

Efficiency table for the open UVC function SPECTRA Reflect 55W with REFLECTOR									
The table shows the time required to kill different types of bacteria and viruses from different distances									
	Type	Distance in meters						Time	REFERENCE
		1	2	3	4	5	6		
Bacteria									
Aeromonas hydrophila ATCC7966	Bacteria	19,84	64,94	142,86	238,10	384,62	555,56	N e e d t i m e i n s e c o n d s N e e d e d	Wilson et al. 1992
Aeromonas salmonicida	Bacteria	23,41	76,62	168,57	280,95	453,85	655,56		Liltved and Landfald 1996
Bacillus anthracis – Anthrax	Bacteria	71,75	234,81	516,57	860,95	1 390,77	2 008,89		UV-Light.co.UK
Bacillus magaterium sp. (veg.)	Bacteria	20,63	67,53	148,57	247,62	400,00	577,78		UV-Light.co.UK
Bacillus paratyphus	Bacteria	50,79	166,23	365,71	609,52	984,62	1 422,22		UV-Light.co.UK
Bacillus subtilis	Bacteria	92,06	301,30	662,86	1 104,76	1 784,62	2 577,78		UV-Light.co.UK
Campylobacter jejuni	Bacteria	15,87	51,95	114,29	190,48	307,69	444,44		Measurement by Grizzly
Campylobacter jejuni ATCC 43429	Bacteria	18,25	59,74	131,43	219,05	353,85	511,11		Wilson et al. 1992
Citrobacter diversus	Bacteria	45,63	149,35	328,57	547,62	884,62	1 277,78		Giese and Darby 2000
Citrobacter freundii	Bacteria	51,59	168,83	371,43	619,05	1 000,00	1 444,44		Giese and Darby 2000
Clostridium tetani	Bacteria	87,30	285,71	628,57	1 047,62	1 692,31	2 444,44		Light Sources Inc. 2014
Corynebacterium diphtheriae	Bacteria	53,49	175,06	385,14	641,90	1 036,92	1 497,78		UV-Light.co.UK
Ebertelia typhosa	Bacteria	33,97	111,17	244,57	407,62	658,46	951,11		UV-Light.co.UK
Escherichia coli	Bacteria	15,87	51,95	114,29	190,48	307,69	444,44		Measurement by Grizzly
Escherichia coli O157:H7	Bacteria	15,87	51,95	114,29	190,48	307,69	444,44		Yaun et al. 2003
Escherichia coli O157:H7 CCUG 29193	Bacteria	27,78	90,91	200,00	333,33	538,46	777,78		Sommer et al. 2000
Halobacterium elongate ATCC33173	Bacteria	3,97	12,99	28,57	47,62	76,92	111,11		Martin et al. 2000
Halobacterium salinarum ATCC43214	Bacteria	79,37	259,74	571,43	952,38	1 538,46	2 222,22		Martin et al. 2000
Klebsiella pneumoniae	Bacteria	79,37	259,74	571,43	952,38	1 538,46	2 222,22		Giese and Darby 2000
Klebsiella terrigena ATCC33257	Bacteria	43,65	142,86	314,29	523,81	846,15	1 222,22		Wilson et al. 1992
Legionella pneumophila	Bacteria	27,78	90,91	200,00	333,33	538,46	777,78		Measurement by Grizzly
Legionella pneumophila ATCC33152	Bacteria	30,56	100,00	220,00	366,67	592,31	855,56		Oguma et al.2004
Leptospiracanicola – infectious Jaundice	Bacteria	50,00	163,64	360,00	600,00	969,23	1 400,00		UV-Light.co.UK
Micrococcus candidus	Bacteria	96,03	314,29	691,43	1 152,38	1 861,54	2 688,89		UV-Light.co.UK
Micrococcus sphaeroides	Bacteria	15,87	51,95	114,29	190,48	307,69	444,44		UV-Light.co.UK
MRSA	Bacteria	50,79	166,23	365,71	609,52	984,62	1 422,22		UV-Light.co.UK
Mycobacterium tuberculosis	Bacteria	98,41	322,08	708,57	1 180,95	1 907,69	2 755,56		UV-Light.co.UK
Neisseria catarrhalis	Bacteria	69,84	228,57	502,86	838,10	1 353,85	1 955,56		UV-Light.co.UK
Phytomonas tumefaciens	Bacteria	69,84	228,57	502,86	838,10	1 353,85	1 955,56		UV-Light.co.UK
Proteus vulgaris	Bacteria	47,62	155,84	342,86	571,43	923,08	1 333,33		UV-Light.co.UK
Pseudomonas aeruginosa	Bacteria	87,30	285,71	628,57	1 047,62	1 692,31	2 444,44		UV-Light.co.UK
Pseudomonas fluorescens	Bacteria	55,56	181,82	400,00	666,67	1 076,92	1 555,56		UV-Light.co.UK
Pseudomonas stutzeri	Bacteria	912,70	2 987,01	6 571,43	10 952,38	17 692,31	25 555,56		Joux et al. 1999
Salmonella typhi	Bacteria	25,40	83,12	182,86	304,76	492,31	711,11		Measurement by Grizzly
Salmonella paratyphi – Enteric fever	Bacteria	50,79	166,23	365,71	609,52	984,62	1 422,22		UV-Light.co.UK
Salmonella anatum	Bacteria	59,52	194,81	428,57	714,29	1 153,85	1 666,67		Measurement by Grizzly
Salmonella anatum (from human feces)	Bacteria	59,52	194,81	428,57	714,29	1 153,85	1 666,67	Tosa and Hirata 1998	
Salmonella derby (from human feces)	Bacteria	29,76	97,40	214,29	357,14	576,92	833,33	Tosa and Hirata 1998	
Salmonella enteritidis	Bacteria	35,71	116,88	257,14	428,57	692,31	1 000,00	Measurement by Grizzly	
Salmonella enteritidis	Bacteria	63,49	207,79	457,14	761,90	1 230,77	1 777,78	UV-Light.co.UK	
Salmonella infantis (from human feces)	Bacteria	23,81	77,92	171,43	285,71	461,54	666,67	Tosa and Hirata 1998	
Salmonella typhimurium	Bacteria	19,84	64,94	142,86	238,10	384,62	555,56	Measurement by Grizzly	
Salmonella typhimurium	Bacteria	126,98	415,58	914,29	1 523,81	2 461,54	3 555,56	UV-Light.co.UK	
Salmonella typhosa – Typhoid fever	Bacteria	34,13	111,69	245,71	409,52	661,54	955,56	UV-Light.co.UK	
Sarcina lutea	Bacteria	312,70	1 023,38	2 251,43	3 752,38	6 061,54	8 755,56	UV-Light.co.UK	
Serratia marcescens	Bacteria	38,41	125,71	276,57	460,95	744,62	1 075,56	UV-Light.co.UK	
Shigella dysenteriae	Bacteria	7,94	25,97	57,14	95,24	153,85	222,22	Measurement by Grizzly	
Shigella dysenteriae – Dysentery	Bacteria	34,92	114,29	251,43	419,05	676,92	977,78	UV-Light.co.UK	
Shigella flexneri – Dysentery	Bacteria	26,98	88,31	194,29	323,81	523,08	755,56	UV-Light.co.UK	
Shigella paradysenteriae	Bacteria	26,67	87,27	192,00	320,00	516,92	746,67	UV-Light.co.UK	
Shigella sonnei	Bacteria	25,79	84,42	185,71	309,52	500,00	722,22	Measurement by Grizzly	
Shigella sonnei ATCC9290	Bacteria	32,54	106,49	234,29	390,48	630,77	911,11	Chang et al. 1985	
Spirillum rubrum	Bacteria	69,84	228,57	502,86	838,10	1 353,85	1 955,56	UV-Light.co.UK	

Staphylococcus albus	Bacteria	29,21	95,58	210,29	350,48	566,15	817,78	i m e i n s e c o n d s N e e d e d t i m e i n s e c o n d s N	UV-Light.co.UK
Staphylococcus aureus	Bacteria	25,79	84,42	185,71	309,52	500,00	722,22		Measurement by Grizzly
Staphylococcus aureus	Bacteria	41,27	135,06	297,14	495,24	800,00	1 155,56		UV-Light.co.UK
Staphylococcus faecalis	Bacteria	39,68	129,87	285,71	476,19	769,23	1 111,11		Measurement by Grizzly
Staphylococcus hemolyticus	Bacteria	34,29	112,21	246,86	411,43	664,62	960,00		UV-Light.co.UK
Staphylococcus lactis	Bacteria	97,62	319,48	702,86	1 171,43	1 892,31	2 733,33		UV-Light.co.UK
Streptococcus faecalis ATCC29212	Bacteria	44,44	145,45	320,00	533,33	861,54	1 244,44		Chang et al. 1985
Streptococcus viridans	Bacteria	31,75	103,90	228,57	380,95	615,38	888,89		UV-Light.co.UK
Vibrio anguillarum	Bacteria	7,94	25,97	57,14	95,24	153,85	222,22		Liltved and Landfald 1996
Vibrio comma – Cholera	Bacteria	53,57	175,32	385,71	642,86	1 038,46	1 500,00		UV-Light.co.UK
Vibrio cholerae	Bacteria	8,73	28,57	62,86	104,76	169,23	244,44		Measurement by Grizzly
Vibrio natriegens	Bacteria	515,87	1 688,31	3 714,29	6 190,48	10 000,00	14 444,44		Joux et al. 1999
Yersinia enterocolitica ATCC27729	Bacteria	18,25	59,74	131,43	219,05	353,85	511,11		Wilson et al. 1992
Yersinia enterocolitica	Bacteria	14,68	48,05	105,71	176,19	284,62	411,11		Measurement by Grizzly
Yersinia ruckeri	Bacteria	19,84	64,94	142,86	238,10	384,62	555,56		Liltved and Landfald 1996
Aspergillus flavus	Molds	952,38	3 116,88	6 857,14	11 428,57	18 461,54	26 666,67		UV-Light.co.UK
Aspergillus glaucus	Molds	698,41	2 285,71	5 028,57	8 380,95	13 538,46	19 555,56		UV-Light.co.UK
Aspergillus niger	Molds	2 095,24	6 857,14	15 085,71	25 142,86	40 615,38	58 666,67		UV-Light.co.UK
Mucor racemosus A	Molds	269,84	883,12	1 942,86	3 238,10	5 230,77	7 555,56		UV-Light.co.UK
Mucor racemosus B	Molds	269,84	883,12	1 942,86	3 238,10	5 230,77	7 555,56		UV-Light.co.UK
Oospora lactis	Molds	79,37	259,74	571,43	952,38	1 538,46	2 222,22		UV-Light.co.UK
Penicillium digitatum	Molds	698,41	2 285,71	5 028,57	8 380,95	13 538,46	19 555,56		UV-Light.co.UK
Penicillium expansum	Molds	206,35	675,32	1 485,71	2 476,19	4 000,00	5 777,78		UV-Light.co.UK
Penicillium roqueforti	Molds	206,35	675,32	1 485,71	2 476,19	4 000,00	5 777,78		UV-Light.co.UK
Rhizopus nigricans	Molds	1 761,90	5 766,23	12 685,71	21 142,86	34 153,85	49 333,33		UV-Light.co.UK
B-40	Phage	91,27	298,70	657,14	1 095,24	1 769,23	2 555,56		Measurement by Grizzly
MS-2	Phage	206,35	675,32	1 485,71	2 476,19	4 000,00	5 777,78		Measurement by Grizzly
PRD-1	Phage	95,24	311,69	685,71	1 142,86	1 846,15	2 666,67		Measurement by Grizzly
X174	Phage	47,62	155,84	342,86	571,43	923,08	1 333,33	Measurement by Grizzly	
Cryptosporidium hominis	Protozoan	23,02	75,32	165,71	276,19	446,15	644,44	Johnson et al. 2005	
Cryptosporidium parvum	Protozoan	19,84	64,94	142,86	238,10	384,62	555,56	Measurement by Grizzly	
Cryptosporidium parvum	Protozoan	37,70	123,38	271,43	452,38	730,77	1 055,56	Craik et al. 2001	
Cryptosporidium parvum, oocysts, tissue cultur	Protozoan	12,70	41,56	91,43	152,38	246,15	355,56	Shin et al. 2000	
Encephalitozoon cuniculi,microsporidia	Protozoan	51,59	168,83	371,43	619,05	1 000,00	1 444,44	Marshall et al. 2003	
Encephalitozoon hellem,microsporidia	Protozoan	71,43	233,77	514,29	857,14	1 384,62	2 000,00	Marshall et al. 2003	
Encephalitozoon intestinalis,microsporidia	Protozoan	23,81	77,92	171,43	285,71	461,54	666,67	Huffman et al. 2002	
Giardia lamblia	Protozoan	79,37	259,74	571,43	952,38	1 538,46	2 222,22	Campbell et al. 2002	
Giardia lamblia	Protozoan	23,81	77,92	171,43	285,71	461,54	666,67	Measurement by Grizzly	
Giardia muris	Protozoan	238,10	779,22	1 714,29	2 857,14	4 615,38	6 666,67	Belosevic et al. 2001	
Chlorella Vulgaris	Protozoan	206,35	675,32	1 485,71	2 476,19	4 000,00	5 777,78	UV-Light.co.UK	
Nematode Eggs	Protozoan	714,29	2 337,66	5 142,86	8 571,43	13 846,15	20 000,00	UV-Light.co.UK	
Paramecium	Protozoan	174,60	571,43	1 257,14	2 095,24	3 384,62	4 888,89	UV-Light.co.UK	
Bacillus subtilis spores	Spores	242,06	792,21	1 742,86	2 904,76	4 692,31	6 777,78	Measurement by Grizzly	
Bacillus anthracis spores – Anthrax spores	Spores	386,03	1 263,38	2 779,43	4 632,38	7 483,08	10 808,89	UV-Light.co.UK	
Bacillus magaterium sp. spores	Spores	43,33	141,82	312,00	520,00	840,00	1 213,33	UV-Light.co.UK	
Bacillus subtilis ATCC6633(spores)	Spores	309,52	1 012,99	2 228,57	3 714,29	6 000,00	8 666,67	Chang et al. 1985	
Clostridioides difficile (C. diff) spores	Spores	95,24	311,69	685,71	1 142,86	1 846,15	2 666,67	UV-Light.co.UK	
Adenovirus Type 40	Virus	357,14	1 168,83	2 571,43	4 285,71	6 923,08	10 000,00	Measurement by Grizzly	
Adenovirus Type 41	Virus	317,46	1 038,96	2 285,71	3 809,52	6 153,85	8 888,89	Measurement by Grizzly	
Coxsackievirus B5	Virus	83,33	272,73	600,00	1 000,00	1 615,38	2 333,33	Measurement by Grizzly	
Hepatitis A	Virus	59,52	194,81	428,57	714,29	1 153,85	1 666,67	Measurement by Grizzly	
Hepatitis A, HM175	Virus	87,30	285,71	628,57	1 047,62	1 692,31	2 444,44	Measurement by Grizzly	
Influeza	Virus	26,98	88,31	194,29	323,81	523,08	755,56	Measurement by Grizzly	
Poliovirus Type 1	Virus	91,27	298,70	657,14	1 095,24	1 769,23	2 555,56	Measurement by Grizzly	
Rotavirus SA11	Virus	91,27	298,70	657,14	1 095,24	1 769,23	2 555,56	Measurement by Grizzly	

Adenovirus type 15 / A549 cell line (ATCC CCL	Virus/Host	654,76	2 142,86	4 714,29	7 857,14	12 692,31	18 333,33
Adenovirus type 2 / PLC / PRF / 5	Virus/Host	634,92	2 077,92	4 571,43	7 619,05	12 307,69	17 777,78
Bacteriophage – E. Coli / -----	Virus/Host	412,70	1 350,65	2 971,43	4 952,38	8 000,00	11 555,56
Calicivirus canine / MDCK cell line	Virus/Host	119,05	389,61	857,14	1 428,57	2 307,69	3 333,33
Calicivirus feline / CRFK cell line	Virus/Host	119,05	389,61	857,14	1 428,57	2 307,69	3 333,33
Coxsackievirus B3 / BGM cell line	Virus/Host	128,97	422,08	928,57	1 547,62	2 500,00	3 611,11
Coxsackievirus B5 / BGM cell line	Virus/Host	142,86	467,53	1 028,57	1 714,29	2 769,23	4 000,00
Echovirus I / BGM cell line	Virus/Host	130,95	428,57	942,86	1 571,43	2 538,46	3 666,67
Echovirus II / BGM cell line	Virus/Host	111,11	363,64	800,00	1 333,33	2 153,85	3 111,11
Hepatitis A HM175 / FRhk-4 cell	Virus/Host	117,46	384,42	845,71	1 409,52	2 276,92	3 288,89
Infectious Hepatitis / -----	Virus/Host	920,63	3 012,99	6 628,57	11 047,62	17 846,15	25 777,78
Influenza / -----	Virus/Host	539,68	1 766,23	3 885,71	6 476,19	10 461,54	15 111,11
MS2 (Phage) / E. coli	Virus/Host	396,83	1 298,70	2 857,14	4 761,90	7 692,31	11 111,11
Norovirus / -----	Virus/Host	103,17	337,66	742,86	1 238,10	2 000,00	2 888,89
Parvovirus / -----	Virus/Host	18,25	59,74	131,43	219,05	353,85	511,11
PHI X 174 (Phage) / E. coli WG 5	Virus/Host	39,68	129,87	285,71	476,19	769,23	1 111,11
Poliovirus – Poliomyelitis / -----	Virus/Host	500,00	1 636,36	3 600,00	6 000,00	9 692,31	14 000,00
Poliovirus 1 / CaCo2 cell-line (ATCC HTB37)	Virus/Host	146,83	480,52	1 057,14	1 761,90	2 846,15	4 111,11
PRD-1 (Phage) / S. typhimurium	Virus/Host	119,44	390,91	860,00	1 433,33	2 315,38	3 344,44
Reovirus Type 1 Lang strain / N/A	Virus/Host	142,86	467,53	1 028,57	1 714,29	2 769,23	4 000,00
Reovirus-3 / Mouse L-60	Virus/Host	88,89	290,91	640,00	1 066,67	1 723,08	2 488,89
Rotavirus / MA104 cells	Virus/Host	793,65	2 597,40	5 714,29	9 523,81	15 384,62	22 222,22
Rotavirus SA-11 / MA-104 cell	Virus/Host	142,86	467,53	1 028,57	1 714,29	2 769,23	4 000,00
SARS-CoV-2 / N/A 99%	Virus/Host	15,87	51,95	114,29	190,48	307,69	444,44
SARS-CoV-2 / N/A 99,9999%	Virus/Host	87,30	285,71	628,57	1 047,62	1 692,31	2 444,44
Staphylococcus aureus phage A / Staphylococ	Virus/Host	142,86	467,53	1 028,57	1 714,29	2 769,23	4 000,00
Tobacco mosaic / N/A	Virus/Host	1 746,03	5 714,29	12 571,43	20 952,38	33 846,15	48 888,89
Brewers yeast	Yeasts	52,38	171,43	377,14	628,57	1 015,38	1 466,67
Candida auris	Yeasts	761,90	2 493,51	5 485,71	9 142,86	14 769,23	21 333,33
Common yeast cake	Yeasts	95,24	311,69	685,71	1 142,86	1 846,15	2 666,67
Saccharomyces carevisiae	Yeasts	95,24	311,69	685,71	1 142,86	1 846,15	2 666,67
Saccharomyces ellipsoideus	Yeasts	95,24	311,69	685,71	1 142,86	1 846,15	2 666,67
Saccharomyces spores	Yeasts	126,98	415,58	914,29	1 523,81	2 461,54	3 555,56

5 minutes
10 minutes
15 minutes
20 minutes
25 minutes
25+ minutes

e	Thompson et al. 2003
e	Gerba et al. 2002
e	UV-Light.co.UK
d	Husman et al. 2004
d	Thurston-Enriquez et al. 2003
d	Gerba et al. 2002
d	Gerba et al. 2002
d	Gerba et al. 2002
d	Gerba et al. 2002
i	Wilson et al. 1992
m	UV-Light.co.UK
e	UV-Light.co.UK
e	Thompson et al. 2003
e	Lee et al. 2008
i	Cornelis et al. 1982
n	Sommer et al. 2001
n	UV-Light.co.UK
n	Thompson et al. 2003
s	Meng and Gerba 1996
e	Harris et al. 1987
c	Rauth 1965
o	Caballero et al. 2004
n	Wilson et al. 1992
d	Measurement by Grizzly
s	Boston University. 2020
s	Sommer et al. 1989
s	Light Sources Inc. 2014
s	
s	UV-Light.co.UK
s	Martin, W. G. Lindsley, and B. J. Green. 2020
s	UV-Light.co.UK
s	UV-Light.co.UK
s	UV-Light.co.UK
s	UV-Light.co.UK