

Verilux® Test Data and Efficacy

The following information provides test data to confirm the efficacy of Verilux® CleanWave® UV-C Sanitizing appliances. The “Industry accepted Kill Rate” data is first presented and then it is applied to each Verilux® CleanWave® item based upon the Independent Test results which then follow. These results confirm the UV-C spectral data and output of each of the respective appliances. The final report is the Independent Antimicrobial/Antibacterial Activity Test performed on 10 different organisms using the Verilux® CleanWave® VH01 UV-C Sanitizing Wand. This data confirms the effectiveness of this unique, proven and sustainable Verilux® chemical free sanitizing technology.

Page 2 Industry Accepted Kill Rate Chart for UV-C

Page 3 Kill Rate data by CleanWave® product

Page 4 Lab Test Data results for Verilux® CleanWave® Products

Page 12 Lab Test Results — Antimicrobial/Antibacterial Activity Test

Test Results of UV-C Light Eliminating H1N1 on Surfaces

Industry Accepted Kill Chart

Organisms:	$\mu\text{W-sec/cm}^2$ 90% Eliminated
BACTERIA	
Bacillus anthracis - Anthrax	4,520
Bacillus anthracis spores - Anthrax spores	24,320
Bacillus magaterium sp. (spores)	2,730
Bacillus magaterium sp. (veg.)	1,300
Bacillus paratyphusus	3,200
Bacillus subtilis spores	11,600
Bacillus subtilis	5,800
Clostridium tetani	13,000
Corynebacterium diphtheriae	3,370
Ebertelia typhosa	2,140
Escherichia coli	3,000
Leptospiranicola - infectious Jaundice	3,150
Micrococcus candidus	6,050
Micrococcus sphaeroides	1,000
Mycobacterium tuberculosis	6,200
Neisseria catarrhalis	4,400
Phytomonas tumefaciens	4,400
Proteus vulgaris	3,000
Pseudomonas aeruginosa	5,500
Pseudomonas fluorescens	3,500
Salmonella enteritidis	4,000
Salmonella paratyphi - Enteric fever	3,200
Salmonella typhosa - Typhoid fever	2,150
Salmonella typhimurium	8,000
Sarcina lutea	19,700
Serratia marcescens	2,420
Shigella dysenteriae - Dysentery	2,200
Shigella flexneri - Dysentery	1,700
Shigella paradysenteriae	1,680
Spirillum rubrum	4,400
Staphylococcus albus	1,840
Staphylococcus aerius	2,600
Staphylococcus hemolyticus	2,160
Staphylococcus lactis	6,150
Streptococcus viridans	2,000
Vibrio comma - Cholera	3,375
MOLD	
Aspergillus flavus	60,000
Aspergillus glaucus	44,000
Aspergillus niger	132,000
Mucor racemosus A	17,000
Mucor racemosus B	17,000
Oospora lactis	5,000
Penicillium expansum	13,000
Penicillium roqueforti	13,000
Penicillium digitatum	44,000
Rhisopus nigricans	111,000
PROTOZOA	
Chlorella Vulgaris	13,000
Nematode Eggs	4,000
Paramecium	11,000
VIRUS	
Bacteriophage - E. Coli	2,600
Infectious Hepatitis	5,800
Influenza	3,400
Poliovirus - Poliomyelitis	3,150
Tobacco mosaic	240,000
YEAST	
Brewers yeast	3,300
Common yeast cake	6,000
Saccharomyces carevisiae	6,000
Saccharomyces ellipsoideus	6,000
Saccharomyces spores	8,000

Kill rates established by an independent third party testing facility

	Model Name	VH01 - 2009	VH03 - 2008	VH07 - 2010
		Large Wand	Small Wand	Bed Vacuum
Output	Watts	6	3	6
Intensity	$\mu\text{W} / \text{cm}^2$	2500	1200	6000
Total Output	$\mu\text{W} / \text{Ttl. area}$	180000	12225	528000
	Total emitting area	72.00	10.19	88.00

$\mu\text{W} / \text{cm}^2$		Minutes for 90% Kill Rate			
Typheid	2,150	1 Square cm	0.01	0.03	0.01
	72 (18cm x 4cm)	Remote Control	0.01	0.21	N/A
	144 (18cm x 4c x2)	Telephone	0.03	0.42	N/A
	480 (40cm x 32cm)	Toilet Seat	0.10	1.41	N/A
	2394 (63cm x 38cm)	Queen Pillow	0.48	N/A	0.16
	9677 (127cm x 76cm)	Baby Crib Mattress	1.93	N/A	0.66
	18909 (191cm x 99cm)	Single Mattress	3.76	N/A	1.28
	26167 (191cm x 137cm)	Double Mattress	5.21	N/A	1.78
	30856 (203cm x 152cm)	Queen Mattress	6.14	N/A	2.09
	39179 (203cm x 193cm)	King Mattress	7.80	N/A	2.66
$\mu\text{W} / \text{cm}^2$					
Influenza	3,400	1 Square cm	0.02	0.05	0.01
	72 (18cm x 4cm)	Remote Control	0.02	0.33	N/A
	144 (18cm x 4c x2)	Telephone	0.05	0.67	N/A
	480 (40cm x 32cm)	Toilet Seat	0.15	2.22	N/A
	2394 (63cm x 38cm)	Queen Pillow	0.75	N/A	0.26
	9677 (127cm x 76cm)	Baby Crib Mattress	3.05	N/A	1.04
	18909 (191cm x 99cm)	Single Mattress	5.95	N/A	2.03
	26167 (191cm x 137cm)	Double Mattress	8.24	N/A	2.81
	30856 (203cm x 152cm)	Queen Mattress	9.71	N/A	3.31
	39179 (203cm x 193cm)	King Mattress	12.33	N/A	4.20
$\mu\text{W} / \text{cm}^2$					
Hepatitis	5,800	1 Square cm	0.04	0.05	0.01
	72 (18cm x 4cm)	Remote Control	0.04	0.57	N/A
	144 (18cm x 4c x2)	Telephone	0.08	1.14	N/A
	480 (40cm x 32cm)	Toilet Seat	0.26	3.80	N/A
	2394 (63cm x 38cm)	Queen Pillow	1.29	N/A	0.44
	9677 (127cm x 76cm)	Baby Crib Mattress	5.20	N/A	1.77
	18909 (191cm x 99cm)	Single Mattress	10.15	N/A	3.46
	26167 (191cm x 137cm)	Double Mattress	14.05	N/A	4.79
	30856 (203cm x 152cm)	Queen Mattress	16.57	N/A	5.65
	39179 (203cm x 193cm)	King Mattress	21.04	N/A	7.17
$\mu\text{W} / \text{cm}^2$					
Anthrax	4,520	1 Square cm	0.03	0.06	0.01
	72 (18cm x 4cm)	Remote Control	0.03	0.44	N/A
	144 (18cm x 4c x2)	Telephone	0.06	0.89	N/A
	480 (40cm x 32cm)	Toilet Seat	0.20	2.96	N/A
	2394 (63cm x 38cm)	Queen Pillow	1.00	N/A	0.34
	9677 (127cm x 76cm)	Baby Crib Mattress	4.05	N/A	1.38
	18909 (191cm x 99cm)	Single Mattress	7.91	N/A	2.70
	26167 (191cm x 137cm)	Double Mattress	10.95	N/A	3.73
	30856 (203cm x 152cm)	Queen Mattress	12.91	N/A	4.40
	39179 (203cm x 193cm)	King Mattress	16.40	N/A	5.59
$\mu\text{W} / \text{cm}^2$					
Mold A - <i>Oospora lactis</i>	5,000	1 Square cm	0.03	0.07	0.01
	72 (18cm x 4cm)	Remote Control	0.03	0.49	N/A
	144 (18cm x 4c x2)	Telephone	0.07	0.98	N/A
	480 (40cm x 32cm)	Toilet Seat	0.22	3.27	N/A
	2394 (63cm x 38cm)	Queen Pillow	1.11	N/A	0.38
	9677 (127cm x 76cm)	Baby Crib Mattress	4.48	N/A	1.53
	18909 (191cm x 99cm)	Single Mattress	8.75	N/A	2.98
	26167 (191cm x 137cm)	Double Mattress	12.11	N/A	4.13
	30856 (203cm x 152cm)	Queen Mattress	14.29	N/A	4.87
	39179 (203cm x 193cm)	King Mattress	18.14	N/A	6.18
$\mu\text{W} / \text{cm}^2$					
Dust Mite Eggs*	17,500	1 Square cm	0.12	0.24	0.05
	2394 (63cm x 38cm)	Queen Pillow	3.88	57.12	1.32
	9677 (127cm x 76cm)	Baby Crib Mattress	15.68	230.88	5.35
	18909 (191cm x 99cm)	Single Mattress	30.64	451.13	10.45
	26167 (191cm x 137cm)	Double Mattress	42.40	624.30	14.45
	30856 (203cm x 152cm)	Queen Mattress	50.00	736.17	17.04
	39179 (203cm x 193cm)	King Mattress	63.48	934.74	21.64

* Dust Mite Eggs 90% kill rate approximated from 80% and 100% kill rate measurements



MFG Solutions, Inc.

UV-C OUTPUT TEST REPORT

391 Bridgepoint Way, South St. Paul, MN 55075 : t:651-203-2100 : f:615-203-2110

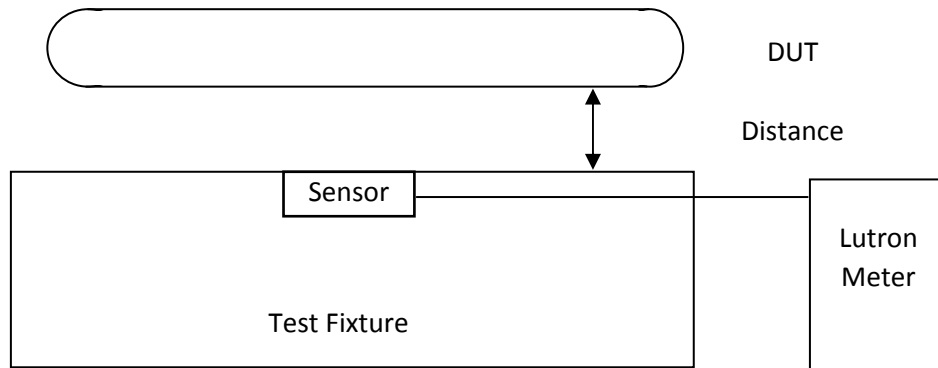
Report Number: 704140-001
Prepared By: Eric McKee
Model Number: VH01WW4
Test Description: UV-C Output Measurement

Date: November 16, 2009

Notes: This test measured the total light output of the DUT at 253.7nm wavelength.

Test Equipment: Lutron UVC-254

Measurement Setup:



Distance from Bulb to Measurement Sensor

22mm

UV Irradiance Measurements

Sample	Output	Units
1	2.74	mW/cm ²
2	2.60	mW/cm ²
3	3.08	mW/cm ²
4	3.31	mW/cm ²
5	3.23	mW/cm ²
Avg:	2.99	mW/cm ²



ORB OPTRONIX INC. LABORATORY TEST REPORT

kland, WA 98033 _ Tel: 425.605.8500 _ Fax: 801.912.2645 _ Web site: www.orboptronix.com

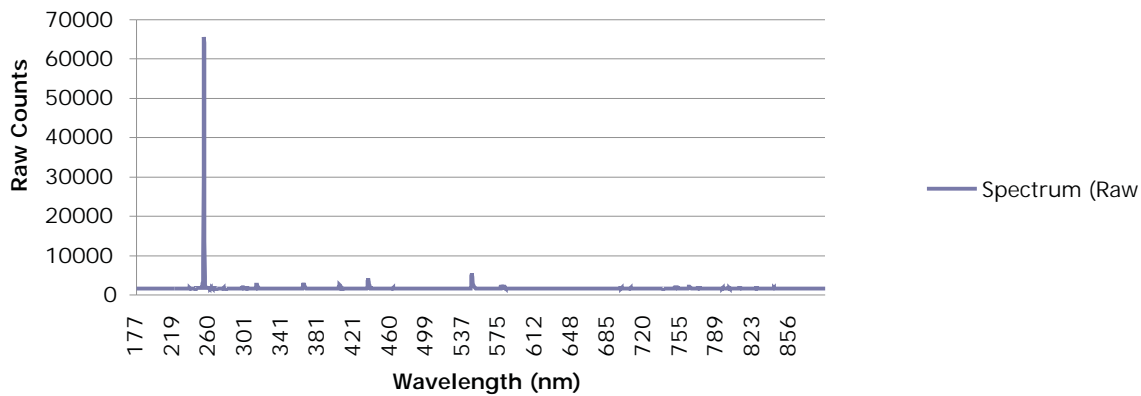
02

Date: June 3 2008

Prepared For: Verilux, Inc
Sample: Multiple
Test Description: UV Irradiance/Spectral Measurement

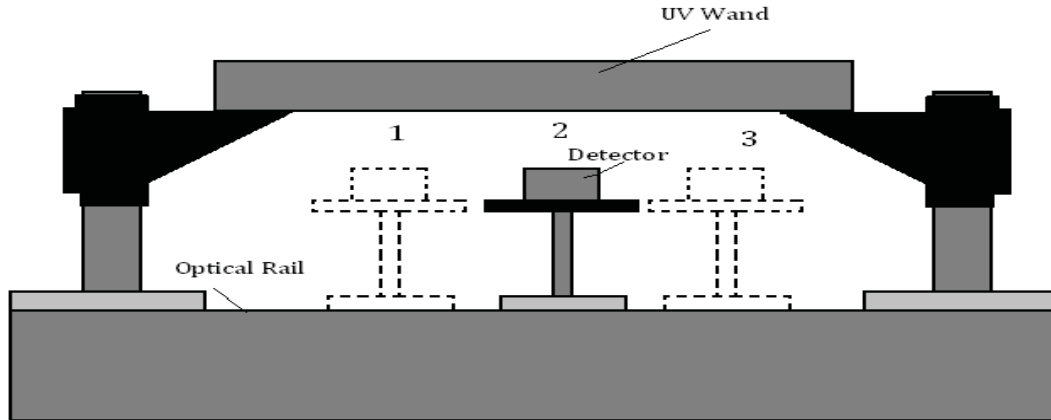
Notes: This test measures the Ultraviolet irradiance of an assortment of UV cleansing products. Irradiance measurements were taken using a Jelight JX1 Radiometer. UV and Visual spectrums were measured using an Ocean Optics USB4000.

Spectrum (Raw Counts)

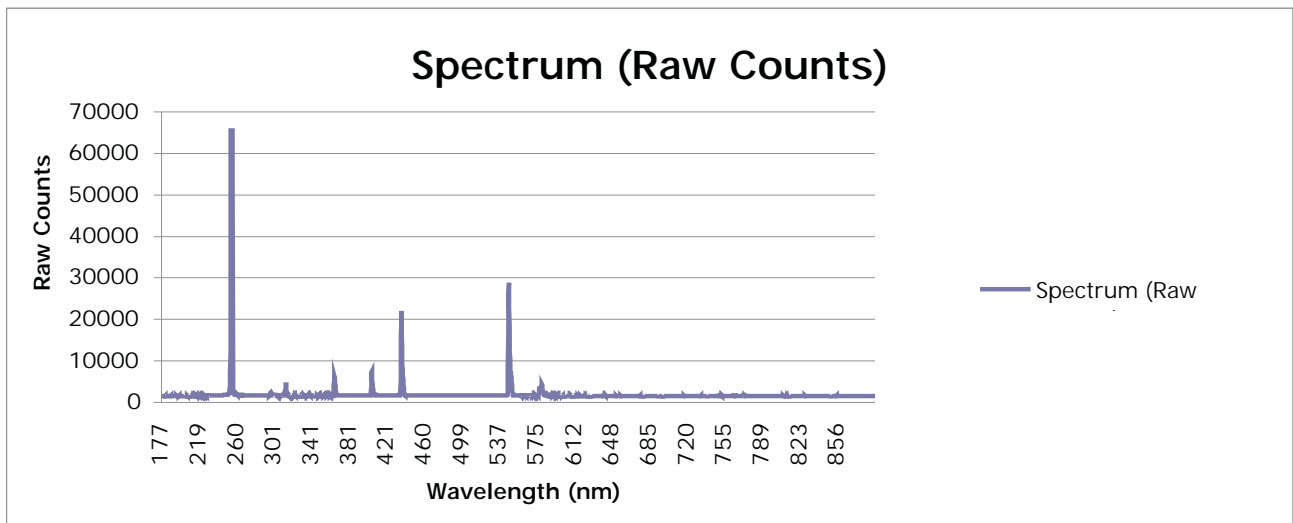


VH03

Testing Configuration



UV Irradiance Measurements			
Distance	Position 1	Position 2	Position 3
1 cm	0.637 mW/cm ²	1.201 mW/cm ²	0.852 mW/cm ²
5 cm	0.177 mW/cm ²	0.265 mW/cm ²	0.207mW/cm ²





MFG Solutions, Inc.

UV-C OUTPUT TEST REPORT

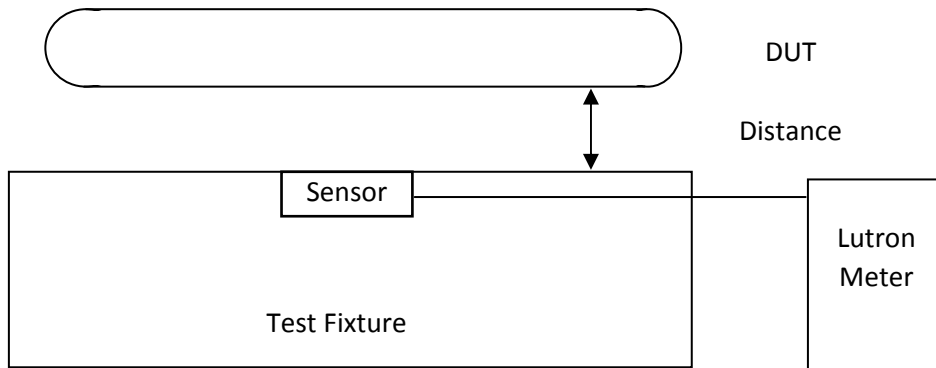
391 Bridgepoint Way, South St. Paul, MN 55075 : t:651-203-2100 : f:615-203-2110

Report Number: 704140-002 **Date:** November 24, 2009
Prepared By: Eric McKee
Model Number: VH07
Test Description: UV-C Output Measurement

Notes: This test measured the total light output of the DUT at 253.7nm wavelength.

Test Equipment: Lutron UVC-254

Measurement Setup:



Distance from Bulb to Measurement Sensor

9 mm

UV Irradiance Measurements

Sample	Output	Units
1	8.32	mW/cm ²