



CASE STUDY

From Risk to Reliability: Reduced Combustible Dust Hazards and Improved Product Quality with Air Dynamics Technology



Air Dynamics' sanding booth with source capture ActiveWall dust collector.

Air Dynamics Industrial Systems Corporation

Serving the industrial manufacturing industry since 1991.

CASE STUDY



Transforming air quality from poor to compliant.

Background

In modern manufacturing, efficiency, quality, and safety must operate in the same space. For companies working with **fiberglass and composite molded materials**, maintaining that balance can be difficult—especially when operations generate combustible dust.

A leading U.S. aftermarket automotive manufacturer faced this exact challenge at its mid-west facility that produces fiberglass truck caps, tonneau covers, and commercial enclosures.



Clogged filters from poor filtration.

KEY CHALLENGES

Combustible Dust Risk
Ineffective Legacy System
Air Recirculation and Cross-Contamination
Limited Visibility in Work Areas
Frequent Maintenance Burden
Space Constraints
Installation and Cost Limitations

During key finishing processes—including sanding, trimming, and cut-ins—significant amounts of fine fiberglass dust were released into the workplace. A Dust Hazard Analysis (DHA) identified a moderate combustible dust risk, while existing dust control methods proved ineffective. Dust recirculated throughout the facility, reducing visibility, impacting product quality, and increasing housekeeping demands. With a broad manufacturing footprint and hundreds of suppliers supporting production, maintaining safe, clean and compliant operations are critical.

The Challenge: Combustible Dust in Fiberglass Manufacturing

At the customer's facility, fiberglass truck caps are produced through molding, trimming, cutting, and sanding processes. These steps generate **fine particulate dust**—particularly during **gel coat sanding**, **fiberglass trimming (de-flashing)**, and window cutouts.

This challenge is common in industries working with fiberglass composites—including automotive, aerospace, marine, and defense—they all face similar risks. Whether manufacturing aircraft fuselages, boat hulls, or recreational products, the process typically includes:

- Fiberglass layup in molds
- Gel coat application
- Part removal and finishing
- Aggressive trimming and sanding (de-flashing)

It is during the finishing phase that dust generation becomes most significant. While RealTruck™ had already addressed **gel coat fumes using an air scrubber**, combustible dust remained a serious safety concern along with an ongoing housekeeping challenge.

A Common Misstep: Misapplied Technology

Before engaging Air Dynamics, the facility attempted to repurpose technology suited for a different application. A paint booth—designed for fume and gas control—was repurposed into a dust collection system by adding synthetic filtration media. This approach introduced several critical issues:

- Polyester media filtration was too coarse to capture fine fiberglass particulates
- Blanket-style media required cleaning or replacement multiple times per day.
- Dust passed through the system and was reintroduced into the facility
- HVAC systems redistributed contaminants into other production areas
- Air quality and product quality both declined
- During a site walkthrough, Air Dynamics observed visibility inside the sanding and cut-in booth reduced to **less than 10 feet due to airborne dust**.

This situation reflects a broader industry pattern: applying the wrong technology to reduce upfront cost often increases long-term risk, expense, and operational inefficiency.

The Solution: ActiveWall™ Dust Collection

Air Dynamics recommended installing an **ActiveWall™ dust collector** at each sanding booth, focusing on **source capture** rather than ambient collection.

The solution addressed several key operational constraints:

- **Limited floor space:** Slim, wall-mounted design preserved production area
- **No ductwork required:** Simplified installation and reduced capital cost
- **No makeup air system needed:** Lower energy and operating costs
- **Indoor installation:** Installed using general labor
- **Effective local exhaust:** Aligned with ACGIH recommended practices
- **Minimal mechanical and electrical requirements:** Modular, scalable design

The customer initially installed a single unit for evaluation, quickly recognizing the performance difference compared to previous approaches.

The Results: From Trial to Full Implementation

The impact was immediate:

- **Significant reduction in airborne dust**
- **Improved visibility within work areas**
- **Cleaner production environment**

Following a facility expansion and operational consolidation one year later, the customer ordered six more **Active-Wall™ units**, along with custom galvanized steel booth enclosures measuring 20' × 20' and 20' × 40'.

The Outcome: Reduced Risk, Improved Safety and Quality

With the implementation of engineered dust collection:

- **Combustible dust risk decreased** from moderate to low
- The system **aligned with NFPA standards and insurance requirements**
- **Worker safety and visibility improved**
- Product **quality increased** with **reduced contamination** and rework
- **Maintenance demands decreased** compared to the previous system

ActiveWall™ systems are typically delivered within six weeks, enabling rapid deployment when risk mitigation cannot wait.



Customer converted a paint booth to polyester filtration.

Broader Implications for Composite Manufacturing

This case highlights a critical principle for manufacturers working with fiberglass and composite materials:

Dust collection must match the hazard.

Improper dust control can:

- Increase explosion risk
- Degrade air and product quality
- Spread contaminants throughout a facility
- Create ongoing maintenance burdens

Effective solutions capture dust at the source while integrating seamlessly into existing operations without consuming valuable floor space.

Final Thoughts

The customer's experience demonstrates how quickly a manageable risk can escalate when systems are mismatched—and how effectively it can be resolved with the right engineering approach.

By partnering with Air Dynamics, the company transformed a visibility-limited, high-risk environment into a controlled, compliant, and scalable operation.

For manufacturers facing similar challenges, the path forward is clear: engineered pollution control solutions, applied correctly, deliver both safety and performance.



Air Dynamics' sanding booth with source capture ActiveWall dust collector.