



Case Study

Designing a Fire Retardant Duct Wrap for HVAC Systems in Response to Regulatory Changes

Needs Assessment & Solutions Summary

A leading HVAC manufacturer in the commercial, industrial, and residential markets faced a critical challenge when regulatory changes rendered their existing foam fire retardant material noncompliant. This regulatory shift necessitated a solution that met UL 181 standards for fire retardancy while maintaining system performance.

Great Lakes Filters collaborated closely with the client to design a custom fire-retardant material capable of wrapping existing ductwork. This new solution improved safety and reduced operational noise, ensuring compliance and enhancing the product's marketability. By leveraging innovative material treatments and advanced manufacturing techniques, Great Lakes Filters delivered a solution that balanced performance, compliance, and scalability.

The project outcome ensured the client maintained production continuity, enhanced system performance, and adhered to updated regulations without disrupting their supply chain.

Project Specifications

- ⚙️ **Client:** HVAC manufacturer (commercial, industrial, and residential markets)
- ⚙️ **Application:** Fire-retardant duct wrap for HVAC systems
- ⚙️ **Key Challenges:**
 - ✓ Noncompliance due to obsolete foam fire retardant material.
 - ✓ Strict regulatory requirements (UL 181).
 - ✓ Need to maintain system safety and reduce noise without compromising material durability.





Solution Design

To address these challenges, Great Lakes Filters developed a bromine-free, fire-retardant material with optimized strength and acoustic properties. Key components of the solution included:

- ⚙️ **Custom Fire Retardant Treatment:** Developed a bromine-free formula to meet UL 181 standards.
- ⚙️ **Enhanced Material Strength:** Designed to withstand operational stress while maintaining flexibility.
- ⚙️ **Noise Reduction Features:** Engineered material properties to minimize system noise.

Applications & Capacity

- ⚙️ **Applications:** Fire-retardant duct wrap for HVAC systems used in commercial, industrial, and residential settings.

Potential Industries



HEALTHCARE

Fire-safe and noise-reducing duct wraps for hospitals and clinics.



HOSPITALITY

Enhanced HVAC safety and acoustic performance for hotels and restaurants.



EDUCATION

Compliance-driven HVAC solutions for schools and universities.



MANUFACTURING

Industrial facilities requiring fire-retardant HVAC systems.



DATA CENTERS

Ensuring safety and system reliability in critical cooling environments.



Manufacturing Details

MATERIAL SOURCING:

Selected high-durability base materials compatible with fire-retardant treatments.



FIRE RETARDANT APPLICATION:

Applied a bromine-free fire retardant treatment tailored for compliance with UL 181.



FABRICATION:

Produced the material in roll form for easy integration into existing manufacturing lines.



QUALITY CONTROL MEASURES:

Conducted UL 181 fire resistance and tensile strength tests.
Verified material consistency and uniformity across production batches.
Maintained comprehensive documentation, including Material Safety Data Sheets (MSDS).



Quality Control Highlights

Great Lakes Filters implemented rigorous quality control protocols to ensure the material met the client's requirements:

- ➡ **UL 181 Testing:** Verified compliance with fire resistance and strength standards.
- ➡ **Material Uniformity:** Ensured consistency in fire retardant application and roll dimensions.
- ➡ **Fit Validation:** Confirmed seamless integration with existing ductwork systems.



Value Delivered

- ➔ **Regulatory Compliance:** Enabled the client to meet updated UL 181 standards for fire retardancy.
- ➔ **Enhanced Safety:** Improved fire resistance for end-user systems.
- ➔ **Noise Reduction:** Added acoustic benefits for quieter HVAC operation.
- ➔ **Seamless Transition:** Maintained production continuity despite regulatory changes.

This project demonstrates Great Lakes Filters' expertise in developing innovative, customized solutions for complex regulatory and operational challenges. By designing a new fire-retardant material tailored to the client's requirements, Great Lakes Filters ensured compliance, improved system performance, and supported scalable production needs.

Contact Great Lakes Filters

Need assistance in maximizing manufacturing efficiencies to ensure quality and optimize costs? Call or email us today and one of our skilled team members will lead the way. (800) 521-8565 ~ info@acmemills.com