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Medical Dental Systems

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Scientific Summary

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Scientific Summary: NHS-UK UVC Air Cleaning Guidance & Sterybox Report

Sterybox Device Characteristics

Sterybox is an advanced UV-C air disinfection device designed for use in high-risk environments, such as hospitals, laboratories, and offices. It utilizes a patented **UV-CHRIS (Ultraviolet High Reflecting Irradiation Coil System)**, which amplifies the UV-C exposure up to **400%** compared to standard linear flow devices.

- **Efficiency**: Up to **99.99% reduction** in airborne contamination within **30 minutes**.
- **Technology**: Employs **254 nm UV-C radiation** in a mirrored stainless steel labyrinth for enhanced disinfection.
- **Safety**: No ozone emission, enclosed UV-C radiation, and automatic deactivation upon opening.
- **Maintenance**: UV-C lamps require replacement after **8,000 operational hours**.
- **Certifications**: CE-certified as a **Class I Medical Device**, compliant with **UNI EN ISO 13485:2021**.
- **Deployment**: Suitable for **hospitals, clinics, dental offices, clean rooms, offices, schools, and gyms**.

Introduction

Ventilation is a fundamental aspect of infection control in healthcare settings. The NHS England Technical Bulletin (NETB 2023/01B) provides guidelines for **UV-C air cleaning devices** in hospitals and healthcare environments, emphasizing their role in reducing airborne pathogen transmission. UV-C devices, such as Sterybox, present a highly effective alternative or complement to **mechanical and natural ventilation** in improving air quality.

UV-C Germicidal Effects

UV-C radiation, specifically at **254 nm**, is widely recognized for its germicidal properties, effectively inactivating microorganisms, including bacteria, viruses, and spores. NHS standards highlight the necessity of proper air circulation within UVC devices to optimize exposure time and microbial deactivation. Sterybox aligns with these principles by employing a **highly reflective irradiation system**, ensuring maximal air sterilization efficiency.

Scientific Validation of Sterybox Performance

Independent laboratory tests confirm the effectiveness of Sterybox in reducing airborne pathogens:

- **Bacteria & Spore Reduction (Biolab Tests)**:
  - **10 min:** 80% reduction
  - **20 min:** 95% reduction
  - **30 min:** 99.99% reduction
- **Functional Tests Against Pathogens**:

  - Successfully eliminated **Staphylococcus aureus, Pseudomonas aeruginosa, Salmonella bony, Listeria innocua, Aspergillus niger, and Candida albicans** within **12 minutes**.
- **Hospital and Dental Office Evaluations**:
  - **Hospital Setting:** 99.9% bacterial reduction in **30 minutes**.
  - **Dental Clinics:** 98% airborne bacterial reduction in **20 minutes**.
- **Ozone Emission & Noise Safety**:
  - Ozone concentration below **100 µg/m³** (negligible levels).
  - Noise levels: **52.4 dB at 1m, 47.7 dB at 5m** (compliant with healthcare standards).

Engineering & Safety Considerations

Both the NHS guidance and Sterybox scientific validation emphasize the importance of safety and compliance with international standards:

- **Containment of UV-C Radiation**: Ensuring no direct exposure to UV-C light for occupants.
- **Electrical and Optical Safety**: Compliance with **IEC 60601-1 & Low Voltage Directives**.
- **No Ozone Emission**: Sterybox's UV-C lamps do not generate harmful ozone.
- **Airflow & Placement Considerations**: Proper device positioning enhances efficiency and prevents air stagnation.
- **Regular Maintenance & Validation**: NHS recommends **annual validation** and in-time replacement of UV-C lamps, a practice aligned with Sterybox maintenance guidelines.

Conclusion

Sterybox demonstrates full compliance with NHS air cleaning recommendations, offering a **scientifically validated, efficient, and safe** solution for airborne infection control. The device's **high-reflectance UV-C system**, coupled with its **clinical validation** across multiple environments, positions it as an ideal choice for **hospitals, medical facilities, and other high-risk settings** requiring enhanced air disinfection.

By integrating NHS engineering standards with Sterybox's **certified disinfection technology**, healthcare facilities can significantly reduce the risk of airborne infections while ensuring a **safe and comfortable** environment for patients and staff.

Sources

- NHS Estates Technical Bulletin (NETB 2023/01B): application of ultraviolet (UVC) devices for air cleaning in occupied healthcare spaces: guidance and standards. Date published: 9 May, 2023 - Date last updated: 2 October, 2023
- Scientific Report Summary on Sterybox 2025