

# CASE STUDY

## Building by Daman

### Dubai Skyscraper Relies On AeroSeal For Energy Efficiency & HVAC Performance

From the start, the Building by Daman was to stand out as an architectural marvel among a cityscape that was already a testament to man's limitless achievements in building design and construction. Located in the heart of the United Arab Emirates in Dubai, the structure consists of two intertwining towers; one twenty stories tall, filled with offices and hotel amenities, and a second skyscraper consisting of sixty-five floors of deluxe apartments and a 300-room hotel.

#### Complex Duct System Leads to Complex Problems

The magnificence of the building's interlocking towers is matched only by the complexity of the massive duct system servicing the interconnected structures. Like a colossal highway connecting dozens of mechanical systems to points throughout the building, the new ductwork plays an instrumental role in helping engineers achieve a gold standard level of energy efficiency and performance.

So it was with no small amount of consternation that, on the cusp of the building's grand opening, engineers learned that much of the newly installed ductwork was leaking 30% or more of the air being transported from the HVAC system to its intended destinations. These leaks not only represented a massive amount of wasted energy but they also severely crippled the system's ability to adequately deliver comfort and provide adequate ventilation.

Remedying the problem via traditional manual sealing methods was out of the question. Now hidden behind miles of wiring, pipes, drywall and other obscuring infrastructure, accessing the ductwork to reach the leaks would have required a near-total demolition of much of the newly constructed interior. The time and costs involved in such an endeavor are unimaginable.

#### Duct Sealing Solution

Fortunately, word had already begun to spread throughout Dubai's contracting community about a similar problem solved during the construction of a new state-of-the-art medical facility located in the United Arab Emirates. Faced with a similar dilemma, engineers used AeroSeal duct sealing technology. Unlike other duct sealing methods, the AeroSeal technology works from the inside of the ducts to find and seal leaks.

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### PROJECT OVERVIEW

**BUILDING**

Building by Daman

**LOCATION**

Dubai, UAE

**AEROSEAL CONTRACTOR**

Firestop Middle East

**CONTRACT ENGINEER**

Habtoor Leighton Group

**BEFORE AEROSEAL**

4,500 CFM of leakage

**AFTER AEROSEAL**

315 CFM of leakage

**RESULTS**

98.3% average leakage reduction and all buildings passed inspection, allowing construction to resume

This inside-out approach provides easy access to the entire duct system. The sealant is blown into the duct interior where it can easily travel unobstructed throughout the ductwork. The particles of sealant remain suspended in air until they come in contact with a leak. There they bond around the edges of the leak and then to other sealant particles until the entire hole is sealed shut.

Habtoor Leighton Group (HLG), the general contractors assigned to remedy the situation, called in the AeroSeal experts at Firestop Middle East to assess the situation and perform a pilot project aimed at demonstrating the efficacy of the aerosol-based sealing technology.

Initial testing measured leakage rates of 800 cfm to 1,000 cfm in one of the shafts that serviced eighteen floors of the building. Firestop quickly prepped the designated portion of ductwork, hooked up the computerized sealing equipment to

the ductwork and within twenty minutes, reduced duct leakage from 900 cfm down to 63 cfm – a 93% reduction. Similar results were obtained in four additional sections of ductwork.

## Results

With the great success demonstrated during the pilot project, HLG authorized Firestop to seal an additional 19 duct systems. Completed over a two-week period, each project recorded similar results with leakage rates being reduced from an average of 30% down to 5% or less.

The Building By Daman project was completed on schedule and today stands as a proud testament to architectural achievement. And with the help of an innovative approach to duct sealing, it also serves as a model of energy efficiency and building performance.



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