Smart Brief

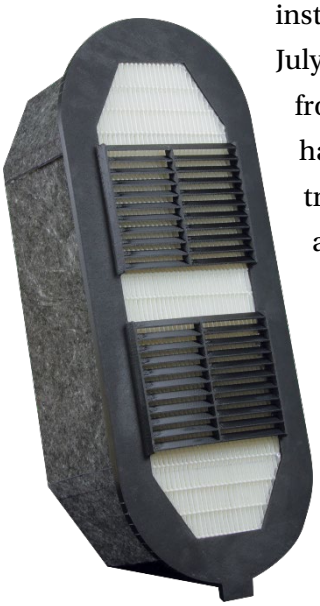
BHA® TotalPleat™ A Success Story

BHA® TotalPleat, a Filter that Significantly Improves Pressure Drop and Airflow

The quest for compact dust collectors in the industrial filtration arena has led to the increased use of filter cartridges. Amongst these dust collectors is one developed by a competitor using PowerCore® filter cartridges. When filtering dust that doesn't easily release from the filter media, cartridges often plug and restrict airflow. Soon several customers and operators of these smaller dust collectors found themselves dealing with filter issues and contacted Parker Hannifin for a solution.

Parker Hannifin's engineering team used advanced engineering tools such as Computational Fluid Dynamic modeling and 3D printing to design a filter cartridge that can handle more demanding conditions. Innovations such as the louvered grid on top of the filter not only more evenly distributes the cleaning air but also serves as a handle for cartridge removal and ASHRAE 199 testing validated the new design. After extensive analysis, laboratory, and beta-site testing, some of the first BHA TotalPleat cartridges were installed in September of 2019 in a collector in the southeast United States. The collector, on top of a cement loadout silo, is in plain view of the adjacent interstate and visible dust emissions would attract immediate attention.

With the new TotalPleat cartridges, a remote monitoring device was installed to track the collector's performance. As of July 2020, there had never been any visible emissions from the TotalPleat filters and differential pressure has been excellent (see chart on page 2 for the dp trend). Ten months after installation and without any maintenance, TotalPleats are still running strong while the original OEM cartridges had emission and pressure drop problems within the first three months of operation.



What is noteworthy is that during the first days of operation, the filters were slightly damaged because the header pressure for the pulse valves was accidentally set to 100 PSIG instead of 60 PSIG. This has not caused any operational issues or emissions and speaks well for the robustness of the new design.

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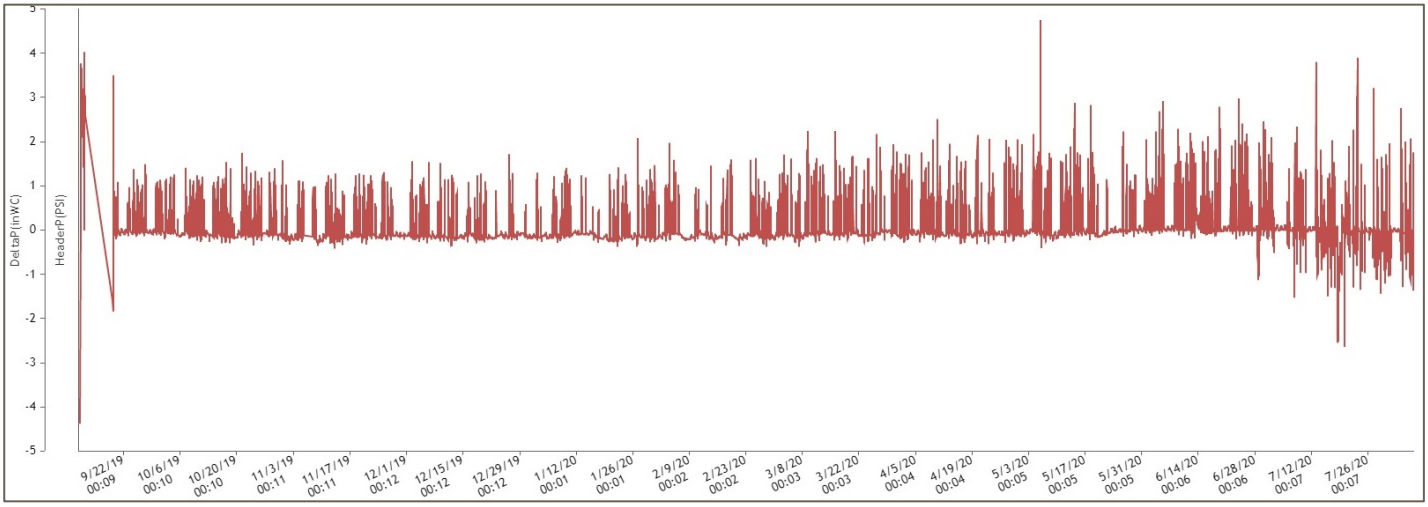
Differential Pressure



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The Details

The cement dust filtered by the TotalPleat cartridges has more moisture than normal, can be sticky, and harden on the filter media when the moisture condenses. The intermediate use of this collector favors condensation and moist dust. To avoid excessive dust buildup, the cartridges are being cleaned continuously during collector operation. Off-time, the time between pulses is 23 seconds and results in one complete cleaning cycle every three minutes. The continuous cleaning requires a tough filter media to withstand the high number of impacts generated by the pulse valves. By July 2020, the cartridges had received over 30,000 pulses. There were no visible emissions and differential pressure was excellent.

Why do the TotalPleat Filters Perform Better?

Pleated filters and cartridges pack a lot of filtration surface into a small space. This results in narrow gas passages that get clogged by sticky dust. Optimizing pleat geometry to balance filtration area, gas velocities, and dust release was key to the improved performance of the TotalPleat cartridge. The louvered grid improved cleaning efficiency by properly distributing the cleaning energy to the entire pleat pack. That is why BHA TotalPleat has longer filter life and the ability to better discharge the accumulated dust. In several instances, TotalPleat life has quadrupled compared to the OEM cartridge.

The TotalPleat filter cartridges are a direct replacement for the Donaldson PowerCore CP filter part numbers P032358-016-340 and P280356-016-340 and have a MERV 15 efficiency. TotalPleat cartridges are incinerable.

Powercore® is a registered trademark of Donaldson Company, Inc.

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