



# Proposals to Rectify Baghouse Problems for Zero Discharge System

**Dr. Parag Dalal**

Asst. Prof. School of Studies in Environment Management, Vikram University Ujjain

**Abstract** – The air pollution industry is having a *BOOM* after COVID-19 pandemic, to stop this we try various methods of Environment air pollution restoration measures in India. [1] One of the best methods for Particulate Matter (i.e. PM<sub>25</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>) removal from air is Baghouses. [2] The operation of these bag houses must have the assistance of effective particulate emission monitors,[3] so that the filter problems mainly the Cake formation and Leaks from wear and tear can be analyzed and rectified in live feed. [4] Now a day's various regulations are also imposed by various agencies and government in this field. [5] These measuring instruments also serve as a feed-back provider for plant assessment. [6]

The  $\eta$  (efficiency) of bag houses comes decades forward now days and so they are used more now days and reduce the running cost of an industry with maximizing the product  $\eta$  and minimizing the emissions. [7]

## **What we want?**

We want to achieve the 0 emission target with minimum efforts so we are working hard on it and are in close proximity of achieving it.

**Key Words** – Particulate Matter (i.e. PM<sub>25</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>), COVID-19 pandemic, bag house, operation, cost effective, filter problems, cake formation, leaks, wear and tear,  $\eta$ , 0 emission target.

**Introduction** – The bag houses or bag filters are also known as Cartridge Filters, as the name suggest they are removed, washed and refitted as cartridges are done. [8] The filter bag is present in various shapes and sizes but all of them are fitted over a metal cage of same shape and size as the bag. [9] These bags are hanging in vertical rows, the filtration occurs when air passes through the bags. [10]

**Material and Methods** – The particulate matter is been collected from outside the bag in cake formation and also in hopper beneath the bags. [11] This cake provides more efficient filtration, from time to time this cake must be removed from filter bags so that cleaning and airflow is not obstruct by this cake formation. In current practice the cake cleaning of bag filter is done by reverse jet stream of air or water. [12] The air tries to blow the particulate matter from filter media and accumulates in hopper. In the jet of air the cake cracks, opening the pores of the bag house filter again. This cake falls gravitationally into the dust hopper were it can be collected easily.

After the reverse pulse is removed from the bag house the filter media resumes its work and retains original shape within a time Lapse of 30 – 40Sec. the pulse applied to particulate matter cake is top up with a jerk now a days for efficient cleaning of the cake formation between filter cartridges of bag houses.

**Proposal** – A particulate monitor is been fixed in the bag house duct downstream of the filter plant, this is all to discriminate the filter cleaning from normal routine operations. The magnitude of these dust cake peaks; reflects the condition of filter media been cleaned efficiently. Generally now days the filter plants do regular cleaning which just requires a pulse from the first row top cleaner; this will clean the whole system quickly within 2 to 3mins. This can be controlled by particulate sensor control unit for each row of filter media. This unit takes on account of particulate matter going in flue gas and also the management of cake formation and cleaning efficiency.

### Why we need a Sensor Control?

This is because in normal technology used generally we can easily identify failing of the bag filters individually but cannot find any leaks in the filter. The sensor control can find the filter media leak location of particular bag and can stop the function of that bag filter individually so it's not affecting the whole process much. This stoppage of the bag house indicates enabling the maintenance staff to see and change the multiple filters simultaneously.

**Proposal 2 – Filter Leak Monitors** – These instruments are used for changes in monitoring of particulate matter generally used in bag filters. This provides a tool for minimizing the emissions from a defined process and these also monitor plant malfunctioning.

Some quality assurance features are also required in addition to reliable measurement in bag leak detectors also provide a good functional operation and quality assurance. In addition of providing a leak data monitoring these latest systems are so powerful that monitoring of efficiency of filter cleaning, faulty rows, faulty media, large cake formation, compartment data etc can be analyzed in real time.

**Conclusion** – Installing these bag houses will reduce the operational and filter cost also various calculations can be done with permutation combinations of monitoring and editing the particulate matter waste from the bag house resulting reduction in time scale cost and filter media replacement cost too this low cost running technique helps industries to earn.

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