aeris™ ENVIRONMENTAL

Case Study

Antimicrobial Duct Coating
Brisbane Public Hospital

Hospital (QLD Australia)

Case Study

Summary

A Queensland public hospital faced severe microbial contamination in HVAC ductwork, threatening patient safety. AerisGuard™ Duct Coating & Sealant provided comprehensive remediation with greater than 10 years mould protection. The ultra-low VOC formula enabled continuous hospital operations, with safe re-occupancy within 2 hours, eliminating costly shutdowns while ensuring superior air quality.

Image 1 - AHU4.1 Ductwork Before

Image 2 - AHU4.1 Ductwork After

Site

This remediation project was conducted at a major public hospital facility in East Brisbane, Queensland, Australia. As a high-traffic healthcare environment serving thousands of patients annually, the facility required a solution that would address severe microbial contamination while maintaining continuous hospital operations.

The critical nature of healthcare environments demands exceptional indoor air quality standards. With immunocompromised patients, surgical suites, intensive care units, and general wards all depending on the HVAC system, any disruption to air quality or operational downtime poses significant health and operational risks. This facility required a remediation approach that could deliver lasting results without compromising patient care or requiring extended facility shutdowns.

The hospital's HVAC system serves multiple wings including patient care areas, operating theatres, and administrative spaces, making the integrity of the ductwork vital to infection control protocols and overall patient safety.

Pro-Treatment Duct Conditions

Prior to treatment, comprehensive air quality testing and visual inspection revealed severe microbial contamination throughout the HVAC ductwork system. The before-treatment images (Images 1 and 3) document the extent of the deterioration:

Visible Contamination:
Heavy accumulation of dust, dirt, and organic debris along duct surfaces
Dark discolouration indicating extensive mould growth throughout the duct interior
Compromised insulation showing signs of moisture damage and microbial colonisation
Visible biofilm development on duct linings, creating ideal conditions for bacterial and fungal proliferation

Microbiological Concerns:
The contaminated ductwork created a distribution system for:
Airborne bacteria that could spread hospital acquired infections (HAIs)
Fungal spores including aspergillus species, particularly dangerous for immunocompromised patients
Particulate matter that exacerbated respiratory conditions
Odour-causing microorganisms affecting indoor environmental quality

System Performance Issues:
Reduced airflow efficiency due to debris accumulation
Increased energy consumption as the system worked harder to maintain temperature
Filter lifespan drastically reduced by the contamination load
Risk of cross-contamination between hospital zones through the HVAC system

The deteriorated state of the ductwork posed serious infection control concerns in a healthcare setting where air quality directly impacts patient outcomes, recovery times, and overall safety.

Methodology

The remediation followed a systematic, multi-phase approach designed to ensure complete decontamination and long-term protection:

Phase 1: System Isolation & Pressurisation
HVAC units were taken offline and isolated from hospital operations

Negative air pressure systems were established to contain contaminants during the cleaning process
This containment prevented any disturbed microbial material from entering occupied hospital spaces
Strategic staging allowed sections of the hospital to maintain climate control during remediation

Phase 2: Mechanical Cleaning
The LEFA (Low Emission Flexible Agitation) system was deployed for deep mechanical cleaning
This advanced cleaning method physically removes debris, biofilm, and contamination without introducing harsh chemicals
Mechanical sweeping and vacuuming eliminated loose particulates and organic material
All dislodged contamination was captured using HEPA filtration systems

Phase 3: Chemical Pre-Treatment
AerisGuard™ Surface Cleaner was applied to address embedded organic contamination
AerisGuard™ Heavy Duty Degreaser was utilized in areas with oil or grease buildup that could compromise coating adhesion
These pre-treatment products ensured optimal surface preparation for the final protective coating
Surfaces were inspected to meet NADCA "clean" standards before coating application

Phase 4: Surface Preparation & Drying
All duct surfaces were verified to be clean, dry, and free from visible debris
Damaged insulation areas were identified for enhanced coating application
Environmental conditions (temperature, humidity) were optimized for coating performance
Residual dust levels were tested to ensure compliance with industry standards

Phase 5: AerisGuard™ Duct Coating & Sealant Application
Product was thoroughly mixed using electric drill with paintstirrer attachment for 10+ minutes to achieve consistent viscosity
Application performed using high-pressure airless spray equipment (minimum 2,800 PSI capacity)
Multiple thin coats applied rather than single thick coat, allowing proper drying between applications Application rate adjusted based on surface condition: 0.7-2.5 L/m^2 (standard surfaces), higher rates for damaged insulation
Particular attention paid to sealing compromised lining and surface imperfections
Black pigment option utilized in specific areas to provide visual discretion while maintaining antimicrobial properties

Phase 6: Curing & System Restart
Coating allowed to cure with proper ventilation maintained throughout
Visual inspection conducted to ensure complete, uniform coverage
Photographic documentation captured post-application condition
HVAC systems brought back online within 1-2 hours of coating completion
No disruption to hospital operations or patient care during restart phase

This comprehensive methodology ensured not only immediate remediation but also long-term prevention of microbial recolonisation.

Benefits of AerisGuard™ Duct Coating & Sealant

Unmatched Mould Protection
Provides 10-year warranty against mould, mildew, and bacteria. Can assist in the reduction of healthcare-associated infections, protects immunocompromised patients, ensures regulatory compliance, and decreases liability exposure in healthcare facilities.

Ultra-Low VOC, Minimal Odour Formula
Water-based formulation allows continuous hospital operations during treatment. Safe re-occupancy within 2 hours eliminates patient relocation costs. Successfully applied in fully functioning hospital wards without evacuation.

Versatile Surface Adhesion
Adheres to all HVAC surfaces: fibreglass, sheet metal, flexible ductwork, duct board, and insulation. Eliminates multiple product requirements, ensuring comprehensive protection across diverse duct construction types.

Rapid Drying & Immediate System Restart
HVAC systems resume operation within 1 hour, minimising disruption to operating rooms and laboratories. Maintains infection control protocols while reducing contractor time in active patient areas.

Crack-Resistant, Durable Performance
Remains flexible despite temperature fluctuations, airflow, and vibration. Ensures antimicrobial protection throughout 10-year warranty without deterioration, cracking, or maintenance requirements for lasting performance.

Extended Filter Life & Energy Efficiency
Seals duct surfaces, extending filter lifespan and reducing replacement costs. Eliminates air leaks, improves airflow, and lowers energy consumption through optimized system performance and efficiency.

Regulatory Compliance & Safety Certifications
Meets UL-181.11-2013 Burn Test, AS/NZS 1530.3-1999 Fire Test, NSF certification, non-hazardous GHS classification. All ingredients listed in AICS, TSCA, and REACH inventories.

Long-Term Cost Savings
Ten-year protection eliminates repeated remediation, reduces emergency costs, minimises maintenance expenses, avoids facility shutdown losses, and protects against litigation - delivering substantial financial benefits throughout warranty.

Results

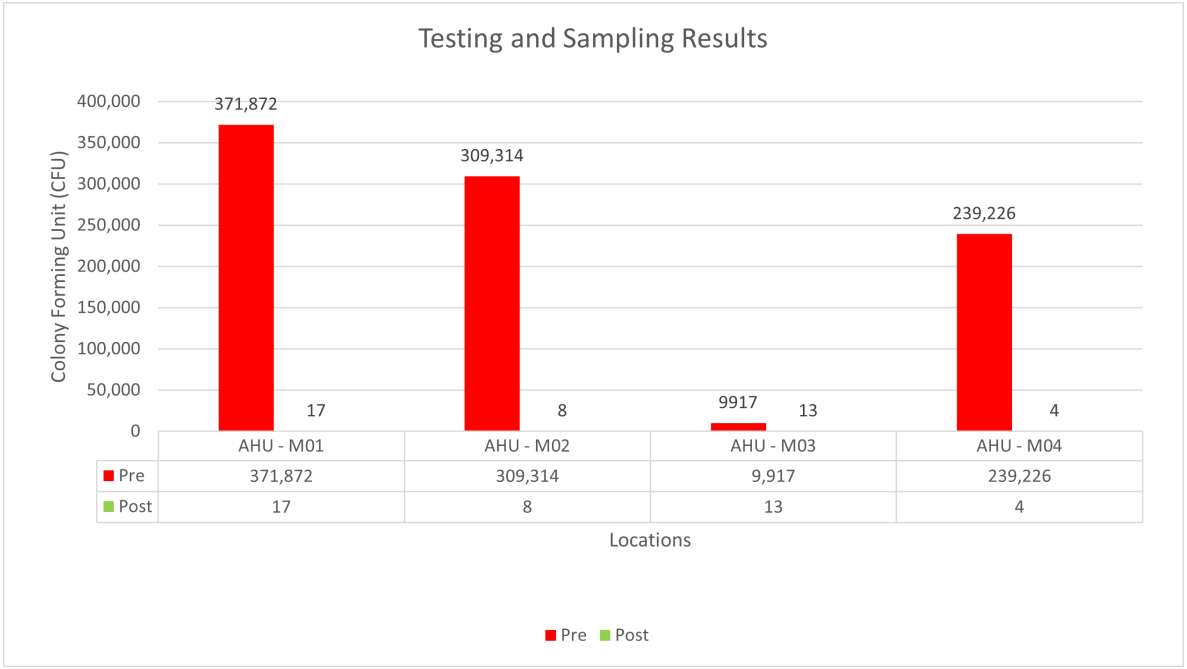
Location Information	Pre (CFU)	Mould Type	Post (CFU)	Mould Type	Reduction Percentage
AHU - M01	**371,872**	Cladosporium	**17**	Aspergillus/Penicillium	99.99%
AHU - M02	**309,314**	Cladosporium	**8**	Ascospores	99.99%
AHU - M03	**9,917**	Cladosporium	**13**	Aspergillus/Penicillium	99.86%
AHU - M04	**239,226**	Cladosporium	**4**	Aspergillus/Penicillium	99.99%

Image 3 - AHU4.1 Ductwork Before

Image 4 - AHU4.1 Ductwork After

Image 5 - AHU4.1 Cushion Head Box Before

Image 6 - AHU4.1 Cushion Head Box After



AerisGuard™ Duct Coating & Sealant transformed critically contaminated ductwork into a pristine, protected system. The hospital achieved immediate air quality restoration with HVAC restart within one hour, enabling continuous patient care operations throughout the remediation process.

Testimonial

At **Efficient Hygiene Services**, we work across a wide range of healthcare, commercial, and critical environments and regularly apply antimicrobial coatings and duct sealants as part of our HVAC hygiene works. Aeris Antimicrobial Duct Sealant has become one of the products we rely on most.

The product is highly effective at encapsulating residual particulate and helping inhibit microbial regrowth within supply air ductwork. We have consistently achieved strong outcomes across multiple projects, particularly in live and sensitive environments where hygiene control is critical.

From a commercial perspective, Aeris Antimicrobial Duct Sealant is significantly more cost-effective than many comparable products on the market, without compromising performance. This allows us to deliver high-quality results for our clients while remaining commercially competitive on larger projects.

The usability of the product is excellent. It is easy to apply, dries quickly, has a low odour profile, and can be safely used in live environments with minimal disruption to occupants. These factors make it well suited to hospitals and occupied buildings where shutdowns are limited or not possible.

Overall, Aeris Antimicrobial Duct Sealant is a product we genuinely trust and continue to specify regularly. It has become a core part of our HVAC hygiene offering and is one of the most frequently used products across our projects.

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