TOTAL FILTRATION SERVICES

Revolutionizing Paint Filtration: How the BowTie Filter Boosted Efficiency for Truck Industry Leader

Customer Case Study

PROFILE

This case study examines a centenarian American truck manufacturer with a robust national and international presence. Known for leading the industry and serving a wide range of clients, from long-haul to local delivery, the company's commitment to innovation and customer service has kept it at the forefront for over a century. Total Filtration Services (TFS) approached the lead paint engineer at their Ohio plant with a groundbreaking filtration product for their manual spray booth to address concerns of short filter life, as well as labor and waste costs. Read the full case study to uncover the impact of this new solution on their operations.

CHALLENGE

At the heart of the truck manufacturer's operations lay a pressing challenge: their manual spray booth's filtration system was falling short. The system, reliant on a combination of cube filters and poly media prefilters, demanded frequent maintenance—a situation that was far from ideal. Specifically:

- **Frequent Maintenance**: The operational setup required the blanket media to be replaced twice a week and the cube filters every two weeks. This routine not only increased labor costs but also amplified waste disposal fees.
- **Safety Concerns**: Each maintenance session exposed employees to potential injuries from handling the cumbersome, paint-laden filters. The significant risk of back and shoulder strains from lifting these heavy items was a concern, threatening both the employees' health and the company's financial well-being due to the possibility of lost time and increased medical claims.

In response to these issues, Total Filtration Services stepped forward with a proposal. The goal was to introduce a solution that would extend the life of the filters, thereby reducing the need for frequent changes and addressing the associated safety and financial concerns.

THE TFS SOLUTION

Total Filtration Services, leveraging its depth of industry partnerships and expertise, proposed an innovative solution. The lead paint engineer at the Ohio plant was introduced to the BowTie filter, a revolutionary product designed by Walk Industrial.

TFS had been considering its effectiveness in the furniture industry and believed it could offer a significant improvement for the truck manufacturer's specific challenges with capturing paint overspray in its manual spray booth.

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The BowTie filter is an innovative air filtration product designed to enhance efficiency and longevity in environments with high particulate matter, such as paint spray booths. Characterized by its unique shape, this filter maximizes surface area to increase dust-holding capacity and reduce airflow resistance. This design allows it to capture a substantial amount of overspray, leading to longer filter life and fewer changes.

TFS proposed a trial of the innovative BowTie cubes, designed to revolutionize air quality and paint overspray capture in the manual spray booth.

The solution unfolded in a carefully structured two-stage trial:

Week 1: Total Filtration Services introduced the BowTie cubes alongside blanket media, aiming to evaluate the system's initial performance and compatibility with the existing operations.

Week 2-4: The trial advanced by removing the blanket prefilter, allowing the BowTie cubes to operate independently. This phase was critical for assessing the product's capability to extend filter life and reduce maintenance needs without the additional prefilter.

Total Filtration Services supplied 40 BowTie filters, arranged in five boxes of eight, for use in one of the plant's manual spray booths. This booth, responsible for the application of class 1 paint on various truck components such as hoods, cabs, and fenders, would serve as the testing ground for the new filtration system. Meanwhile, another booth would continue with the pre-existing filtration method to serve as a control in this experiment.

Attention was particularly given to the weight gain of the filters. This metric was crucial, considering the filters' designed capacity to hold up to 45lbs of paint and the ergonomic implications for the workers tasked with their maintenance. The physical strain associated with handling the filters was a primary concern, given the necessity for workers to lift and replace them manually.

Throughout the trial, Total Filtration Services offered unwavering support to the client, emphasizing a strong partnership approach. They provided expert guidance, regular check-ins, and technical support, ensuring the trial's success and demonstrating their commitment to solving the client's challenges together.

RESULTS

At the trial's conclusion, Total Filtration Services facilitated the evaluation of the filters, which revealed a satisfactory average weight of 7lbs per filter. This finding not only alleviated concerns regarding the weight but also demonstrated the BowTie cubes' superior performance in maintaining a manageable load.

Impressed by the results and the proactive approach, the customer was convinced of the benefits and agreed to implement the BowTie filter system as part of their standard operations.

The implementation of the BowTie filter solution by Total Filtration Services marked a significant turning point in the operational efficiency and cost-effectiveness of the customer's manual spray booth operations. This section of the case study explores the tangible results following the introduction of this innovative filtration system.

Pressure and Airflow Improvements

Initially, the pressure differential measured at 0.57 (water gauge) with the prefilter in place demonstrated a notable restriction in airflow. However, a pivotal change was observed in the second week, following the removal of the blanket prefilter. The pressure differential dramatically decreased to 0.001, signifying a substantial increase in airflow. This

improvement not only enhanced the operational efficiency of the spray booth but also indicated a potential for extended filter life due to reduced stress on the system.

Waste Reduction and Labor Efficiency

Beyond the direct cost savings, additional benefits were observed in terms of waste reduction and labor efficiency.

After 4th week (pre-filter blanket removed)

Previously, the customer was replacing blanket media twice per week and cube filters every two weeks, leading to high maintenance costs and labor demands. With the introduction of the BowTie filter, the need for blanket media has been eliminated, and filter changes now occur every four weeks, significantly improving operational efficiency.

The streamlined process for replacing the filters not only reduced labor time but also contributed to overall waste reduction, aligning with broader environmental sustainability goals.

Cost Savings and Workplace Safety

The implementation of the BowTie filter solution, championed by Total Filtration Services, has brought about significant financial and operational benefits, coupled with enhanced safety measures. The introduction of BowTie cubes has led to a remarkable annual savings of $33,600, showcasing the economic and functional advantages of these advanced filtration products.

In addition to the financial gains, the strategic removal of pre-filters, as advised by Total Filtration Services, has contributed to further savings of approximately $14,000 over a period of nine months. This achievement was realized in just one booth, demonstrating the substantial impact of the BowTie solution.

A key aspect of this project was addressing safety concerns related to the handling of used filters. While the BowTie cubes are designed to hold up to 45lbs of paint, the customer proactively decided to replace the filters after four weeks, when they reached a weight of 7lbs. This decision was made to ensure safe handling weights for their employees, preventing any risk of back and shoulder strain during maintenance tasks. This careful consideration by the customer highlights their commitment to workplace safety and underscores the flexibility of the BowTie filters to accommodate safety protocols without compromising their high-capacity performance.

As we look to the future, the potential for further cost and safety benefits is evident. Should the innovative BowTie solution, recommended and supplied by Total Filtration Services, be adopted in both manual spray booths, the savings are anticipated to double.

This strategic expansion would not only amplify the financial benefits but also reinforce the commitment of Total Filtration Services to delivering filtration solutions that meet the client's needs for efficiency, safety, and operational excellence.