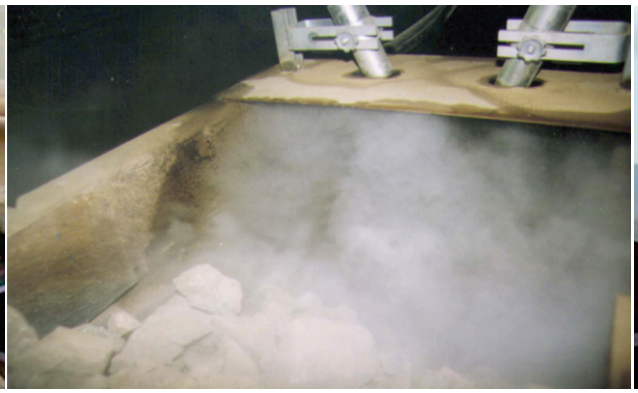
Complete Dust Suppression !

More than just nozzles...


Dust Suppression Systems can be an extremely cost effective alternative to Dust Extraction Systems for fugitive dust control, in bulk material handling plants. At times, it is the only solution when it comes to large dust-prone areas and stockpiles, which cannot be controlled by dust extraction for practical and economical reasons.

The inclusion of Dust Suppression Systems has become a standard, and is today an integral part of a material handling system to prevent fugitive dust nuisance which violates environmental norms, adversely affects plant and machinery life & operation and reduces workplace productivity. The system also has a payback as it prevents loss of raw material during handling, and also provides the additional benefit of not having a secondary pollution problem as the dust is retained in the material itself.

We at F. Harley & Company Pvt. Ltd. are proud of the fact that we have pioneered the introduction of Dust Suppression Systems in India since 1986 through the Chem-Jet Dust Suppression System. The technology for this proven chemical mixed water based dust suppression system comes through a technical collaboration with the erstwhile Dust Suppression International Ltd., U.K.

To complement the Chem-jet system, in view of ever increasing stringent legislations, realization of better Corporate Social Responsibility (CSR) standards, and acute water shortage in industrial areas, the company also introduced the Agglomerative Dust Suppression (ADS) System (popularly referred to as the Dry Fog Suppression method) through a technical collaboration with The Raring Corporation, U.S.A. in 1999, which is still an on-going relationship, supporting the dust control cause in India, through the wide and valuable experience in the North & South American market.

The Dust Suppression Systems are custom designed to suit specific applications after a detailed analysis of the site conditions and can be used in the following areas:

- Wagon/Truck Tipplers
- Dump/Track Hoppers
- Barge Loaders/Unloaders
- Stacker/Reclaimer
- Crusher/Screen Discharge
- Vibrating/Paddle/Apron Feeders
- Belt Conveyor Transfer Points
- Stockpile/Stockyards

Market leaders in this field, F. Harley & Company Pvt. Ltd. have today designed, manufactured, supplied, erected and commissioned over 300 installations in India and abroad covering a wide range of applications for coal, lignite, iron ore, dolomite, bauxite etc.

www.harleygrp.com

#1 DUST CONTROL SPECIALISTS

ADS Dust Control System – "Nature's Way"

Dust that becomes airborne on the surface of the earth rises on thermal currents. Water, evaporated from oceans and lakes, rises also but condenses as the atmospheric temperature falls. Tiny water droplets created through condensation agglomerate with the dust particles. When the agglomerates become large enough, they fall as rain and return the "pollution" to earth.

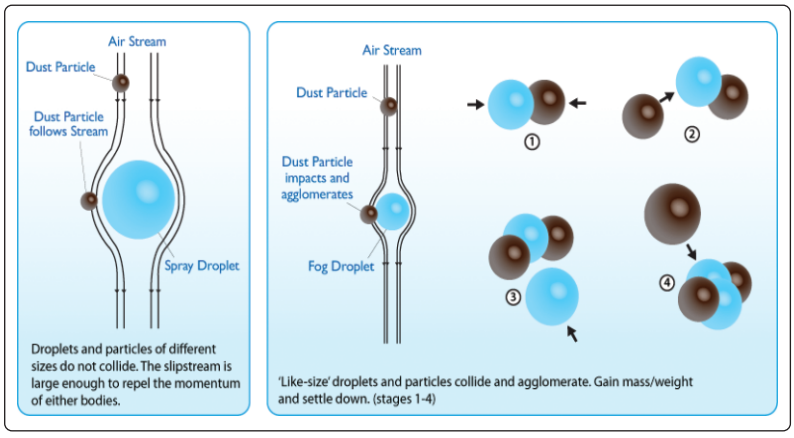
Why ADS™

In times when air pollution is a major cause of concern with emission norms becoming even more stringent and with the consistent depletion of water resources, the ADS Dry Fog based Dust Suppression System is found to be the only effective solution to dust pollution in bulk material handling plants in comparison to any other prevalent or known techniques for applications and materials which are not moisture sensitive.

The ADS System is also the only dust control method which covers fine particulates in the respirable range of PM 10 and PM 2.5, and replaces the conventional Dust Extraction in almost all applications in bulk material handling plants. In comparison to the Wet Dust Suppression method wherein the moisture addition is typically between 0.5% - 1.5% of the material handled, the ADS System adds approximately 0.1% moisture to the material handled. This difference in moisture addition also hugely affects processes which require combustion.

The ADS™ operating principle

This unique method which tackles dust emission at the source itself requires no chemicals to reduce surface tension of water and to enable atomization of fine droplets. Instead of using a chemical, plain water is atomized through the injection of compressed air in a ratio at sonic velocity through our highly efficient acoustic oscillator dual fluid nozzles producing millions of miniscule water droplets (0 to 30 microns in size) in the form of a DENSE DRY FOG, which when kept entrapped within an enclosure at a dust generating application points, can efficiently contain and control dust emissions at source.



The basic principle of ADS™ System is generation of like size water droplets and its collision with dust particles causing agglomeration with other dust particles and its growth in size and mass. Finally, the mass becomes large and heavy enough to settle back onto the source material where they are carried through the process without any special handling. The quantum of agglomeration which directly affects the success of the dust control is heavily dependent on the existing containment arrangement of the dust and fog.

What is Dry Fog ?

Fog created through mechanical means similar to natural fog utilized to control dust in bulk handling operations. The term Dry Fog depicts the quality of fog created which is like natural fog, which does not cause wetness but is based on moisture. It does not create wetness because the droplet sizes are too small to burst. Rather, the fog droplet size enable agglomeration.

- Dry Fog is defined as 0-30 micron water droplets.
- Dry Fog easily agglomerates with airborne dust due to similarity in particle size.
- Dry Fog creates nearly 100% humid environment in which evaporation and condensation are constantly occurring. Condensation and nucleation allows collection of sub-micron particles.

Dry Fog is generated only through dual fluid sonic nozzles, generically known as the air driven acoustic oscillator nozzle, which is the heart of the Dry Fog Dust Suppression System. These nozzles have been in use since the early 70's, and have been a proven design for Dust Suppression application across almost all bulk materials applications.

The ADS Dust Control Strategy :

#1. Contain the Fog and Dust

To control dust the first principle is to contain the dust and isolate it from the ambient. Such a containment helps create an environment in which agglomeration of fog and dust can occur easily.

#2. Apply Fog at every Dust Source

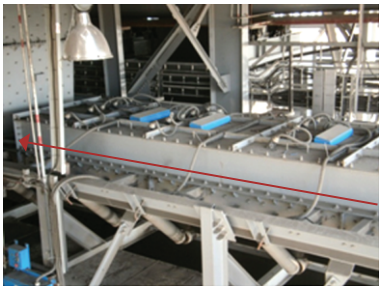
Required quantum of nozzles are to be installed within the enclosures so that dense fog is projected to the areas of dust generation (chutes, impact zones) and also fills the entire containment zone. Fog is to applied at each and every nuisance point, as it does not wet the material like the traditional wet dust suppression method, but only the dust generated at the nuisance point.

#3. Provide Retention Time

The retention time for the fog and dust within the containment zones is required for good dust control. This however depends on a number of factors as well as applications i.e. material fineness, belt speed, TPH, belt width, height of fall etc. Generally, based on experience the size of enclosures at transfer points is five times the belt width in length downstream of the chute, and one time the width upstream of the chute, and one time the width in height to a maximum of 36" above the top of material. Baffles installed in these enclosures assist in retarding the displaced air and aid the agglomeration process.

#4. Provide Collection Surface

Collection surface is any surface exposed to the fog / dust environment. The containment walls are the primary collection surface assisted by the presence of baffles and even curtains as well other surfaces inside the enclosure to help collect the airborne particulates.

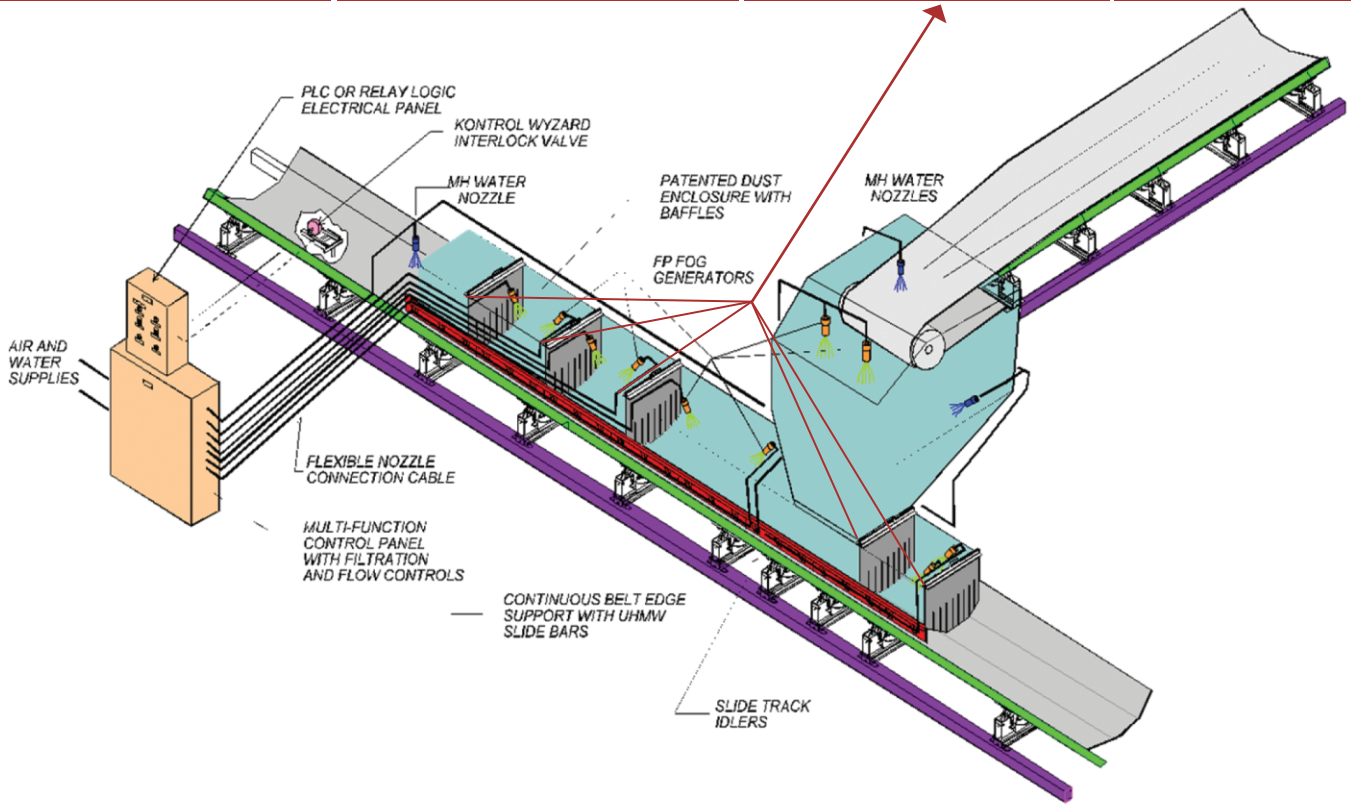


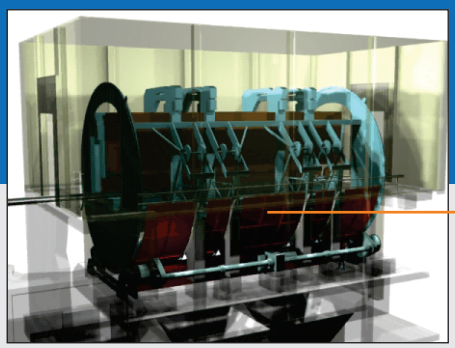
Skirt Length :
5 x Belt Width

Skirt Height :
1 x Belt Width

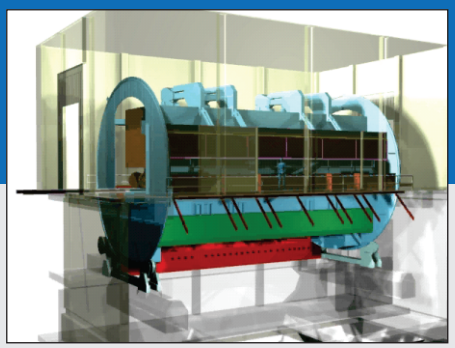
'Baffles' for retarding displaced air velocity

Tight Skirt Sealing





'Contoured Enclosure ' ensuring containment of Fog and Dust



'Brush Seal' - brushes over the Contoured Enclosures and seals the escape of Dust and Fog from the underside of the Wagon Tippler

Dust Containment
– a necessity to make the fog work

It is often thought that installation of fog nozzles alone can achieve effective dust control. Not so. Enclosures and arrangements are required to contain both the dust and the fog to enable effective agglomeration, which are inherently expected to be in place which would adequately contain the air movement caused within the material handling system / process to avoid handling and processing losses. This aspect hugely affects the effectiveness of dust control as it provides the retention time required for the dust and fog to agglomerate without which dust control cannot not be effective.

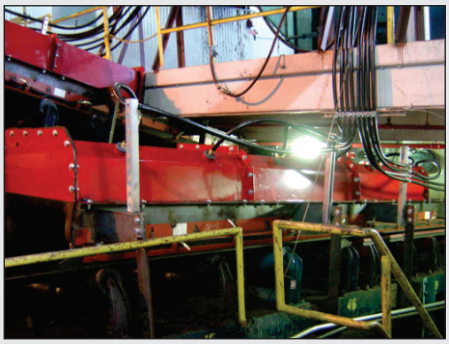
But, based on practical experience and observation it is often seen that the prime reason for dust nuisance is the inadequacy of proper containment arrangements either inherently or in the process of repairs and maintenance. This results in a compromise on effective dust control and a direct loss of material wastage.

These could be avoided or set right as per the visuals.

Arrangement could be applied for Multiple Side Tippling

Containment in Payloader Application

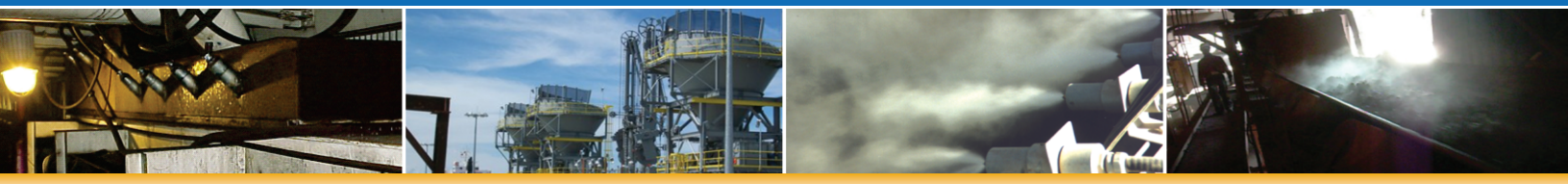
Containment in Dump Hopper Application



Conveyor Transfer Application

Flexible Enclosure in loading application

Wind Fencing around ore pile



The ADS™ System Speciality - more than making 'dry fog' alone

The ADS™ System, is one such comprehensive system which has pioneered the upgrade, and successfully scored over the conventional 'dry fog' systems through incorporations made, from on understanding of practical field issues.

The ADS™ System is indeed a philosophy by itself in 'dry fog' dust suppression.

Making the fog
- through sonic nozzles with integrated acoustic oscillator, consistently

Managing the fog
- change air / water settings and individual nozzle shut off

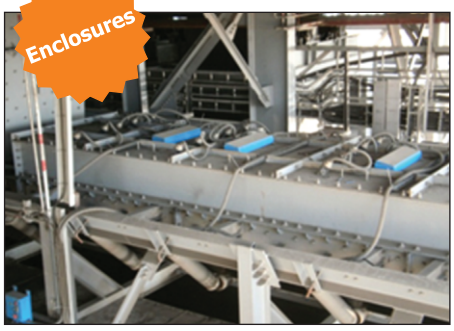
Monitoring the fog.....
- easily allows the operator to 'feel' the fog in the daily walk-by-the-system
- provides immense convenience in on-line check on fog generation, performance & adjustment of fog quality
- a real time saver !

.....necessary, considering the aggressive application and the investment made for it to perform in such conditions

3M's of Fog

The ADS™ Features

- Most effective and lower compressed air consumption
- Superior equipment quality & components
- Best User-friendly controls
- Can be retrofitted in any existing plant



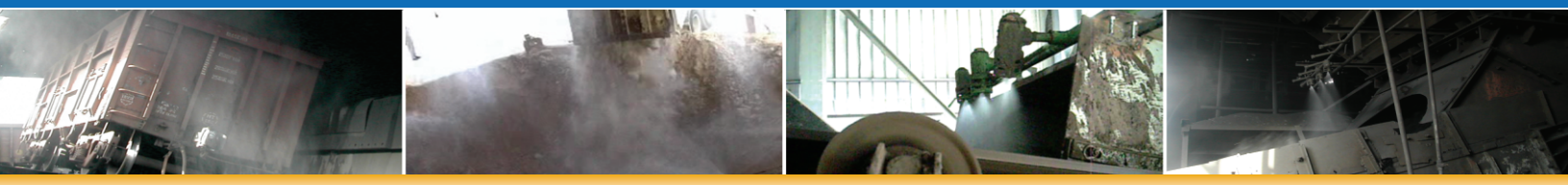
- On-line nozzle maintenance /replacement
- On-line 'Fog Inspection'
- Better Agglomeration of Fog

- Driest Fog quality produced
- Most Robust Nozzles
- Imported Nozzles from TRC
- Optimum Moisture addition

Benefits of the ADS™ System

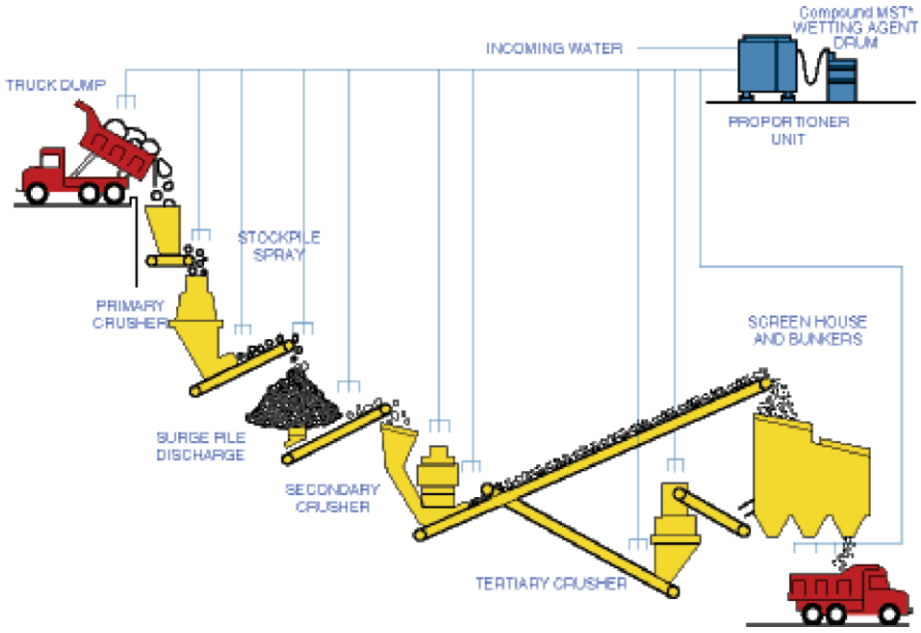
Most Energy Efficient & Effective Dust Control Solution

Will Create a higher urge towards better Housekeeping



Chemical Dust Suppression System - Chem-jet

'Chem-jet' Dust Suppression System is designed to add a controlled amount of water, with a patented wetting agent (Compound MST*) at application points to precondition the material and reduce the level of dust escaping into the atmosphere during operation. The fundamental philosophy is to suppress the dust before it becomes airborne which makes it a preventive form of Dust Control. The treatment is effected upon the material by spraying a finely atomized mist at strategic points by specially designed spray nozzles, exclusively for dust control applications through a network of piping, pumping unit, dosing unit and flow control devices. Moisture addition is typically 0.5-1.5% depending upon the application.

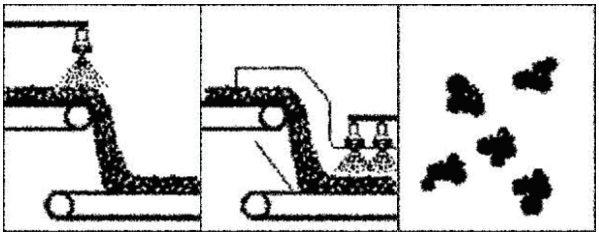


The fundamental concept of Dust Suppression technique is based on three Key factors. The factors are as follows:

Key #1: Pre-treatment
Wetting of material surface to cause agglomeration of small particles prior to dust generation process.

Key #2: Confinement
Fine atomized spray pattern isolates the dust emission/generation areas and keeps the generated dust within the treatment zone.

Key #3: Precipitation
Fine droplets of solution entrap the air borne particles. Smaller particles are agglomerated and made heavy, causing their precipitation with the mass of main material.



Key #1 Key #2 Key #3

Note: Compound MST is a bio-degradable, non-toxic, odourless chemical and has no effect on process material, conveyor belts and plant operating personnel, therefore environmentally acceptable.

Features of Chem-jet System

- 'Chem-jet' Dust Suppression System components/hardware provides add-on facilities for any bulk material handling plant without any major modification of the existing plant/equipment.
- Compound MST when mixed with water at a ratio of 1:3750 results in a solution that has tremendous wetting, penetrating and spreading powers which effectively promotes contracting, confining and agglomeration process. No other competitor has such an effective wetting agent.
- Designed for trouble free operation with easy maintenance facilities.
- Various nozzle designs are available with different spray patterns to suit wide range of applications.
- Proven concept having many operating installations in India and world over.
- Operates automatically depending upon material flow.
- Lower installation and operating cost compared to any other dust control devices.
- Nominal consumption of Compound MST per tonne of material handled.
- Covers wide range of application areas including open stockpile/stockyard.
- Reduces loss of material and increases profit margins.
- No secondary pollution.
- Reduction in dust emission level at subsequent handling stages due to carry-over effect.




Stockpile Dust Control

In addition to the dust control for bulk material handling plants, the yard or storage area is a major zone of dust control. The challenges are manifold due to the vast open area and the wind factor which can blow dust causing wide spread dust nuisance, if not controlled.

In addition to the dust nuisance, there lies a safety hazard for self ignitable materials ex. Coal, if not wetted periodically.

Hence, the most effective solution applied in tackling both dust nuisance and the possibility of self ignition, Stockpile Sprinklers are installed along the yard for uniform wetting of the stockpiles. These can even be installed on top of the stockpiles too, in case of Gantries or Closed Piling areas. Depending on the coverage area and optimization of the system the sprinklers may be static or having a rotation of 180° / 360°.

These systems are at present being specified to be operated in semi automatic or fully automatic modes with the inclusion of sophisticated weather monitoring instrumentation and devices, and is designed for sequential auto operation of each sprinkler based on the contour of the stockpile and the rate of evaporation of moisture from the stockpile surface.

The stockpile sprinkling is done mainly with plain water, and in special cases through dosing with Compound MST.






Experience & Track Record

Pioneers and market leaders in the field of Dust Suppression, with over 300 installations in India and across Asia, we have more than 25 years of accumulated experience in Dust Control Solutions across both Dust Suppression and Dust Extraction Systems, having supplied through well established OEMs such as L&T, BHEL, Tecpro, McNally Bharat, Thyssen Krupp, TRF and several others. We are approved by major consultants/end users such as M N Dastur, EIL, DCL, TCE, Desein, Humphrey & Glasgow, Mecon, SAIL-CET, NTPC, Adani, TISCO, RINL, SAIL and have executed several prestigious projects both in the private and public sector. We have supplied directly to several end user customers in the areas of power, steel, metallurgical, cement, mining and mineral handling and other process industries.

Services Offered

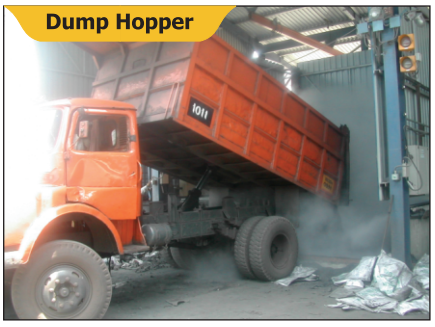
Design & Engineering | Manufacturing | Site Supervision | Installation |
Operation & Maintenance | AMC | Retrofit of Existing Systems

Challenging Applications in action

Wagon Tippler



Dump Hopper



Why F. Harley is your best Dust Suppression solution provider

- Technical Collaborations with world leaders
- Proven technology
- Widest experience
- Largest Installation Reference List
- Complete dust control capability
- Can deliver turnkey systems
- In house manufacturing
- After sales and field support
- Knowledgeable team of engineers
- Ready spares availability
- Guaranteed Performance of systems
- Strong quality control
- Complete support on civil and electrical side
- Flexible to meet customer requirements
- Timely deliveries
- In house testing facilities
- Approved by all major consultants
- Enjoy the confidence of OEMs and End Users
- Back up support from collaborators

Other Products

Dust Extraction System

Conventional Bag Filters | Cartridge Bag Filters | Insertable Type Cartridge Filter Units |
Insertable Type Cassette Filter Units | Cyclones | Centrifugal Fans | Filter Bags

Acoustic Cleaning Systems

Humidification & Ventilation System

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