



Germicidal Action

The germicidal effect of UV radiation relies upon the photo disruption effect of cell DNA of an organism, which prevents its ability to replicate.

The UV radiation emitted by a source is expressed in watts (W). Depending on the radiation distribution of that source and the distance from that source a certain amount reaches the target.

The irradiation density is expressed in watts per square metre (W/m²). For germicidal action the dose is important. The dose (E) is defined as the product of irradiation density and time (t)

Therefore the dose can be defined as Watt.seconds/cm² (or sometimes as Joules/m² where a Joule is a Watt. Second)

The Medixair is designed to contain the air to within 50mm of the source. There are 4 light sources within the chamber. The tube output at 50mm is 3750uW/cm². There is an additive function for each of the four tubes which produces a combined minimum output of 4x 3750 µW/cm². or 15, µW/cm²

The air speed through the device is 0.3m/sec over a length of 450mm, giving a transit time of 1.5 sec. This gives a dosage of

$$15,000 \mu\text{W}/\text{cm}^2 \times 1.5 \text{ sec} = 22,500 \mu\text{W. s}/\text{cm}^2$$

The following tables give the kill energies for a range of pathogens (bacteria and viruses). It can be seen that these are within the scope of medixair.

Virus	
Adenovirus 3	1,500
Bacteriophage (E. Coli virus)	3,000
Coxsackie virus A9	12,000
Coxsackie virus B1	15,500
Echovirus 1	11,000
Echovirus 2	12,000
Hepatitis A	11,000
Infectious Hepatitis virus	8,000
Influenza	3,400
Poliovirus (poliomyellitis)	6,500
Poliovirus 1	11,000
Poliovirus 2	12,000
Poliovirus 3	10,000
Reovirus 1	15,400
Rotavirus SA11	7,800

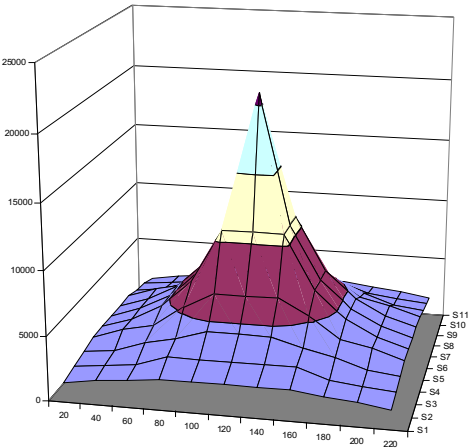
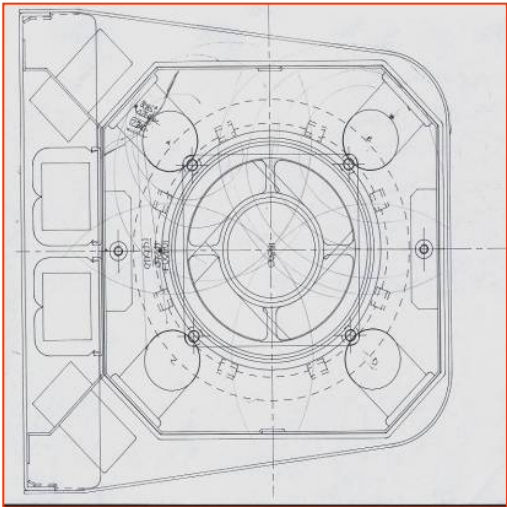
Bacteria

Agrobacterium Tumefaciens	4,200
Bacillus Anthracis	4,500
Bacillus Megaterium (Spore)	9,070
Bacillus Megaterium	3,750
Bacillus Subtilis (spore)	12,000
Bacillus Subtilis	7,100
Bacillus Paratyphosus	3,200
Bacillus Enteritidis	4,000
Corynebacterium Diptheriae	3,750
Clostridium Tetani	4,900
Clostridium Botulinium	12,000
Dysentery Bacilli	2,200
Eberthella Typhosa	2,140
E. Coli	5,400
Leptospira Spp (Infectious Jaundice)	3,000
Legionella Pneumophila	2,040
Legionella Bozemanii	1,800
Legionella Dumoffii	3,000
Legionella Gormanii	2,500
Legionella Micdadei	1,500
Legionella Longbeachae	1,500
Listeria Monocytogenes	3,400
Micrococcus candidus	6,050
Micrococcus sphaeroides	10,000

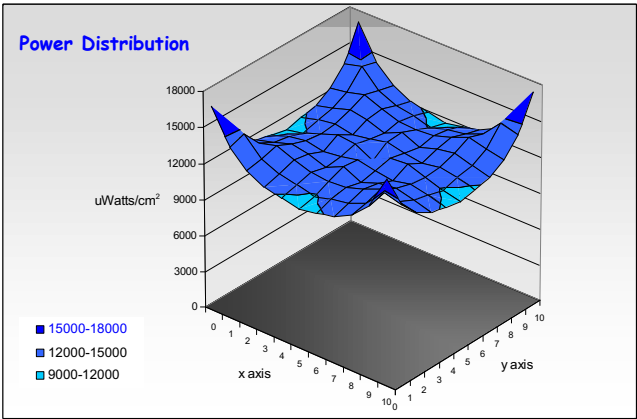
Bacteria

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	7,600
Salmonella Paratyphi	6,100
Salmonella Typhimurium	8,000
Samonella Typhosa	6,000
Sarcina Lutea	19,700
Serratia Marcesens	2,420
Shighella Dysenteriae	4,200
Shigella Paradyseuterea	1,680
Shigella Flexneri	1,700
Shigella Sonnei	2,100
Spirillum Rubsum	4,400
Staphylococcus Albus	1,840
Staphylococcus Aureus	2,600
Streptococcus Haemolyticus(A)	6,700
Streptococcus Haemolyticus(D)	9,500
Streptococcus Lactis	6,150
Streptococcus Viridans	2,000
Streptococcus Pyrogenes	2,160
Streptococcus salivarius	2,000

Cross section through medixair



UV output from a single tube



UV output from a medixair 4 tube array