



# Piian High Pressure Dust Suppression Systems

## Flexi~Fog System

### An Industrial Quality Fogging System for Dust Suppression of:

- Garbage Transfer Stations
- Demolition Waste Transfer Stations.
- Material Recovery Facilities.
- Crushing / Screening
- Grinding / Waste Reduction.
- Loadouts and Material Transfer.

The Piian Flexi~Fog System has been specifically developed to suppress dust inside large buildings and to suppress dust caused by conveying, sorting, screening and crushing equipment.

In the past, atomization technology for process dust suppression has been available in two "types": Small, low cost, low pressure sprayers that cause a lot of wetting and more expensive custom-built systems high pressure fog systems which are difficult to design and install. The Piian Flexi~Fog System includes the capabilities of large non wetting low water consumption high pressure atomization systems but is supplied as a kit that permits flexible and rapid installation without any design costs.

The Piian Flexi~Fog System pumps ordinary water at 1000PSI / 70 BAR pressure through a manifold tube, where it is released through highly specialized low flow atomization nozzles to form a mist of 10 micron sized droplets. The droplets are so fine they remain suspended in the air this not only eliminates wetting or dripping, but it provides an extremely efficient system for moisturizing and

containing fugitive dust.

The Piian Flexi~Fog System is comes in a simple self-install kit. The kit includes a 1000PSI / 70 BAR pump module, a coil of manifold tubing, between 10 and 500 nozzles and all necessary fittings. Few tools are required for assembly; simply cut the manifold tube to the required length and "press-on" fittings are used to install the nozzles. No major pre-design is required, no pre-fabrication is required, the nozzle layout can be decided and adjusted during the installation. The pump module requires an electrical connection and water connection.

The system is installed with the nozzles positioned to form a barrier or curtain of atomized water droplets around the source of dust in process operations. Dust created by transfer, crushing, and sorting operations is contained and its moisture content increased by the atomized water whereby usually is returned to the process material.



### Typical Fugitive Dust Solutions

Traditional fugitive dust solutions are very expensive. Installation of a baghouse or a dust collection system typically requires major plant modifications; operation costs are high with associated disposal and service costs.

Low pressure water spray system are a less expensive alternative but consume excessive amounts of water and wet the process material effectively solving one problem but creating another.

Chemical additive systems can only be used when alteration of the process material characteristics is not a problem, however chemical consumption costs often make the operation of the system unreasonable.



### Flexi Fog System Advantages

The Piian Flexi Fog System effectively solves the problems of standard spray systems and offers an effective solution where dust extraction technology is cost prohibitive.

The fog system operating at 1000PSI / 70 BAR atomizes water into very fine 10-micron water droplets. The system is installed to form a fugitive dust barrier or to envelop a structure with atomized water.

Fugitive dust blends and attaches to the atomized water droplets increasing the overall cohesiveness of the dust particle. At belt drop points or screening operations, the dust particles are returned to the processed material, in dusty environments, the airborne dust is knocked down.

### Special Features:

- Does Not Wet the Process Material
- No Wetting or Dripping
- 1000PSI / 70 BAR Operation
- 10 Micron Sized Droplets
- Fast Installation
- Supplied as a simple self install kit
- Uses "Push-On" or "Compression" Style Nozzles
- An exact pre - design is not necessary; kit includes enough nozzles and fittings to install the system several ways.
- Fittings and nozzles may be added or removed as you like.

### Uses Atomized Water to Suppress Dust

The flow rate of each nozzle is as low as 0.022 GPM / 0.095 LPM, the nozzles produce extremely fine 10 micron sized droplets. The system actually wets just the dust; it does not significantly raise the moisture content of the process material meaning no wetting, clogging or groundwater problems.

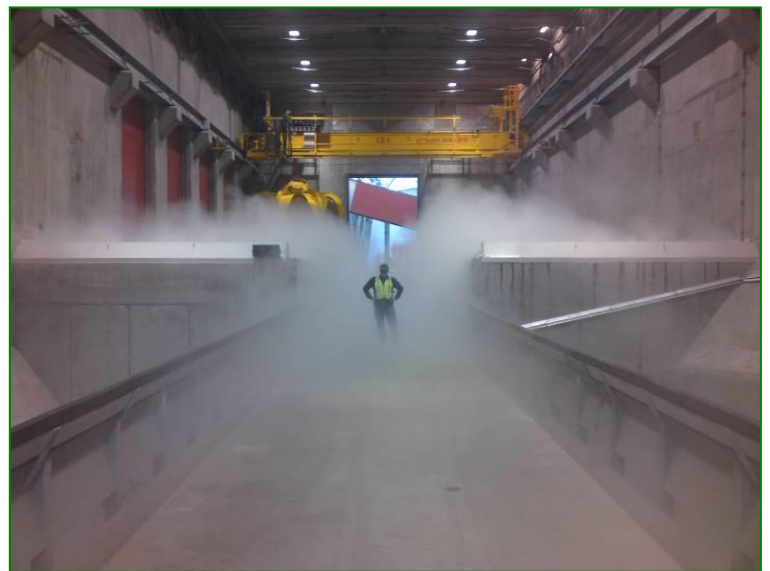
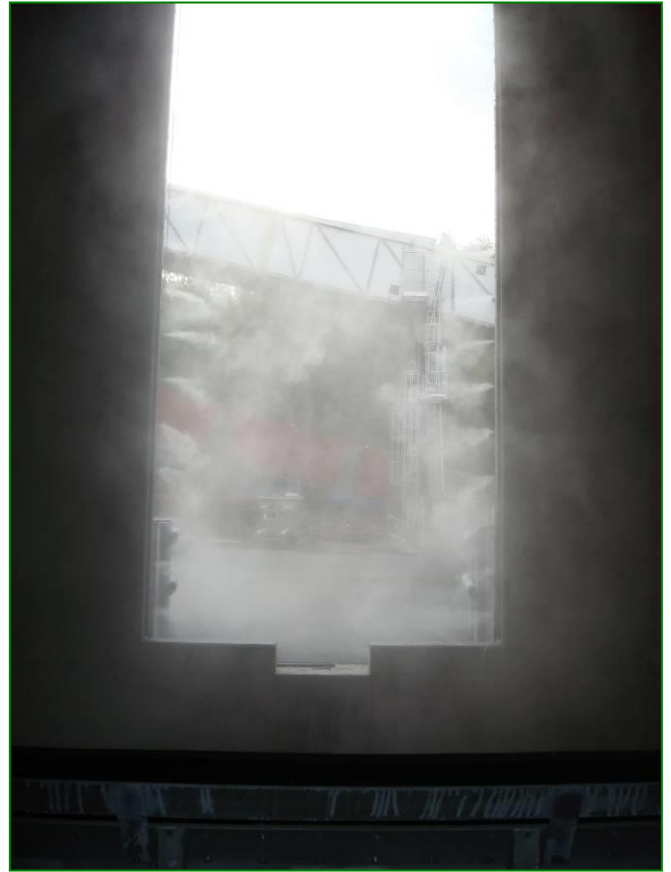
### Three reasons why the Piian Flexi~Fog System is the best solution to your process dust problems:

1. Performance – Operating at 1000PSI / 70 BAR, the system produces 10 micron sized droplets that wets just the dust without wetting the process material or causing any wetting or dripping.
2. Quality – The system includes proven industrial quality components that will provide years of trouble free operation.
3. Cost – As the system is packaged as a kit for you to install, we have no design costs, which provides tremendous savings to you.

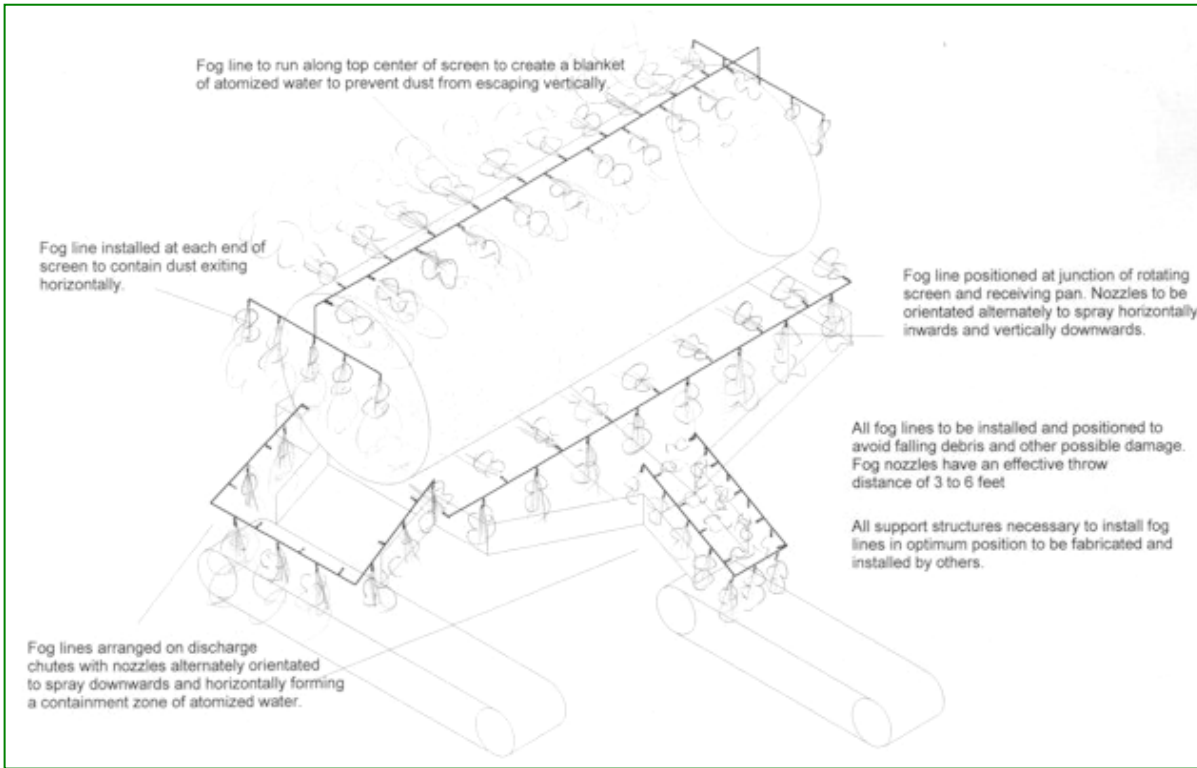


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## Flexi~Fog System

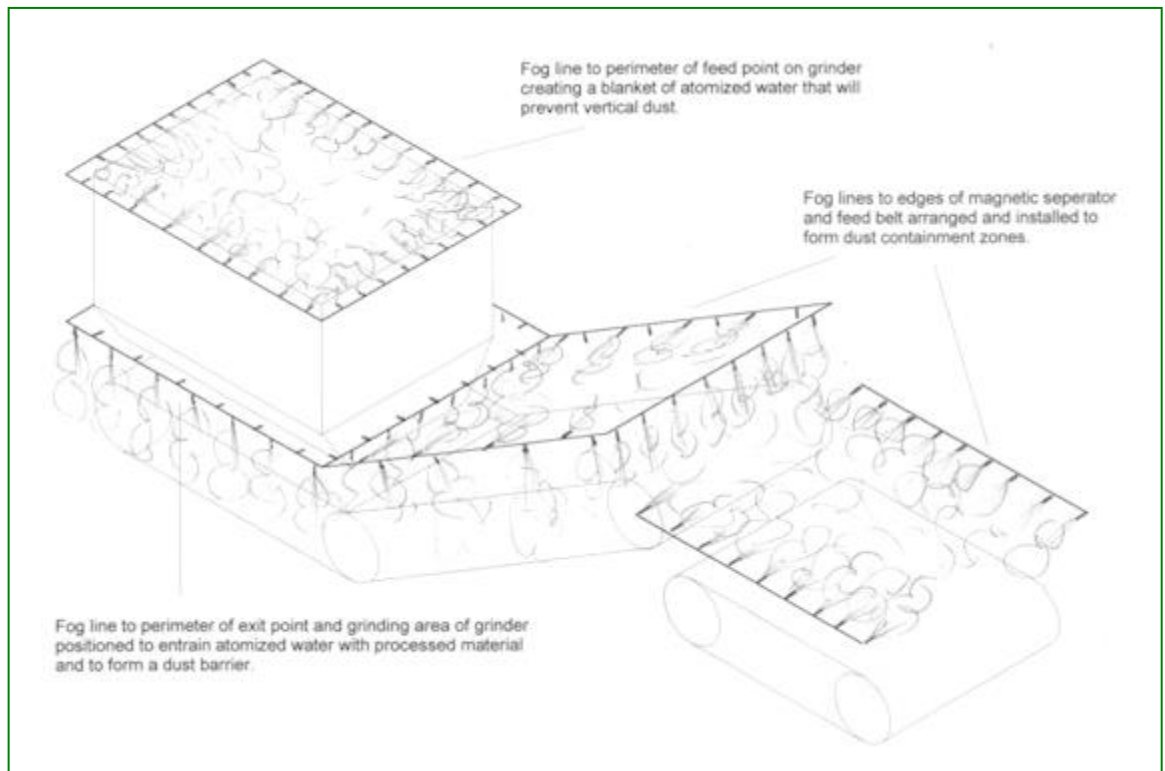


## Flexi~Fog System ~ Layout and Design Factors



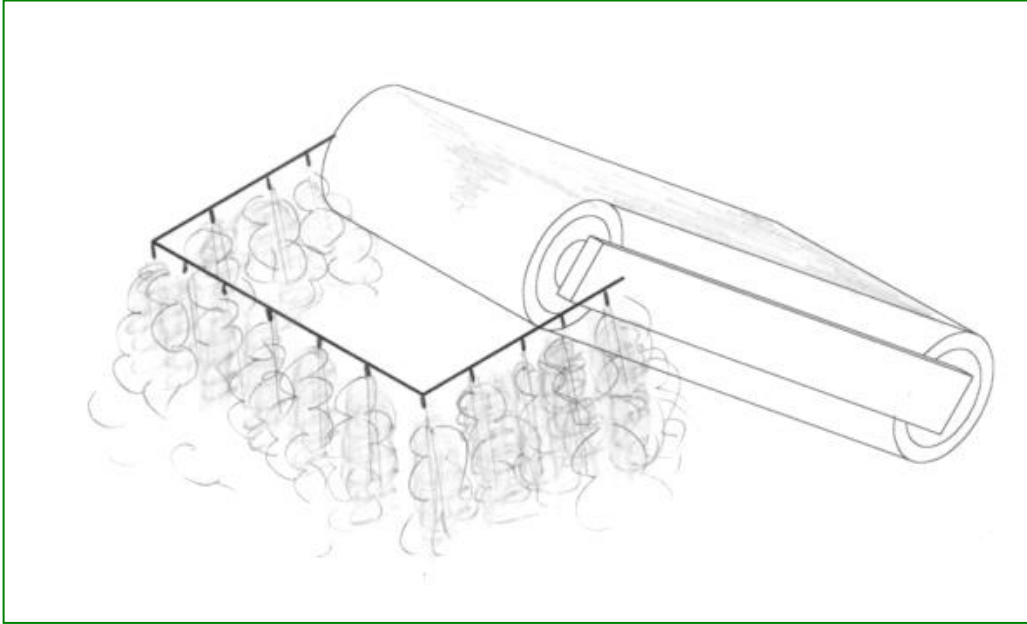
Complex processing machinery can be retrofitted as shown. The droplets produced by the system are very fine; there is no wetting of the process material to cause clogging problems.

The Flexi~Fog system can be designed to operate in very aggressive environments. The flexible and adaptive features of the system permit rapid and simple installation on complex equipment.





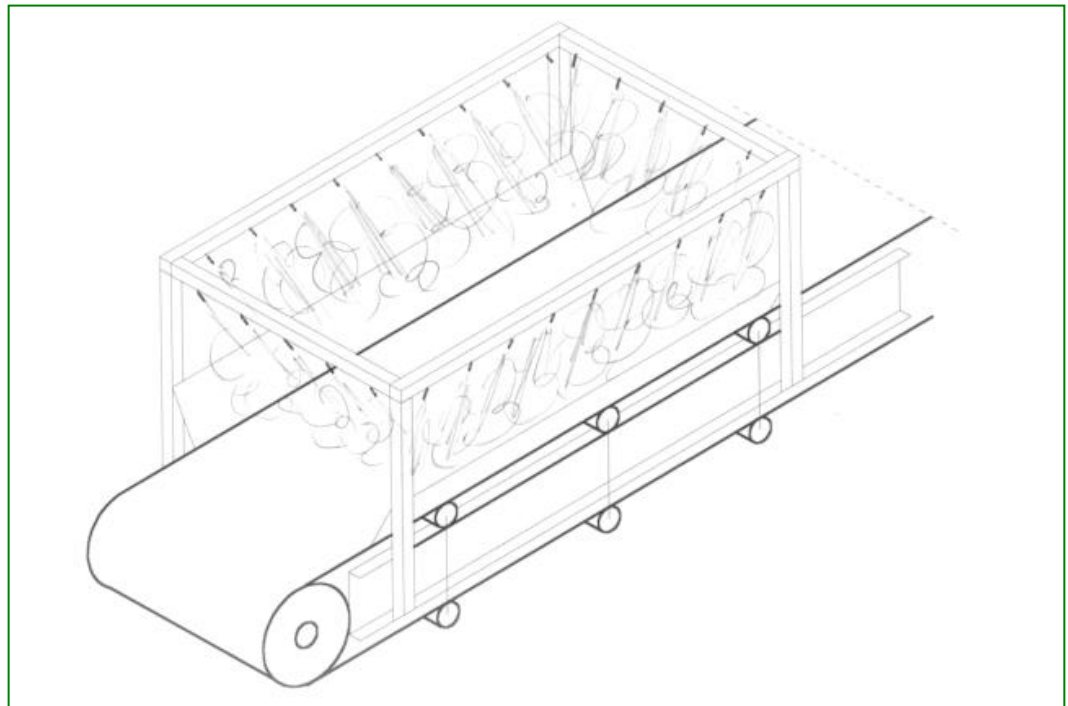
## Flexi~Fog System ~ Layout and Design Factors



Lines and Nozzles are arranged to form a wall or curtain of fog at belt drop off points. Dust trying to pass through will be contained.

At belt load points, dust will travel sideways when to convey material hits the belt.

A curtain of fog encloses the dust on all four sides. Dust trying to escape will have to past through the fog where it will be contained and suppressed.

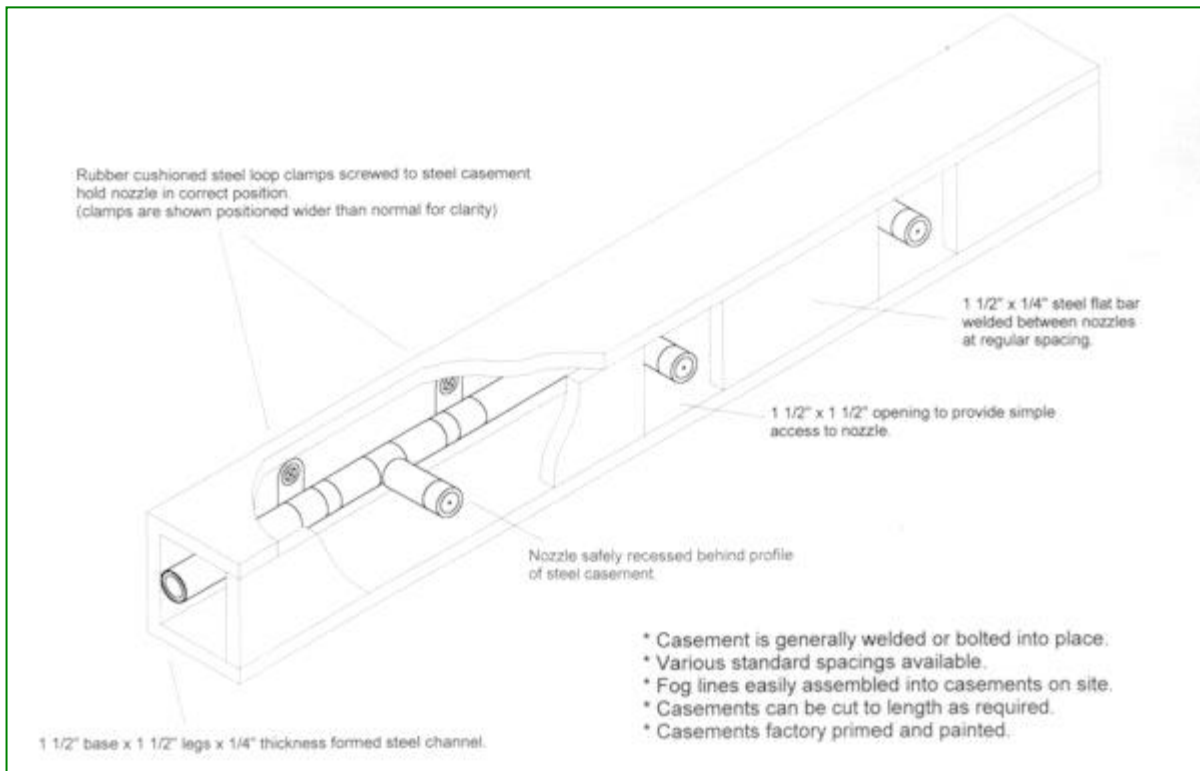
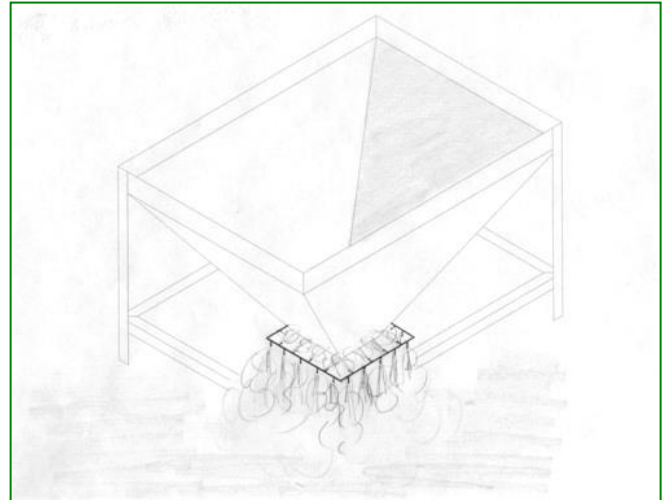


## Flexi~Fog System ~ Layout and Design Factors



Lines and nozzles are arranged to form a cover at hopper fill points.  
As the hopper is filled, dust traveling upwards will be contained.  
Each treatment zone within the fog system can be automated to operate as required.

Lines and nozzles are arranged to form a curtain at the hopper exit point.  
Dust trying to pass through the fog will be suppressed and contained.



Casements are specially fabricated and used to protect the lines and nozzles from falling debris and other hazards.

## Flexi~Fog System ~ Layout and Design Factors

### Dust Characterization

The number of nozzles to be used at each dust treatment point is a factor of how much dust is being created. High volumes of finely crushed aggregate with a low moisture content create the most dust while materials like recycled paper do not generate as many particles of dust at any given volume.

### Nozzle Density

The number of nozzles in operation at a dust treatment point can be increased or decreased by spacing the nozzles more closely together or wider apart during the installation process. As installing Piian nozzles is a very simple matter, it is good practice to start the installation using a wider than anticipated nozzle spacing. After operating the system for the first time, dust reduction rates can be observed, if sufficient dust suppression is not occurring, then additional nozzles can be spliced in very easily. Conversely if there are too many nozzles at a treatment point, nozzles can be replaced with nozzle plugs.

### Nozzle Position

The effective throw distance of an atomization nozzle is 10 feet / 2.5M, however, environmental factors such as wind or air flow created by the conveyed or processed material must be taken into consideration. The principle is to mix the atomized water droplets with the dust or to install the nozzles to form a curtain of atomized water to prevent dust particles from escaping. The atomization nozzles need to be positioned back from the process material at a suitable distance to allow the atomized water droplet to effectively contact and mix with the dust, but not so far as to allow air flow to blow the atomized water away or so close that the water does not have time to atomize or so close that the atomization nozzle could become submerged or damaged by the process material.

The atomization nozzles can be secured in position using tubing clamps (part# LHSC0002), in which case the clamps hold the nozzle body and are then screwed or bolted to a suitable flat surface. Optionally, where no surface exists to use hose clamps, stainless steel hanger cable and turnbuckles may be used (parts # LSAC0001 and part# LSCT0001). The stainless steel cable is strained between two anchor points and tightened using the turnbuckle. The manifold tube and atomization nozzles are then zip tied to the cable.

