the fire source, penetration of water particles through the flame & dilution of the oxygen-fuel rich air.

**Water mist system is the suitable solution where,**

**(a) Availability of water is a constrain**

**(b) Water damage will lead to other huge loss**

**(c) Unviable or unsuitable for other fire extinguishing and suppression system**

***Reason for choosing Engineered Cylinder based Water mist system.***

For water mist system fuel type and area will be the leading factor to design the system. However fire suppression capabilities is depending on,

(i) spray density (ii) Drop let size (iii) spray velocity (Kinetic energy)

It is a myth that very low micron say (50 microns) water particle will effectively extinguish the fire. In fact, spray density and spray velocity play the major role. As per NFPA (National Fire Protection Association) 750 - 2015 Ref A.3.3.22 Water mist Smaller than 400 microns droplets are suitable to extinguish class B fire Above 400 micron upto 1000 micron are suitable to extinguish class A fire.

In gas suppression system, actual discharge will take place within 10-60 second from time of

actuation of releasing device. Where as in water mist system actual discharge of mist will take place in some cases even after 3-5 minute after releasing device is operated. This delay is caused because pressurizing entire pipe network to design pressure of the mist nozzle needs some time. This is the main limitation of pump based system. To avoid this, pre-pressurized pipe network is used. This will lead to continuous monitoring & maintenance work.

High pressure system is always associated with high cost equipment and maintenance. 100-120 bar Mist system required specialized pumping equipments and distribution piping. Cylinder based engineered low/intermediate/high pressure water mist system which operates between 12 to 60 bar pressure is suitable solution to various limitation and parameters as discussed above.

**TECHNICAL DESCRIPTION :**

**bala-wa-mist IH955 series.. Engineered cylinder based Water Mist Fire Suppression System** are usually designed based on the type of hazard, size of area are to be protected. Fire Suppression System is used to quench the Fire by reducing the essential requirement of Fire to sustain, basically Heat and Oxygen.

**bala-wa-mist IH955 series Engineered cylinder based Water Mist system** is specially designed to meet the Fire Suppression requirement of Smaller or larger areas.

**OPERATION PHILOSOPHY:**

The system can be operated by any one of the following methods:

- **Automatic Detection & Automatic Extinguishing**
- **Manual Detection and Manual Discharge with Emergency push buttons through control panel.**
- **Mechanical Manual Discharge by operating Manual lever.**

**Automatic Detection and & Automatic Extinguishing:**

On the receipt of the fire signal from the detectors, the control panel provides 24VDC supply to Solenoid coil of IH955 Skid. A pressure switch feedback can be taken to panel for confirmation.

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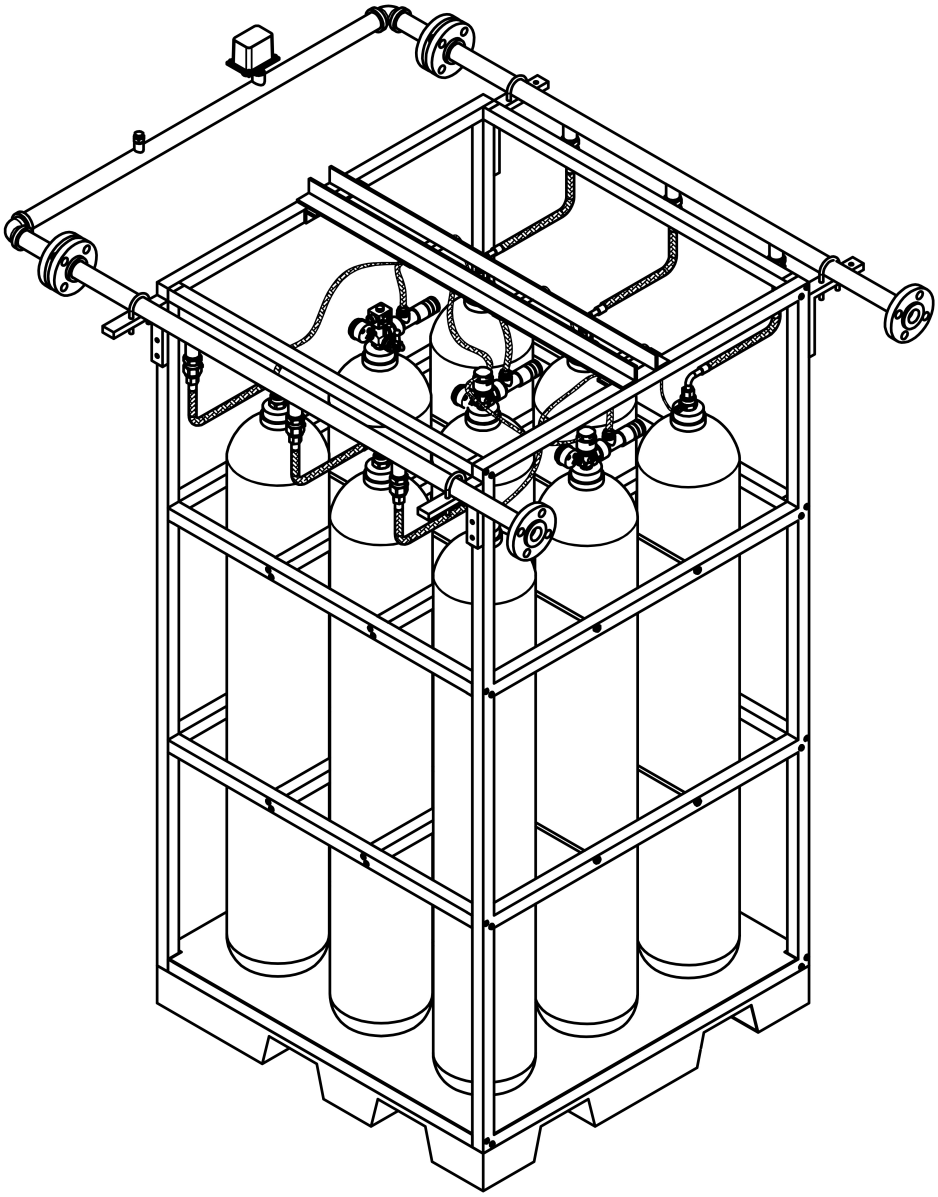
**Manual Detection & Manual Discharge through the Emergency Push Buttons:**

When the push buttons are pressed, the fire signal is given to the control panel which provides 24VDC supply to Solenoid coil of IH955 Skid. A pressure switch feedback can be taken to panel for confirmation.

**Mechanical Manual Discharge by operating Manual lever:**

The IH955 Skid can be operated manually by pulling down the manual lever in the skid.



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## FEATURES OF IH955 SKID:

- Occupy only 1.2m x 1.2m area
- Store 450L of water in 1.5 $m^2$ area
- Suitable for Class A, Class B and Class C fire
- Operating pressure -

  below 8-12 bar for Low pressure system,

  15 - 30 bar for Intermediate pressure system,

  40-60 bar for High pressure system.
- Can cover an area of 40 to 50 sqm
- Can discharge Water Mist for 10 minutes
- Different nozzle available for class A, class B and Class C fires
- Can be easily scaled up by just adding additional skids for larger areas
- For larger risk areas , different skids can be placed for piping and storage advantage
- No need of Ground water, Pumps or Diesel Engine.
- Skid can be operated by 24 VDC or by manually without any electrical connection.
- When used with fire detection tube, the skid can be operated automatically without any electrical power. (useful in tunnels, underground cable cellars)

## RECOMMENDED RISK AREA:

### IH955 Series..

- Warehouses
- Underground rooms
- Tunnels
- Cable cellars
- Remote location Transformers / Rooms
- Existing buildings which require the egress means to be protected
- Engine Test Bed
- Machineries

# Water Mist System

## ENVIRONMENTAL FACTS:

Unlike other chemical agents used in the Fire Suppression /Extinguishing systems water is not having any threat of ODP (Ozone Depletion Potential) and GWP (Global Warming Potential). The system needs potable water which is readily available.

## HUMAN SAFETY:

Water Mist extinguishes the Fire by absorbing the heat and reducing the Oxygen content from 16% to 8% by volume in the immediate vicinity of the Fire Source. Whereas, the normal oxygen content is maintained approximately 20% to 21% in the rest of the room. Mist washes out flue gases. Water Mist is an ideal choice for areas where people are present.

## USER FRIENDLY:

It is very user friendly because there is no threat of high refilling cost in the event of false discharge of costly chemical gases like FK5112/HFCEA. No need for desperate inconclusive debate by Fire & Safety professional on purity/genuinity of costly chemical gases filled in the cylinders. No critical design is required to maintain NOAEL/LOAEL levels. No room integrity test is required as in the case of gas extinguishing system.

## STANDARDS FOLLOWED:

I. **IS 15519 – Water mist fire protection systems – system design, installation and commissioning – code of practice.**

II. **NFPA 750 – Standard on water mist fire protection systems.**