



# APPLICATION GUIDE

## HEALTHCARE FACILITIES

Hospitals play a critical role in public health, providing care and treatment to those in need. One of the most significant challenges faced by healthcare facilities is the prevention of hospital-acquired infections (HAIs). This application guide focuses on the use of Photocatalytic Oxidation (PCO) technology in hospitals to enhance air quality and reduce the risk of HAIs.

### Understanding PCO Technology

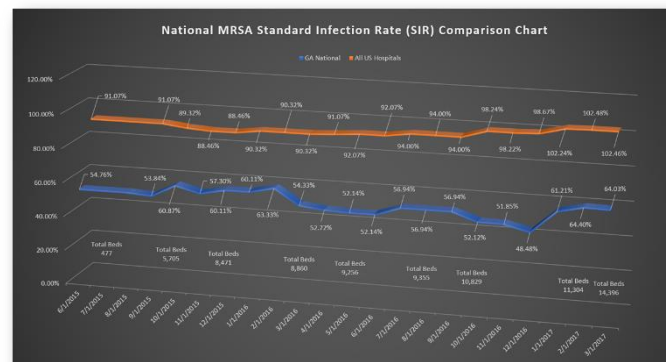
Photocatalytic Oxidation (PCO) is an advanced air purification technology that utilizes hydroxyl radicals to make bacteria, viruses, and mold non-viable with exceptional efficiency. PCO systems integrate with the HVAC (Heating, Ventilation, and Air Conditioning) systems in hospitals to enhance air filtration and purification.

### Benefits of PCO in Hospitals

PCO systems significantly improve normal filtration in the HVAC system by inactivating bioaerosols with a very high single-pass efficiency, ensuring cleaner and safer air for patients and staff. Despite the use of high-efficiency filters in hospitals, the small size of viruses, bacteria, and droplet nuclei can potentially bypass filtration. PCO technology complements filtration by eliminating viable microorganisms, reducing the risk of HAIs.

### Addressing the Economic Impact

Hospital-acquired infections result in significant economic costs, including prolonged patient stays, additional treatments, and potential legal liabilities. Hospitals face penalties for HAIs in the form of reduced payment on Medicare and Medicaid insurance claims. The emergence of drug-resistant bacteria compounds the seriousness of HAIs for medical professionals. PCO technology offers an added layer of defense by reducing the microbial load in hospital environments, helping to combat drug-resistant strains. Implementing PCO systems can help hospitals maintain compliance and protect their financial stability. In the chart in FIGURE 1, the orange line shows the average Standard Infection Ratio (SIR) of all US Hospitals as reported from the Centers for Medicare and Medicaid. The blue line represents the average SIR for hospitals that have Genesis Air technology installed. The average reduction in hospitals is greater than 25 percent.



**FIGURE 1** – Comparison of Standard Infection Rate (SIR)

### Additional Benefits of PCO Systems

PCO systems also excel at cleaning contaminant odors, such as those from helicopter and ambulance exhaust, which are introduced into the HVAC system as part of the required outside air. The combination of bioaerosol control and gas phase odor control ensures the best indoor air quality for patients and staff.

### Case Study

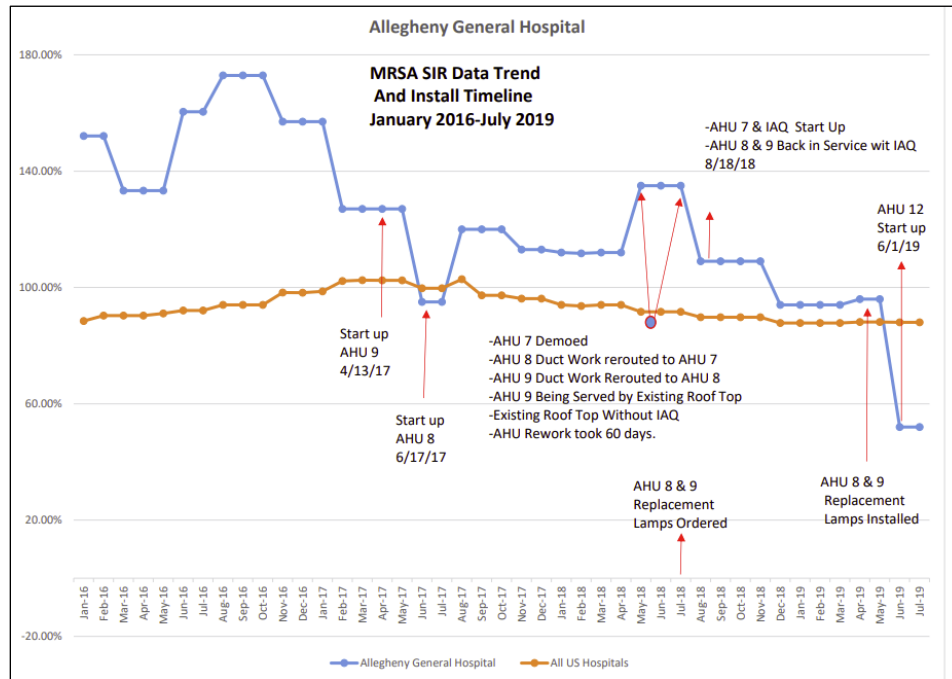
Alleghany General Hospital in Pittsburgh, PA installed the 4S Centerpoint Technology PCO system during a mechanical renovation in 2016 through 2019. In the chart in Figure 2, the reduction in Standard Infection Ratio (SIR) in mid 2017 is correlated with the startup of the air handling unit serving the operating rooms. In the next phase of the project, the ductwork modifications needed to facilitate the remaining mechanical renovation had the surgery areas now being fed from an existing rooftop unit without the 4S Centerpoint PCO system and the SIR increased again.



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When the Allegheny General project was completed and the PCO system back in service with new lamps installed, the SIR for the facility had been reduced nearly 100 percentage points from the original value in 2016.



**FIGURE 2 – Allegheny General SIR**

### Installations

Allegheny Health, Pittsburgh  
Atlanta Medical Center (TENET) Atlanta Georgia  
Baylor Medical In vitro Clinic, Dallas, Texas  
Brookwood Medical Center, Birmingham, Alabama  
CCMC Ambulatory Service Center, Bloomfield, CT  
Citrus Memorial Health Center, Inverness, Florida  
Citizens Medical Center, Wichita, KS  
Conroe Regional Hospital, Conroe, TX  
Del Ray Medical Center, Del Ray Florida  
Florida Hospital, APOKA FL  
Forbes Regional Hospital ER, Pittsburgh, Pennsylvania  
Gunderson Lutheran Hospital, Lacrosse, Wisconsin  
Integrated Cancer Center, El Paso, Texas

John Muir Hospital, Oakland, California  
Kingsbrook Medical Center, Brooklyn New York  
Las Cruces Surgical Center, Las Cruces, New Mexico  
Lahey Clinic, Boston, Massachusetts  
Mid Michigan Medical Center, Midland, Michigan  
M.D.Anderson Pavillion  
NE Alabama Medical Center, Anniston, Alabama  
New Albany Medical Center, Columbus, Ohio  
New York Presbyterian Hospital, New York NY  
St Christopher's Hospital For Children, Philadelphia  
Stanford Hospital, Stanford CA  
West Boca Medical Center, Boca Raton, FL  
West Virginia University Hospital, Morgantown, WV

### Conclusion

The implementation of PCO technology in hospitals is a proactive step toward enhancing air quality, reducing the risk of HAIs, and addressing the economic impact of healthcare-associated infections. By utilizing PCO systems, hospitals can create cleaner, safer environments for both patients and healthcare providers while potentially reducing the financial burden associated with HAIs. Furthermore, the removal of contaminant odors is an added bonus that contributes to a more pleasant hospital environment.