International Journal of Global Science Research
Vol. 10, Issue. 2, October 2023, pp. 2110-2112
Available Online at www.ijgsr.com

ISSN: 2348-8344 (Online)
DOI: 10.26540/ijgsr.v10.i2.2023.244

Research Paper

Cost effective Filter Cake Buster in Bag-House

Parag Dalal
School of Studies in Environment Management, Vikram University, Ujjain, Madhya Pradesh, India
Email: paragdalal@rediffmail.com

Received: 10/06/2023
Revised: 20/06/2023
Accepted: 25/06/2023

Abstract: The Particulate matter (PM) is one of the biggest air pollution problem in the world now a day's (Dalal 2010). Besides the particulate matter there released the hot gases which are very useful by-products. Many exotic principals were used for Particulate matter like Electro Static Precipitator (ESP), Scrubbers, Wet Scrubbers etc. (Dalal 2014) but the mostly used ones are Bag-Houses which are also known as Dust Collectors (Dalal 2014). These dust filters have gone through an impressive evaluation over the decades passed by. This has increased their efficiency (ŋ) by Milestones. This efficiency increase lowers the emission levers to a large extent downstream the stack helping the people living there with dealing less pollution problems.

Keywords: Extinct, Electro Static Precipitator (ESP), Scrubbers, Wet Scrubbers, Particulate matter (PM), Bag-Houses, Dust Collector, milestones, evaluation.

Introduction:

The Dust collecting bag elements in the house of filters are modeled in various different ways (Dalal 2015). This difference is due to various manufacturers present who did not need to go for the technical necessity of the bag-house modeling (Dalal 2010). The filter element can vary from a bag to a hose form, or to a plated cartridge, also the material is made up of various materials from organic to woven to synthetic fabric to a Fleece (Dalal 2016).

The dust collecting materials inside of a filter bag house is designed in different ways these tend to priories of each manufacturer and his preferences and other technical issues and necessities (Dalal 2020). Depending on its basic principal the cloth used for filter is been internally supported to stop its tearing by steel frame or metallic frame, cage, grids or tubes on the downstream of the plant (Dalal 2010).

What we can do?

Most dust collectors are designed for continuous operation and have variously

International Journal of Global Science Research
Vol. 10, Issue. 2, October 2023, pp. 2110-2112
Available Online at www.ijgsr.com

ISSN: 2348-8344 (Online)
DOI: 10.26540/ijgsr.v10.i2.2023.244

designed blowback systems to periodically clean the filter element from accumulated dust loads. According to local government regulations, the entire filter system may require approval for specific applications or be subject to regular inspection by public authorities time to time [7]. In some industries, filter houses can be huge in size to accommodate a single exhaust stream and to ensure proper operating conditions and dirt holding capacity and generally cleaned every semester i.e. twice a year.

More dust collectors can be found in less harsh environments. They are the "normal" size, but should still provide very low and stable emissions. If the dust filter fails and the production process covers an entire area with dust, the operator of such a factory risks damaging their health, vision, prosperity with local and neighborhood reputations. In other words, regardless of governmental or regulatory requirements, there are many good reasons why such dust collectors need to be monitored continuously.

How we can do?

However, the filter element must perform demanding tasks, during operation; dust particles collect on the surface on the inlet side and rapidly form a so-called filter cake inside the bag-house system.

This filter cake has a finer surface structure, which significantly improves retention. Filter cake, on the other hand, increases the pressure drop across the filter element, thus always reducing the outlet flow rate. Modern dust collectors have a Delta P controller that triggers the blowback sequence. A blowback system basically consists of a capacitive tank of sufficient capacity to store compressed air and a series of valves and piping that direct the air injection downstream of the filter element, thereby reducing the filter cake. Reduce speed on the backward system to loosen the filter cake. Flowing upstream, the accumulated dust is forced to flow and fall towards the bunker chamber at the bottom of the house. Backflow occurs while the entire filter is working. This explains why the dust falls in sequence towards the bunker.

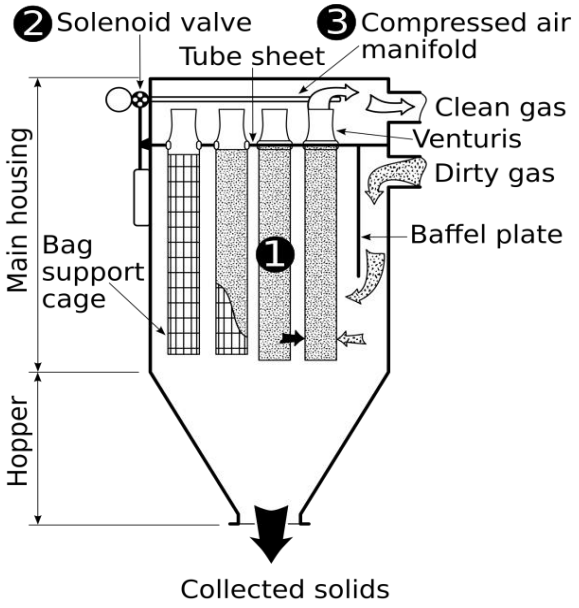

Photo-1 Baghouse working
https://www.google.com/imgres

Outcome

Considering the mechanical forces that the filter cloth is subjected to during this reverse flow process, it is easy to imagine that the service life of the filter element is limited. Worse, these elements degrade over an unpredictable period of time, much like a sock that wears out over time before it actually punctures. This wear is mainly caused by the relative movement of the filter material on the support basket, the recoil impact, and partly also by abrasive dust particles. A small amount of material wear does not necessarily mean that the filter element will fail. As the structure thins, the filter cake builds up again, but for a short time a large amount of residual dust slips

ISSN: 2348-8344 (Online)
DOI: 10.26540/ijgsr.v10.i2.2023.244

through. This process continues until the organizational structure is completely destroyed.

Conclusion:

A major obstacle to a widely accepted method of monitoring non-essential or small dust filters has been the availability of affordable controllers. The usual miniaturization of advanced optical devices, widely used in regulated applications, has not been able to reach an acceptable ratio that makes the investment in the dust collector itself worthwhile. Therefore, it is common practice to replace the filter element according to a schedule regardless of the condition of the filter element. A way to overcome this dilemma might be to introduce a highly established technology that can be used as a low-budget monitoring device, yet has great potential to improve the operating efficiency of dust collectors.

References:

Dalal P. (2010) Modeling and Sensitivity analysis of 10µm dust particle separation (PM_{10}) for Uniflow aerodynamic Dedusters Journal of Environmental Research and development Vol. 5(1) 34–45.

Dalal P. (2014) Modeling and Environmental Impact Assessment Implementation by Noise and Air pollution reduction of Indian Heavy Diesel Trucks on Highways International Journal of Plant Animal and Environmental Sciences Vol. 4(1) 370–375.

Dalal P. (2014) Pollution Monitoring in heavy traffic sites With Moss Sampling International Journal of Recent Biotechnology Vol 2 (4) 49–51.

Dalal P. (2015) Modeling of Air Quality Index International Journal of Advanced Research in Engineering & Applied Sciences Vol 4 (9) 1–11 ISSN 2278–6252.

Dalal P. (2016) Sweet air Flux in Indian Savanna International Journal of Research Vol 2(4) 2016 34–39.

Dalal P. (2017) Proposal of Multi–Hazardous Wastes For On–Site Disambiguation Management In Ujjain, India International Journal of Chemical Studies Vol 5(4) 01–06.

Dalal P. (2017) Low Cost Dust Collector Model For Calcareous Shale Industry At Mandsaur Of Madhya Pradesh, India International Journal for science and Advance Research in Technology Vol 3(8) 436–441.

Dalal P. (2020) Assessing The Air Quality In Ujjain By Artificial Neural Network International Journal for science and Advance Research in Technology Vol 6(11) 44–54.

Dalal P. (2023) Disambiguation of Municipal Solid Waste to Syngas in Ujjain District by Plasma Gasification Technique International Journal of Novel Research and Development 2023 Vol 8(4) 359-364.

Web https://www.google.com/imgres