

Lloyd's of London Evaluation of CIBSE Covid-19 Mitigation Guidance vs. REME-LED™ Active Air Purification

The purpose of the Lloyd's of London study was to evaluate RGF's REME LED™ active air purification technology with respect to the new CIBSE commercial building COVID-19 ventilation guidance, specifically:

- a) Actual space disinfection performance vs. hydrogen peroxide fogging
- b) Cost of compliance with CIBSE COVID infection control guidance - capital and ongoing energy costs
- c) Recurrent fogging efficacy and costs

The following is a summary of a case study compiled by Better Indoors using information generated by independent, third party testing at the customer location.

Background

The CIBSE (Chartered Institution of Building Services Engineers) COVID-19 ventilation guidance around outside air ventilation in commercial buildings clearly states that the benefit to public health outweighs the reduction in energy efficiency when extending ventilation operation times and switching off recirculation control strategies.

The Lloyd's of London (Lloyd's) study shows that following this guidance does not come without a heavy financial burden in an already difficult economic climate. Energy costs increase, maintenance costs increase, and the overall lifespan of HVAC plant and associated equipment reduces considerably, meaning replacement of large HVAC equipment will be required sooner than desired. Also, it should be noted it may not be possible to reconfigure many HVAC systems to meet the recommendations as they were specified and installed during a time of less stringent ventilation requirements.

Following the guidance may help reduce the presence of airborne virus to a certain extent by air dilution but the virus is not destroyed in this process, so if the extra capacity exists, the time and/or rate of air change alone will not provide a particularly effective means of preventing person-to-person transmission via airborne routes and none whatsoever for surface transmissions of infectious pathogens.

Lloyd's evaluated REME LED™ (HALO-LED™) an in-duct, active air purification technology developed by RGF Environmental whilst recognising and following CIBSE ventilation guidance. HALO-LED™ meets UL 2998 zero ozone emission standard.

The study demonstrates not only the comparative effectiveness of the HALO-LED™ but also the major savings achievable by incorporating active air purification technology into an existing HVAC system. The report states that the savings are enormous and will be replicated on a similar scale for other businesses with building wide HVAC strategies. Lloyd's projected a 30% monthly reduction in energy costs alone and more than 90% annualised cost (capital cost of HALO-LED™ versus ongoing cost of fogging). If we calculate the costs of increased maintenance for the HVAC plant, the savings would be even greater. For Lloyd's return on their capital investment across the entire estate will be realised within just a few months.

Study Design

The test site for the evaluation of the HALO-LED™ was the Lloyd's of London building in City of London, UK. The building site

was reviewed to determine the design and commissioning ventilation rates. In this instance, HALO-LED™ units were installed in the main branches of the supply ductwork that serve the office spaces. This installation location maximises the airflow scalability designed into the products and therefore offers the best possible value and return on investment.

The Lloyd's of London report states that HALO-LED™ mimics Earth's natural air cleaning processes. Natural oxidizers are released into the air stream and reach every cubic centimeter of the indoor space. Airborne oxidizers continuously break down and destroy viruses/microbials in the air and on surfaces and then, revert to water vapor and oxygen. This process is essentially the opposite of passive approaches that require filtration or treatment with germicidal UV-C light. The air does not need to be passed through the device to be treated, rather it actively treats all the air and all the surfaces in every part of the indoor space simultaneously and continuously. It is impossible for any passive technology to work in the same manner. These are the fundamental differences between active and passive technologies, and they explain why it is important to understand the differences in how each the two types of IAQ technologies work.

Results

ATP testing was conducted throughout the building to determine the efficacy of the HALO-LED™ on one floor, vs hydrogen peroxide fogging on another floor. The size and layout of the floors were almost identical, and the air flow rates were also similar and unchanged from their pre-COVID commissioned settings. The study required an independent third-party analysis of the microbial counts of both fogging and active air purification over the agreed duration, following the fogging treatment and the installation of the air purification system. Also note, fogging uses approximately 5% hydrogen peroxide in most cases, which requires occupants to vacate the treatment area for several hours, whereas active air purification contains levels of Hydrogen Peroxide at around 0.02ppm, which are effective against microbes yet safe for human presence, therefore productivity is not affected as it is with concentrated hydrogen peroxide fogging.

The testing revealed a sharp decrease in the microbial count after the fogging treatment and then a strong upward trend in the hours and days following treatment. Due to the high cost and requiring the area to be vacated, it would usually be another 4 weeks before treatment is reapplied.

Following the installation of HALO-LED™, it yielded a drop in microbial counts within 48 hours of installation, which in stark contrast to the fogging, continued to fall and remained at a stable, low count continuously afterwards.

The report concludes by stating that due to the efficacy of the technology and the nature of HALO-LED™ vs the temporary effects of fogging which lessen over time, "the environment is safer, and the threat of virus transmission is reduced dramatically. By installing this technology, we are able to offer an effective low cost, low energy alternative".



James Marsden, Ph.D.
Executive Director – Science & Technology
RGF Environmental Group Inc.
drjmarsden@rgf.com

FOR MORE INFORMATION:
Sam Rochaix (Sales Director)
The Clean Air Company
E: sam@cleanairco.com.au
PH: (02) 8034 0598 / M: 0506 585 402