UVC Germicidal Dosage (mJ/cm2) for Microorganisms Reduction Levels

	90%	99%	99.90%	99.99%	99.999%	99.9999%	Reference
Spore							
Bacillus anthracis spores – Anthrax spores	24.32	48.64	72.96	97.28			UV-Light.co.UK
Bacillus magaterium sp. spores	2.73	5.46	8.19	10.92			UV-Light.co.UK
Bacillus subtilis ATCC6633(spores	36	48.6	61	78			Chang et al. 1985
Clostridioides difficile (C. diff) spores	6	12	18	24			UV-Light.co.UK
Bacterium							
Aeromonas salmonicida	1.5	2.7	3.1	5.9			Liltved and Landfald 1996
Aeromonas hydrophila ATCC7966	1.1	2.6	3.9	5	6.7	8.6	Wilson et al. 1992
Bacillus anthracis – Anthrax	4.52	9.04	13.56	18.08			UV-Light.co.UK
Bacillus magaterium sp. (veg.)	1.3	2.6	3.9	5.2			UV-Light.co.UK
Bacillus paratyphusus	3.2	6.4	9.6	12.8			UV-Light.co.UK
Bacillus subtilis	5.8	11.6	17.4	23.2			UV-Light.co.UK
Campylobacter jejuni ATCC 43429	1.6	3.4	4	4.6	5.9		Wilson et al. 1992
Citrobacter diversus	5	7	9	11.5	13		Giese and Darby 2000
Citrobacter freundii	5	9	13				Giese and Darby 2000
Clostridium tetani	13	22					Light Sources Inc. 2014
Corynebacterium diphtheriae	3.37	6.74	10.11	13.48			UV-Light.co.UK
Ebertelia typhosa	2.14	4.28	6.42	8.56			UV-Light.co.UK
Escherichia coli O157:H7 CCUG 29193	3.5	4.7	5.5	7			Sommer et al. 2000
Escherichia coli O157:H7	<2	<2	2.5	4	8	17	Yaun et al. 2003
Halobacterium elongate ATCC33173	0.4	0.7	1				Martin et al. 2000
Halobacterium salinarum ATCC43214	12	15	17.5	20			Martin et al. 2000
Klebsiella pneumoniae	12	15	17.5	20			Giese and Darby 2000
Klebsiella terrigena ATCC33257	4.6	6.7	8.9	11			Wilson et al. 1992
Legionella pneumophila ATCC33152	1.9	3.8	5.8	7.7	9.6		Oguma et al.2004
Leptospiracanicola – infectious Jaundice	3.15	6.3	9.45	12.6			UV-Light.co.UK
Micrococcus candidus	6.05	12.1	18.15	24.2			UV-Light.co.UK
Micrococcus sphaeroides	1	2	3	4			UV-Light.co.UK
Mycobacterium tuberculosis	6.2	12.4	18.6	24.8			UV-Light.co.UK
MRSA	3.2	6.4	9.6	12.8			UV-Light.co.UK
Neisseria catarrhalis	4.4	8.8	13.2	17.6			UV-Light.co.UK
Phytomonas tumefaciens	4.4	8.8	13.2	17.6			UV-Light.co.UK
Proteus vulgaris	3	6	9	12			UV-Light.co.UK
Pseudomonas stutzeri	100	150	195	230			Joux et al. 1999
Pseudomonas aeruginosa	5.5	11	16.5	22			UV-Light.co.UK
Pseudomonas fluorescens	3.5	7	10.5	14			UV-Light.co.UK
Salmonella anatum (from human feces)	7.5	12	15				Tosa and Hirata 1998
Salmonella derby (from human feces)	3.5	7.5					Tosa and Hirata 1998
Salmonella enteritidis	4	8	12	16			UV-Light.co.UK
Salmonella infantis (from human feces)	2	4	6				Tosa and Hirata 1998
Salmonela paratyphi – Enteric fever	3.2	6.4	9.6	12.8			UV-Light.co.UK
Salmonella typhosa – Typhoid fever	2.15	4.3	6.45	8.6			UV-Light.co.UK
Bacteria							
Salmonella typhimurium	8	16	24	32			UV-Light.co.UK
Sarcina lutea	19.7	39.4	59.1	78.8			UV-Light.co.UK
Serratia marcescens	2.42	4.84	7.26	9.68			UV-Light.co.UK
Shigella dyseteriae – Dysentery	2.2	4.4	6.6	8.8			UV-Light.co.UK
Shigella flexneri – Dysentery	1.7	3.4	5.1	6.8			UV-Light.co.UK
Shigella paradysenteriae	1.68	3.3	5.04	6.72			UV-Light.co.UK
Shigella sonnei ATCC9290	3.2	4.9	6.5	8.2			Chang et al. 1985
Spirillum rubrum	4.4	8.8	13.2	17.6			UV-Light.co.UK
Staphylococcus albus	1.84	3.68	5.52	7.36			UV-Light.co.UK
Staphylococcus aureus	2.6	5.2	7.8	10.4			UV-Light.co.UK
Staphylococcus hemolyticus	2.16	4.32	6.48	8.64			UV-Light.co.UK
Staphylococcus lactis	6.15	12.3	18.45	24.6			UV-Light.co.UK

Streptococcus faecalis ATCC29212	6.6	8.8	9.9	1.2			Chang et al. 1985
Streptococcus viridans	2	4	6	8			UV-Light.co.UK
Vibrio anguillarum	0.5	1.2	1.5	2			Liltved and Landfald 1996
Vibrio comma – Cholera	3.375	6.75	10.125	13.5			UV-Light.co.UK
Vibrio natriegens	37.5	75	100	130	150		Joux et al. 1999
Yersinia enterocolitica ATCC27729	1.7	2.8	3.7	4.6			Wilson et al. 1992
Yersinia ruckeri	1	2	3	5			Liltved and Landfald 1996
Yeasts							
Brewers yeast	3.3	6.6	9.9	13.2			UV-Light.co.UK
Common yeast cake	6	12	18	24			UV-Light.co.UK
Saccharomyces carevisiae	6	12	18	24			UV-Light.co.UK
Saccharomyces ellipsoideus	6	12	18	24			UV-Light.co.UK
Saccharomyces spores	8	16	24	32			UV-Light.co.UK
Molds							
Aspergillius flavus	60	120	180	240			UV-Light.co.UK
Aspergillius glaucus	44	88	132	176			UV-Light.co.UK
Aspergillius niger	132	264	396	528			UV-Light.co.UK
Mucor racemosus A	17	34	51	68			UV-Light.co.UK
Mucor racemosus B	17	34	51	68			UV-Light.co.UK
Oospora lactis	5	10	15	20			UV-Light.co.UK
Penicillium digitatum	44	88	132	176			UV-Light.co.UK
Penicillium expansum	13	26	39	52			UV-Light.co.UK
Penicillium roqueforti	13	26	39	52			UV-Light.co.UK
Rhisopus nigricans	111	222	333	444			UV-Light.co.UK
Protozoan							
Chlorella Vulgaris	13	26	39	52			UV-Light.co.UK
Cryptosporidium hominis	3	5.8					Johnson et al. 2005
Cryptosporidium parvum	2.4	<5	5.2	9.5			Craik et al. 2001
Cryptosporidium parvum, oocysts, tissue culture assay	1.3	2.3	3.2				Shin et al. 2000
Encephalitozoon cuniculi,microsporidia	4	9	13				Marshall et al. 2003
Encephalitozoon hellem,microsporidia	8	12	18				Marshall et al. 2003
Encephalitozoon intestinalis,microsporidia	<3	3	<6	6			Huffman et al. 2002
Giardia lamblia	<10	~10	<20				Campbell et al. 2002
Giardia muris	<10	<10	<25	~60			Belosevic et al. 2001
Nematode Eggs	45	90	135	180			UV-Light.co.UK
Paramecium	11	22	33	44			UV-Light.co.UK
Virus							
Adenovirus type 15	40	80	122	165	210		Thompson et al. 2003
Adenovirus type 2	40	78	119	160	195	235	Gerba et al. 2002
B40-8 (Phage)	11	17	23	29	35	41	Sommer et al. 2001
Bacteriophage – E. Coli	2.6	5.2	7.8	104			UV-Light.co.UK
Calicivirus canine	7	15	22	30	36		Husman et al. 2004
Calicivirus feline	5	15	22	30	39		Thurston-Enriquez et al. 2003
Coxsackievirus B3	8	16	24.5	32.5			Gerba et al. 2002
Coxsackievirus B5	9.5	18	27	36			Gerba et al. 2002
Echovirus I	8	16.5	25	33			Gerba et al. 2002
Echovirus II	7	14	20.5	28			Gerba et al. 2002
Hepatitis A HM175	5.1	13.7	22	29.6			Wilson et al. 1992
Infectious Hepatitis	5.8	11.6	17.4	232			UV-Light.co.UK
Influenza	3.4	6.8	10.2	136			UV-Light.co.UK
MS2 (Phage)		45	75	100	125	155	Thompson et al. 2003
Norovirus	10	16	22	26	30		Lee et al. 2008
Parvovirus	2.2	4.6					Cornelis et al. 1982
PHI X 174 (Phage)	3	5	7.5	10	12.5	15	Sommer et al. 2001
Poliovirus – Poliomyelitis	3.15	6.3	9.45	126			UV-Light.co.UK
Poliovirus 1	7	17	28	37			Thompson et al. 2003

PRD-1 (Phage)	9.9	17.2	23.5	30.1			Meng and Gerba 1996
Reovirus Type 1 Lang strain	16	36					Harris et al. 1987
Reovirus-3	11.2	22.4					Rauth 1965
Rotavirus	20	80	140	200			Caballero et al. 2004
Rotavirus SA-11	9.1	19	26	36	48		Wilson et al. 1992
SARS-CoV-2		5				22	Boston University. 2020
Staphylococcus aureus phage A	8	17	25	36	47		Sommer et al. 1989
Tobacco mosaic	240	440					Light Sources Inc. 2014