OPTIMIZING SPRAY BOOTH EFFICIENCY: REPLACING WATER CURTAIN SYSTEMS WITH ANDREAE DRY FILTRATION

1 EXECUTIVE SUMMARY

In the pursuit of operational excellence and environmental sustainability, industrial coating facilities are increasingly moving away from traditional "wet" water curtain systems. This case study evaluates the transition to Andreae Accordion Filters, highlighting the significant reductions in chemical usage, maintenance downtime, and hazardous waste disposal costs.

2 THE CHALLENGE: THE HIDDEN COSTS OF WATER CURTAINS

For years, water curtain filters were the standard for high-volume paint lines. However, modern facilities face several critical challenges with this technology:

- **Complex Chemical Management:** Water systems require constant monitoring of pH levels and the addition of coagulants, flocculants, and de-foamers.
- **High Maintenance:** Nozzles frequently clog, and water pumps require significant energy and periodic replacement.
- **Hazardous Waste Disposal:** Paint "sludge" collected in water tanks is heavy, difficult to transport, and expensive to treat as hazardous waste.

Figure 1: Common failure points in a water curtain system.

98.1%
FILTRATION EFFICIENCY

ZERO
CHEMICAL REQUIREMENT

3 THE SOLUTION: ANDREAE HIGH-EFFICIENCY DRY FILTRATION

The Andreae filter uses the **Separation by Inertia Principle**. Unlike traditional flat filters that clog on the surface, the Andreae accordion design forces air to change direction rapidly.

3.1 HOW IT WORKS

Paint particles, being heavier than air, cannot follow the sharp turns of the airflow. They strike the back of the filter pockets and remain trapped while clean air continues through. This allows the filter to fill deep into its pockets before any drop in airflow occurs.

FIGURE 2: THE INERTIA SEPARATION PROCESS ALLOWS FOR HIGH HOLDING CAPACITY.

4 COMPARATIVE ADVANTAGES

4.1 EXTENDED LIFE SPAN

Andreae filters typically last 3 to 5 times longer than standard polyester or fiberglass media. While a water curtain is theoretically "infinite," the downtime required to clean the tank and nozzles often results in less total "up-time" per month compared to a quick 5-minute Andreae filter swap.

4.2 FINANCIAL AND ENVIRONMENTAL ROI

The switch to dry filtration provides immediate relief in three key areas:

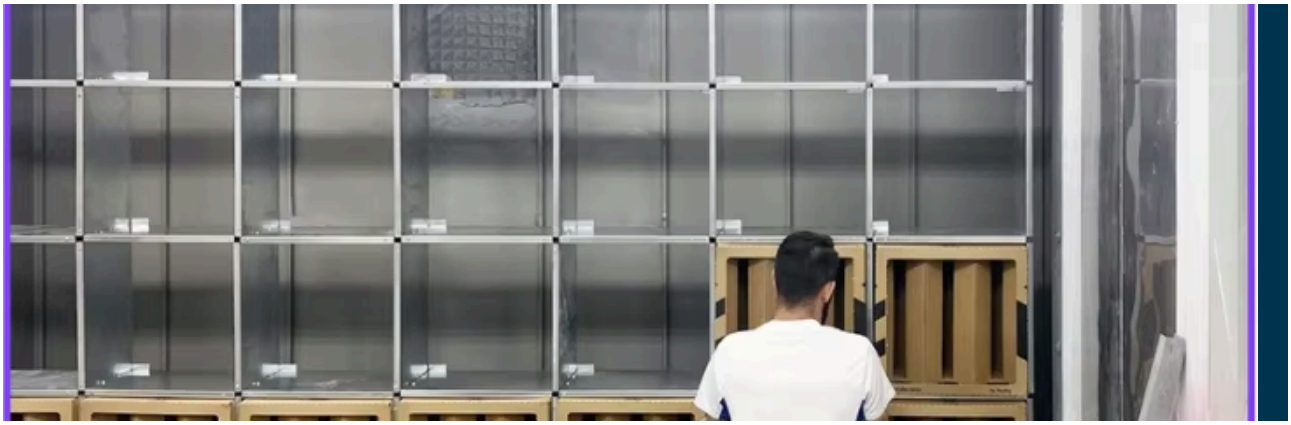
- **1. Chemical Savings:** 100% elimination of "paint kill" chemical costs.
- **2. Utility Savings:** Removal of high-horsepower water pumps reduces electricity consumption.
- **3. Environmental Footprint:** Eliminating water usage prevents contaminated runoff and significantly

5 TECHNICAL COMPARISON DATA

Annual operational comparison based on a medium-volume paint line.

FEATURE	WATER CURTAIN SYSTEM	ANDREAE FILTER (DRY)
Chemical Costs	**$5,000 - $12,000 / Year**	**$0**
Maintenance Frequency	**Weekly Deep Clean**	**5-Min Filter Swap**
Filtration Efficiency	95% - 98% (Variable)	**Up to 98.1% (Constant)**
Energy Consumption	**High (Pump + Fan)**	**Medium (Fan Only)**
Waste Handling	**Heavy Wet Sludge**	**Light Dry Material**

Table 1: Annual operational comparison based on a medium-volume paint line.



6 CONCLUSION

Replacing water curtains with Andreae filtration is a strategic upgrade that pays for itself through chemical savings and reduced labor. For companies looking to improve their "Green" credentials while lowering the cost-per-part in their coating process, the Andreae filter is the industry-leading choice.

INTERESTED IN UPGRADING YOUR BOOTH?

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