

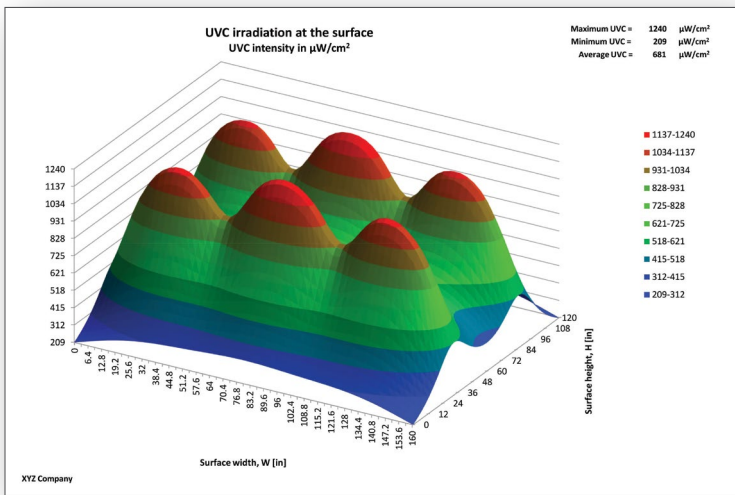


COMMERCIAL SERIES

BlueCalc™ Surface & Air Software-based UVGI System Configuration Sizing Programs



The key to the successful application of UVGI technology to any commercial project is determining the correct number, size and placement of UV-C lamps within the HVAC system for optimum effectiveness. To streamline this process Fresh-Aire UV® has introduced **BlueCalc™**, a suite of software applications that use advanced lighting algorithms to determine optimal UV-C coverage based on the project's specific HVAC system design parameters.



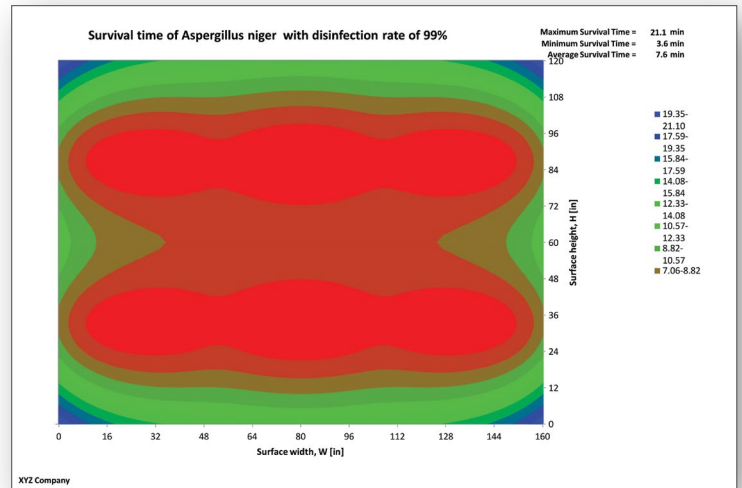
BlueCalc™ Advantages

- Accurately models UV-C Irradiation on coils, in air ducts and other surfaces
- Calculates airborne & surface microbe inactivation rates
- Includes Fresh-Aire UV proprietary UV-C Factor
- Easy to use online form
- Results based on specific HVAC system parameters
- Report includes charts suitable for presentations
- Comprehensive analysis unique in the UVGI industry
- Accounts for duct material reflectivity, air velocity, remaining lamp life, supply or return side coil placement, duct shape, and other parameters.
- Cost savings and ROI calculations available

Comprehensive & Easy To Use

Fresh-AireUV® provides a convenient and free online interface which building managers, engineers and consultants can use to input information about the size, dimensions, capacity and other parameters of the HVAC system. Fresh-AireUV® technicians then use this information as the basis for sizing simulations using **BlueCalc™ Surface** and **BlueCalc™ Air** UVGI sizing programs.

The analysis ensures that an engineer's UV fixture configuration will be effective for optimum microbe disinfection and operate and will meet the requirements of proposed ASHRAE SPC 185.1 and 185.2 standards. Once the size, number, and placement of UV-C lights is determined by BlueCalc™, it is a simple matter of quoting the number of UV systems required to complete the commercial UVGI project.



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BlueCalc™

Analysis & Report

The free analysis & report generated by our **BlueCalc™** Software shows the number and placement of UV-C lamps needed to achieve the results generated from the **BlueCalc™** Analysis & Report Request Form. It also contains charts and graphs representing data such as the estimated irradiation pattern, placement of UV lamps within the HVAC system, microbial inactivation rates, etc. which are suitable for engineers and consultants to include in project proposals.



BLUECALC™

SURFACE ANALYSIS - REPORT

Customer / Project : XYZ Company

<p>Surface Data</p> <p>Width 160 in Height 120 in Distance from Surface 12 in Number of Rows 2 Number of Lamps per Row 3 Total number of UV lamp fixtures 6</p> <p>Irradiation Data</p> <p>UVC factor 2 Minimum Irradiance on the Surface 209 µW/cm² Average Irradiance on the Surface 681 µW/cm² Maximum Irradiance on the Surface 1240 µW/cm²</p> <p>Microbe Survival Time after 18000 hours of operation</p> <p>ASPERGILLUS NIGER Disinfection rate 99 % Maximum survival Time 21.1 min Average Survival Time 7.6 min Minimum Survival Time 3.6 min</p>	<p>UVGI Lamp Data</p> <p>Number of lamps 6 Lamp Model TUVCL-246-HO UVGI Power per Lamp 34 W Lamp Length 1148 mm Lamp Diameter 15 mm Electrical Power per Lamp 100 W Electrical Power (Total) 600 W Reflector/Shield No Lamp position DOWNSTREAM</p> <p>Installation (row height and column left edge)</p> <table border="1" style="font-size: small;"> <tr> <td>Row 1</td> <td>32.72 in</td> <td>Column 1</td> <td>4.06 in</td> </tr> <tr> <td>Row 2</td> <td>87.26 in</td> <td>Column 2</td> <td>57.40 in</td> </tr> <tr> <td></td> <td></td> <td>Column 3</td> <td>110.75 in</td> </tr> </table>	Row 1	32.72 in	Column 1	4.06 in	Row 2	87.26 in	Column 2	57.40 in			Column 3	110.75 in
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Irradiation at the surface

Lamp Installation Positioning

Disclaimer: The information and the analysis of this report is proprietary and confidential. Due to the fact that the data used in this analysis is supplied by the end user who takes responsibility for its accuracy, FreshAir UV does not make and expressly disclaims any representations or warranties as to the completeness, accuracy or usefulness of the report. FreshAir UV does not warrant that the use of such information will not infringe any third-party rights, nor does FreshAir UV assume any liability for damages or costs of any kind that may result from use of such information. Data contained in this BlueCalc sizing is subject to change without notice.

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BlueCalc™ Surface analysis report

BLUECALC™

AIR DISINFECTION ANALYSIS - REPORT

Customer / Project : XYZ Company

<p>Duct Data</p> <p>Duct Width 24 in Duct Height 24 in Airflow 2000 CFM Air Velocity 500 ft/min Duct Wall Material Galvanized duct - rough</p>	<p>UVGI Lamp Data</p> <p>Model TUV-ADS-232Q-HO Number of Units 1 Setup type for multiple units n/a Number of Lamps per Unit 4 Lamp Length 859 mm UVGI Power per Lamp 28 W Electrical Power per Lamp 90 W Electrical Power (Total) 320 W Teflon coating No</p>	<p>Inactivation (sterilization) rates after 18000 hours</p> <table border="1" style="font-size: x-small;"> <thead> <tr> <th>Microorganism</th> <th>Minimum</th> <th>Average</th> <th>LOG Average</th> </tr> </thead> <tbody> <tr> <td>Mycoplasma</td> <td>99.93%</td> <td>> 99.99%</td> <td>> 4</td> </tr> <tr> <td>Tuberculosis</td> <td>99.94%</td> <td>> 99.99%</td> <td>> 4</td> </tr> <tr> <td>Adenovirus</td> <td>85.15%</td> <td>95.48%</td> <td>1</td> </tr> <tr> <td>A virus</td> <td>98.37%</td> <td>99.87%</td> <td>2</td> </tr> </tbody> </table>	Microorganism	Minimum	Average	LOG Average	Mycoplasma	99.93%	> 99.99%	> 4	Tuberculosis	99.94%	> 99.99%	> 4	Adenovirus	85.15%	95.48%	1	A virus	98.37%	99.87%	2
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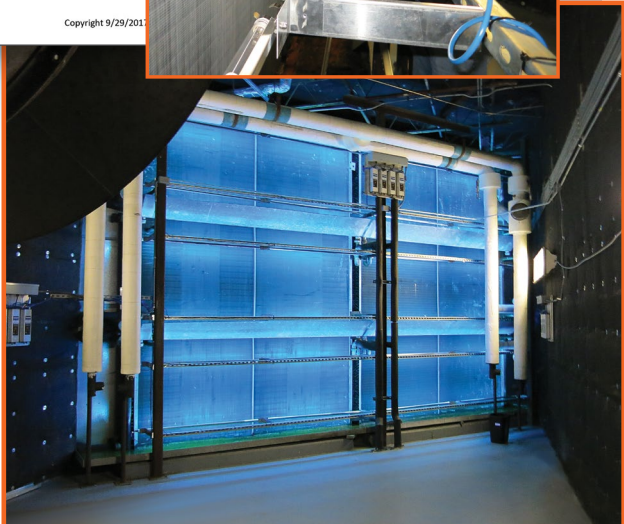
Heatmap: Inside the duct after 18000 hours

(Color scale: 0 to 24 µW/cm²)

(Note: Inactivation rates are based on a 4-log inactivation scenario but the exact prediction/model would be the UV disinfection analysis utilizes single stage decay data and equations. The information and the analysis of this report is proprietary and confidential. Due to the fact that the data used in this analysis is supplied by the end user who takes responsibility for its accuracy, FreshAir UV does not make and expressly disclaims any representations or warranties as to the accuracy or usefulness of the report. FreshAir UV does not warrant that the use of such information will not infringe any third-party rights, nor does FreshAir UV assume any liability for damages or costs of any kind that may result from use of such information. Data contained in this BlueCalc sizing is subject to change without notice.

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BlueCalc™ Air disinfection analysis report



Help Throughout The Design & Installation Process

Fresh-Aire UV® consultants work with building managers and engineers throughout the design and installation of the commercial UV-C system. This will provide you with all the information necessary to configure the best possible UVGI solution for your project and help resolve any technical issues that may come up.



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