How & Why Ultraviolet Disinfection Works

Ultraviolet energy can be separated into UV-A, UV-B and UV-C.

Ultraviolet Germicidal Irradiation (UVGI) uses UV-C, the component of ultraviolet energy that breaks through the outer membrane of microbes like yeast, mold, bacteria, viruses, and algae. When the UV-C energy reaches the DNA of the microbe, modifications cause the microbe to lose its ability to reproduce. UVGI lamps provide a powerful and concentrated dose of UV-C energy that will sanitize the air and surfaces, destroying pathogens that come in contact with the UV rays. Musty, moldy type odors can be eradicated, along with tuberculosis, cold and flu viruses, smallpox, and other airborne diseases and influenza. The healthcare industry has been using UV germicidal energy to sanitize hospital rooms and medical equipment since the early 1900's. The Centers for Disease Control confirms the germicidal effect of UV-C lamps. FEMA recommends its use for counter-bioterrorism.

UV Dose for Inactivation

BACTERIA

Agrobacterium lumefaciens 8,500 Bacillus anthracis (anthrax veg.) 8,700
Bacillus anthracis Spores (anthrax spores) 46,200
Bacillus megatherium Sp. (veg) 2,500
Bacillus megatherium Sp. (spores) 5,200
Bacillus paratyphosus 6,100
Bacillus subtilis 11,000 Bacillus subtilis Spores 22,000
Clostridium tetani 23,100
Clostridium botulinum 11,200
Corynebacterium diphtheriae 6,500
Dysentery bacilli 4,200
Eberthella typhosa 4,100
Escherichia coli 6,600
Legionella bozemanii 3,500
Legionella dumoffi ll 5,500
Legionella gormanil 4,900
Legionella micdadei 3,100
Legionella longbeachae 2,900
Legionella pneumophila (Legionnaire's Disease) 12,300
Leptospira canicola-Infectious Jaundice 6,000
Leptospira interrogans 6,000
Micrococcus candidus 12,300
Micrococcus sphaeroides 15,400
Mycobacterium tuberculosis 10,000
Neisseria catarrhalis 8,500
Phytomonas tumefaciens 8,500
Proteus vulgaris 6,600
Pseudomonas aeruginosa (Environ.Strain) 10,500
Pseudomonas aeruginosa (Lab. Strain) 3,900
Pseudomonas fl uorescens 6,600
Streptococcus faecaila 10,000
Streptococcus hemolyticus 5,500
Streptococcus lactis 8,800
Streptococcus pyrogenes 4,200
Streptococcus salivarius 4,200
Streptococcus viridans 3,800
Vibrio comma (Cholera) 6,500
Vibrio cholerae 6,500

MOLDS

Aspergillus amstelodami 77,000
Aspergillus fl avus 99,000
Aspergillus glaucus 88,000
Aspergillus niger (breed mold) 330,000
Mucor mucedo 77,000
Mucor racemosus (A & B) 35,200
Oospora lactis 11,000
Penicillium chrysogenum 56,000
Penicillium digitatum 88,000
Penicillium expansum 22,000
Penicillium roqueforti 26,400
Rhizopus nigricans (cheese mold) 220,000

PROTOZOA

Chlorella vulgaris (algae) 22,000
Blue-green Algae 420,000
E. hystolytica 84,000
Giardia lamblia (cysts) 100,000
Nematode Eggs 40,000
Paramecium 200,000

Rhodospirillum rubrum 6,200
Salmonella enteritidis 7,600
Salmonella paratyphi (Enteric Fever) 6,100
Salmonella Species 15,200
Salmonella typhimurium 15,200 Salmonella typhi (Typhoid Fever) 7,000 Salmonella 10,500
Sarcina lutea 26,400
Serratia marcescens 6,160
Shigella dysenteriae - Dysentery 4,200
Shigella fl exneri - Dysentery 3,400
Shigella paradysenteriae 3,400
Shigella sonnei 7,000
Spirillum rubrum 6,160
Staphylococcus albus 5,720
Staphylococcus aureus 6,600
Staphylococcus epidermidis 5,800

VIRUS

Adeno Virus Type III 4,500
Bacteriophage 6,600
Coxsackie 6,300
Infectious Hepatitis 8,000
Influenza 6,600
Rotavirus 24,000
Tobacco Mosaic 440,000

YEASTS

Baker's Yeast 8,800
Brewer's Yeast 6,600 Common Yeast Cake 13,200
Saccharomyces cerevisiae 13,200
Saccharomyces ellipsoideus 13,200
Saccharomyces sp. 17,600

*Approximate - Various sources may report slightly differing inactivation dosages