



**Energy dosage of
Ultraviolet
radiation in
µWs/cm² needed
for kill factor**

Seconds per mm (1.2 Tube)

Minutes per mm

| | Energy dosage of Ultraviolet radiation in µWs/cm ² needed for kill factor | | Seconds per mm (1.2 Tube) | | | | | | | | | | | | | Minutes per mm | |
|--|--|-------------|---------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|----------------|-------------|
| | 25 | 25 | 50 | 75 | 100 | 125 | 250 | 500 | 1000 | 1500 | 2000 | 2500 | 3000 | 2500 | 3000 | | |
| Bacteria | 90% | 100% | 90% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Micrococcus sphaeroides | 1,000 | 15,400 | 0 | 0 | 1 | 2 | 3 | 5 | 19 | 77 | 309 | 696 | 1,237 | 1,933 | 2,784 | 32 | 46 |
| Bacillus magaterium sp. (veg.) | 1,300 | 2,500 | 0 | 0 | 0 | 0 | 1 | 1 | 3 | 13 | 50 | 113 | 201 | 314 | 452 | 5 | 8 |
| Shigella paradysenteriae | 1,680 | 3,400 | 0 | 0 | 0 | 0 | 1 | 1 | 4 | 17 | 68 | 154 | 273 | 427 | 615 | 7 | 10 |
| Shigella flexneri - Dysentery | 1,700 | 3,400 | 0 | 0 | 0 | 0 | 1 | 1 | 4 | 17 | 68 | 154 | 273 | 427 | 615 | 7 | 10 |
| Staphylococcus albus | 1,840 | 5,720 | 0 | 0 | 0 | 1 | 1 | 2 | 7 | 29 | 115 | 258 | 460 | 718 | 1,034 | 12 | 17 |
| Streptococcus viridans | 2,000 | 3,800 | 0 | 0 | 0 | 0 | 1 | 1 | 5 | 19 | 76 | 172 | 305 | 477 | 687 | 8 | 11 |
| Ebertelia typhosa | 2,140 | 4,100 | 0 | 0 | 0 | 0 | 1 | 1 | 5 | 21 | 82 | 185 | 329 | 515 | 741 | 9 | 12 |
| Salmonella typhosa - Typhoid fever | 2,150 | 4,100 | 0 | 0 | 0 | 0 | 1 | 1 | 5 | 21 | 82 | 185 | 329 | 515 | 741 | 9 | 12 |
| Staphylococcus hemolyticus | 2,160 | 5,500 | 0 | 0 | 0 | 1 | 1 | 2 | 7 | 28 | 110 | 249 | 442 | 690 | 994 | 12 | 17 |
| Shigella dyseteriae - Dysentery | 2,200 | 4,200 | 0 | 0 | 0 | 0 | 1 | 1 | 5 | 21 | 84 | 190 | 337 | 527 | 759 | 9 | 13 |
| Serratia marcescens | 2,420 | 6,160 | 0 | 0 | 0 | 1 | 1 | 2 | 8 | 31 | 124 | 278 | 495 | 773 | 1,113 | 13 | 19 |
| Staphylococcus aerius | 2,600 | 6,600 | 0 | 0 | 0 | 1 | 1 | 2 | 8 | 33 | 133 | 298 | 530 | 828 | 1,193 | 14 | 20 |
| Bacillus magaterium sp. (spores) | 2,730 | 5,200 | 0 | 0 | 0 | 1 | 1 | 2 | 7 | 26 | 104 | 235 | 418 | 653 | 940 | 11 | 16 |
| Escherichia coli | 3,000 | 6,600 | 0 | 0 | 0 | 1 | 1 | 2 | 8 | 33 | 133 | 298 | 530 | 828 | 1,193 | 14 | 20 |
| Proteus vulgaris | 3,000 | 6,600 | 0 | 0 | 0 | 1 | 1 | 2 | 8 | 33 | 133 | 298 | 530 | 828 | 1,193 | 14 | 20 |
| Leptospira canicola - infectious Jaundice | 3,150 | 6,000 | 0 | 0 | 0 | 1 | 1 | 2 | 8 | 30 | 121 | 271 | 482 | 753 | 1,085 | 13 | 18 |
| Bacillus paratyphus | 3,200 | 6,100 | 0 | 0 | 0 | 1 | 1 | 2 | 8 | 31 | 123 | 276 | 490 | 766 | 1,103 | 13 | 18 |
| Salmonella paratyphi - Enteric fever | 3,200 | 6,100 | 0 | 0 | 0 | 1 | 1 | 2 | 8 | 31 | 123 | 276 | 490 | 766 | 1,103 | 13 | 18 |
| Corynebacterium diphtheriae | 3,370 | 6,510 | 0 | 0 | 0 | 1 | 1 | 2 | 8 | 33 | 131 | 294 | 523 | 817 | 1,177 | 14 | 20 |
| Vibrio comma - Cholera | 3,375 | 6,500 | 0 | 0 | 0 | 1 | 1 | 2 | 8 | 33 | 131 | 294 | 522 | 816 | 1,175 | 14 | 20 |
| Pseudomonas fluorescens | 3,500 | 6,600 | 0 | 0 | 0 | 1 | 1 | 2 | 8 | 33 | 133 | 298 | 530 | 828 | 1,193 | 14 | 20 |
| Salmonella enteritidis | 4,000 | 7,600 | 0 | 0 | 0 | 1 | 2 | 2 | 10 | 38 | 153 | 343 | 611 | 954 | 1,374 | 16 | 23 |
| Neisseria catarrhalis | 4,400 | 8,500 | 0 | 0 | 0 | 1 | 2 | 3 | 11 | 43 | 171 | 384 | 683 | 1,067 | 1,536 | 18 | 26 |
| Phytomonas tumefaciens | 4,400 | 8,000 | 0 | 0 | 0 | 1 | 2 | 3 | 10 | 40 | 161 | 362 | 643 | 1,004 | 1,446 | 17 | 24 |
| Spirillum rubrum | 4,400 | 6,160 | 0 | 0 | 0 | 1 | 1 | 2 | 8 | 31 | 124 | 278 | 495 | 773 | 1,113 | 13 | 19 |
| Bacillus anthracis - Anthrax | 4,520 | 8,700 | 0 | 0 | 0 | 1 | 2 | 3 | 11 | 44 | 175 | 393 | 699 | 1,092 | 1,573 | 18 | 26 |
| Pseudomonas aeruginosa | 5,500 | 10,500 | 0 | 0 | 1 | 1 | 2 | 3 | 13 | 53 | 211 | 474 | 844 | 1,318 | 1,898 | 22 | 32 |
| Bacillus subtilis | 5,800 | 11,000 | 0 | 0 | 1 | 1 | 2 | 3 | 14 | 55 | 221 | 497 | 884 | 1,381 | 1,988 | 23 | 33 |
| Micrococcus candidus | 6,050 | 12,300 | 0 | 0 | 1 | 1 | 2 | 4 | 15 | 62 | 247 | 556 | 988 | 1,544 | 2,223 | 26 | 37 |
| Staphylococcus lactis | 6,150 | 8,800 | 0 | 0 | 0 | 1 | 2 | 3 | 11 | 44 | 177 | 398 | 707 | 1,105 | 1,591 | 18 | 27 |
| Mycobacterium tuberculosis | 6,200 | 10,000 | 0 | 0 | 1 | 1 | 2 | 3 | 13 | 50 | 201 | 452 | 803 | 1,255 | 1,808 | 21 | 30 |
| Salmonella typhimurium | 8,000 | 15,200 | 0 | 0 | 1 | 2 | 3 | 5 | 19 | 76 | 305 | 687 | 1,221 | 1,908 | 2,748 | 32 | 46 |
| Bacillus subtilis spores | 11,600 | 22,000 | 0 | 0 | 1 | 2 | 4 | 7 | 28 | 110 | 442 | 994 | 1,767 | 2,762 | 3,977 | 46 | 66 |
| Clostridium tetani | 13,000 | 22,000 | 0 | 0 | 1 | 2 | 4 | 7 | 28 | 110 | 442 | 994 | 1,767 | 2,762 | 3,977 | 46 | 66 |
| Sarcina lutea | 19,700 | 26,400 | 0 | 0 | 1 | 3 | 5 | 8 | 33 | 133 | 530 | 1,193 | 2,121 | 3,314 | 4,772 | 55 | 80 |
| Bacillus anthracis spores - Anthrax spores | 24,320 | 46,200 | 0 | 1 | 2 | 5 | 9 | 14 | 58 | 232 | 928 | 2,088 | 3,712 | 5,799 | 8,351 | 97 | 139 |
| Molds | 90% | 100% | 90% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Oospora lactis | 5,000 | 11,000 | 0 | 0 | 1 | 1 | 2 | 3 | 14 | 55 | 221 | 497 | 884 | 1,381 | 1,988 | 23 | 33 |



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|---|--------------|--------------|---------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|----------------|-------------|-------------|
| | | | 25 | 25 | 50 | 75 | 100 | 125 | 250 | 500 | 1000 | 1500 | 2000 | 2500 | 3000 | 2500 | 3000 |
| Penicillium expansum | 13,000 | 22,000 | 0 | 0 | 1 | 2 | 4 | 7 | 28 | 110 | 442 | 994 | 1,767 | 2,762 | 3,977 | 46 | 66 |
| Penicillium roqueforti | 13,000 | 26,400 | 0 | 0 | 1 | 3 | 5 | 8 | 33 | 133 | 530 | 1,193 | 2,121 | 3,314 | 4,772 | 55 | 80 |
| Mucor racemosus A | 17,000 | 35,200 | 0 | 0 | 2 | 4 | 7 | 11 | 44 | 177 | 707 | 1,591 | 2,828 | 4,419 | 6,363 | 74 | 106 |
| Mucor racemosus B | 17,000 | 35,200 | 0 | 0 | 2 | 4 | 7 | 11 | 44 | 177 | 707 | 1,591 | 2,828 | 4,419 | 6,363 | 74 | 106 |
| Aspergillus glaucus | 44,000 | 88,000 | 1 | 1 | 4 | 10 | 18 | 28 | 110 | 442 | 1,767 | 3,977 | 7,070 | 11,046 | 15,907 | 184 | 265 |
| Penicillium digitatum | 44,000 | 88,000 | 1 | 1 | 4 | 10 | 18 | 28 | 110 | 442 | 1,767 | 3,977 | 7,070 | 11,046 | 15,907 | 184 | 265 |
| Aspergillus flavus | 60,000 | 99,000 | 1 | 1 | 5 | 11 | 20 | 31 | 124 | 497 | 1,988 | 4,474 | 7,953 | 12,427 | 17,895 | 207 | 298 |
| Rhizopus nigricans | 111,000 | 220,000 | 1 | 3 | 11 | 25 | 44 | 69 | 276 | 1,105 | 4,419 | 9,942 | 17,674 | 27,616 | 39,767 | 460 | 663 |
| Aspergillus niger | 132,000 | 330,000 | 2 | 4 | 17 | 37 | 66 | 104 | 414 | 1,657 | 6,628 | 14,913 | 26,511 | 41,424 | 59,651 | 690 | 994 |
| Protozoa | 90% | 100% | 90% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Paramecium | 11,000 | 20,000 | 0 | 0 | 1 | 2 | 4 | 6 | 25 | 100 | 402 | 904 | 1,607 | 2,511 | 3,615 | 42 | 60 |
| Chlorella Vulgaris | 13,000 | 22,000 | 0 | 0 | 1 | 2 | 4 | 7 | 28 | 110 | 442 | 994 | 1,767 | 2,762 | 3,977 | 46 | 66 |
| Nematode Eggs | 45,000 | 92,000 | 1 | 1 | 5 | 10 | 18 | 29 | 115 | 462 | 1,848 | 4,157 | 7,391 | 11,549 | 16,630 | 192 | 277 |
| Virus | 90% | 100% | 90% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Bacteriophage - E. Coli | 2,600 | 6,600 | 0 | 0 | 0 | 1 | 1 | 2 | 8 | 33 | 133 | 298 | 530 | 828 | 1,193 | 14 | 20 |
| Poliovirus - Poliomyelitis | 3,150 | 6,600 | 0 | 0 | 0 | 1 | 1 | 2 | 8 | 33 | 133 | 298 | 530 | 828 | 1,193 | 14 | 20 |
| Influenza (Common Cold, MERS, SARS & COVID 19) | 3,400 | 6,600 | 0 | 0 | 0 | 1 | 1 | 2 | 8 | 33 | 133 | 298 | 530 | 828 | 1,193 | 14 | 20 |
| Infectious Hepatitis | 5,800 | 8,000 | 0 | 0 | 0 | 1 | 2 | 3 | 10 | 40 | 161 | 362 | 643 | 1,004 | 1,446 | 17 | 24 |
| Tobacco mosaic | 240,000 | 440,000 | 3 | 6 | 22 | 50 | 88 | 138 | 552 | 2,209 | 8,837 | 19,884 | 35,348 | 55,232 | 79,534 | 921 | 1,326 |
| Yeast | 90% | 100% | 90% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Brewers yeast | 3,300 | 6,600 | 0 | 0 | 0 | 1 | 1 | 2 | 8 | 33 | 133 | 298 | 530 | 828 | 1,193 | 14 | 20 |
| Common yeast cake | 6,000 | 13,200 | 0 | 0 | 1 | 1 | 3 | 4 | 17 | 66 | 265 | 597 | 1,060 | 1,657 | 2,386 | 28 | 40 |
| Saccharomyces carevisiae | 6,000 | 13,200 | 0 | 0 | 1 | 1 | 3 | 4 | 17 | 66 | 265 | 597 | 1,060 | 1,657 | 2,386 | 28 | 40 |
| Saccharomyces ellipsoideus | 6,000 | 13,200 | 0 | 0 | 1 | 1 | 3 | 4 | 17 | 66 | 265 | 597 | 1,060 | 1,657 | 2,386 | 28 | 40 |
| Saccharomyces spores | 8,000 | 17,600 | 0 | 0 | 1 | 2 | 4 | 6 | 22 | 88 | 353 | 795 | 1,414 | 2,209 | 3,181 | 37 | 53 |