

BIOVITAE[®]

GENERAL PRESENTATION

BIOVITAE®

Biovitae is a microbicidal technology able to kill germs and bacteria in air and on surfaces through its patented multiwavelength of the visible spectrum (NO UV).

The only LED Technology that can provide with the continuous sanitisation.

Continuous sanitisation acts in the presence of humans, when the infection's risk is higher.

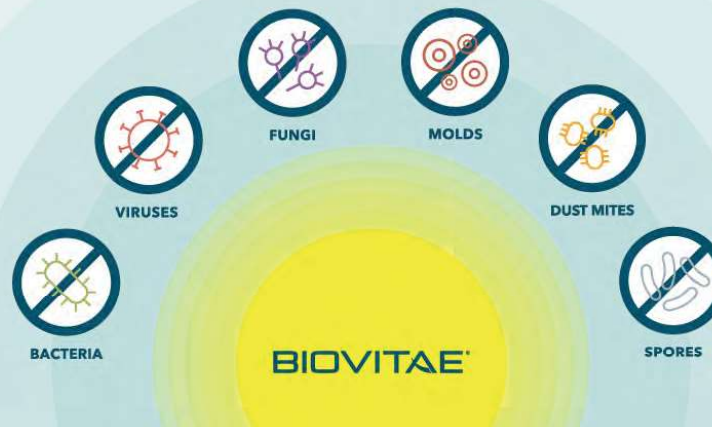
It keeps the microbial load constantly below the infective dose

Tested efficacy on many viruses and bacteria by third party in many different conditions

It sanitizes the environments with lower environmental impact than alternative solutions

Requires no structural interventions.

First technology that uses a patented multiple combination of frequencies of the visible spectrum (400-420nm, 430-460nm, 500-780nm)..



BIOVITAE®

EFFECTIVENESS TESTED ON BACTERIA AND VIRUSES

EFFECTIVE ON AIR AND SURFACES

SANITIZES CONTINUOUSLY WITHOUT STERILIZING

REDUCES THE RISKS OF INFECTIONS

SAFE FOR HUMANS AND ANIMALS

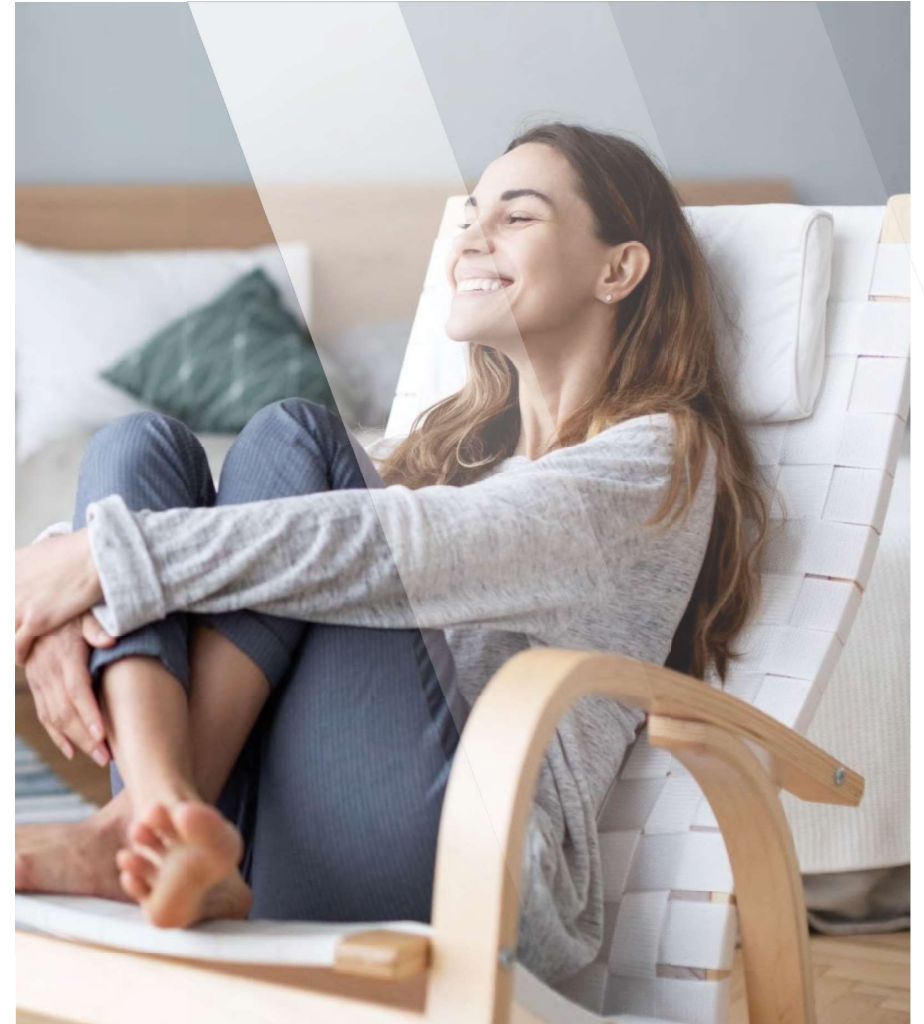
100% UV-FREE WHITE LED LIGHT

ECO-FRIENDLY



Effective on all bacteria, it kills 99.8 percent of Coronavirus within minutes.

BIOVITAE®

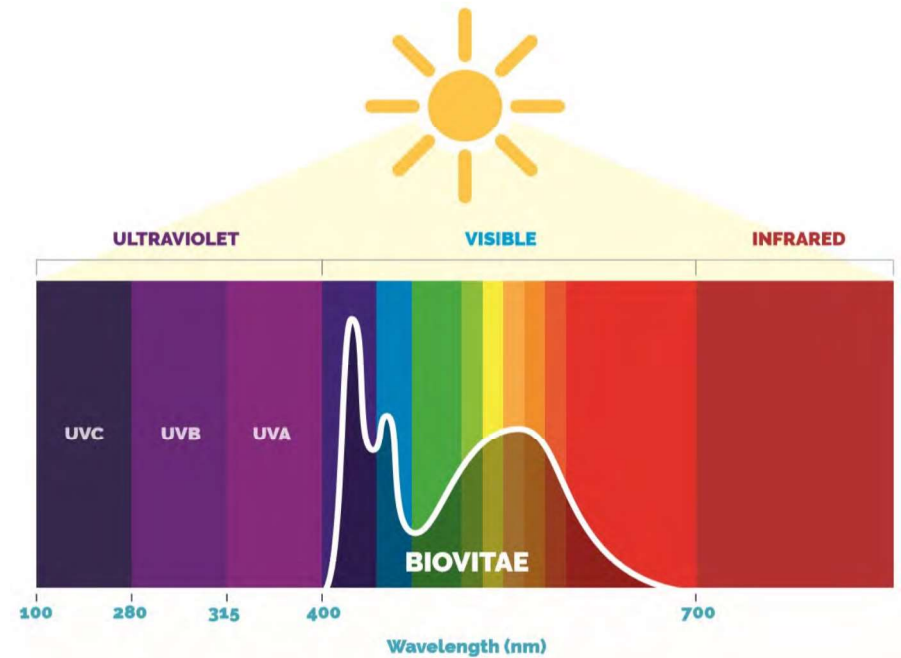


BIOVITAE INTRODUCES SAFE AND CONTINUOUS SANITISATION

Only Biovitae offers continuous sanitization of environments.

Neither ultraviolet (UV) light frequencies nor chemical disinfectants can guarantee continuous room sanitization because they cannot be used in the presence of people and are harmful to the environment and living things.

Continuous sanitization is the most effective solution to prevent and contain microbial infections



**WORKS DURING
THE PRESENCE
OF HUMANS**



**LED (UV-FREE)
NO RISK FROM
EXPOSURE**



**SANITIZES
DURING DAILY
ACTIVITIES**

"ALL IN ONE" DEVICES

SANITISATION + ILLUMINATION



BIOVITAE PRO



BIOVITAE LOBBY



BIOVITAE ORBIT



BIOVITAE DOMUS



BIOVITAE GU10



BIOVITAE TUBE

TESTS ON BACTERIA

(in vivo and in vitro)



- E. coli MG1655 (ATCC 700926)
- E. coli, ATCC25922
- S. typhi (Ty21a-ATCC 33459)
- Klebsiella spp.,
- Enterobacter spp.,
- Pseudomonas spp.,
- S. aureus,
- S. microti,
- S.agalactiae
- S. uberis,
- S. dysgalactiae
- MRSA
- Total Mesophilic Load
- Enterobacteriaceae
- S.aureus, ATCC 6538
- B. atrophaeus, ATCC 9372
- P.aeruginosa, ATCC 27853
- S. cerevisiae
- B.subtilis

TESTS ON VIRUSES

(in vitro)



- Vaccinia (Monkeypox)
- Chikungunya
- Sars-CoV2
- Yellow Fever

Rapid inactivation of SARS-CoV-2 with LED irradiation of visible spectrum wavelengths

Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

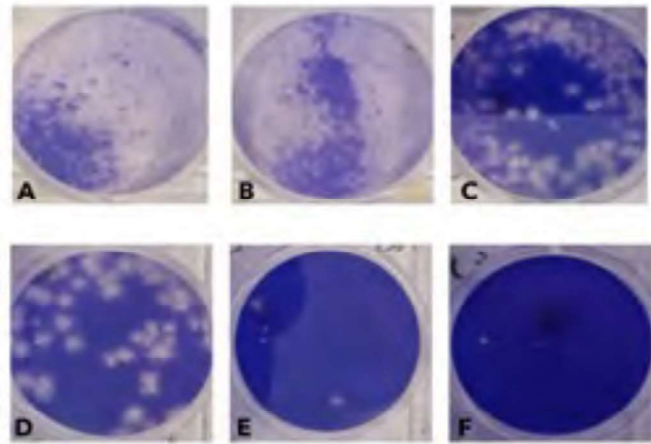
Journal of Photochemistry and Photobiology

ELSEVIER journal homepage: www.elsevier.com/locate/journal-of-photochemistry-and-photobiology

* Scientific Department, Army Medical Center, Rome, Italy
 ** 7th CBRN Defence Regiment "Crimosa", Crotone, Italy
 *** Department of Infectious Disease, National Institute of Health, Rome, Italy
 **** Department of Public Health and Infectious Diseases, Laboratory Affiliated to Prater Italia Fondazione Carlo Galvani, "Sapienza" University of Rome, Italy
 ***** Department of CBRN Protection and Security, Swedish Defence Research Agency (FOU), Umeå, Sweden
 ***** Torsten Vihai and Norbert Müller, Bundeswehr Institute of Microbiology, Munich, Germany

EFFICACY ON VIRUSES

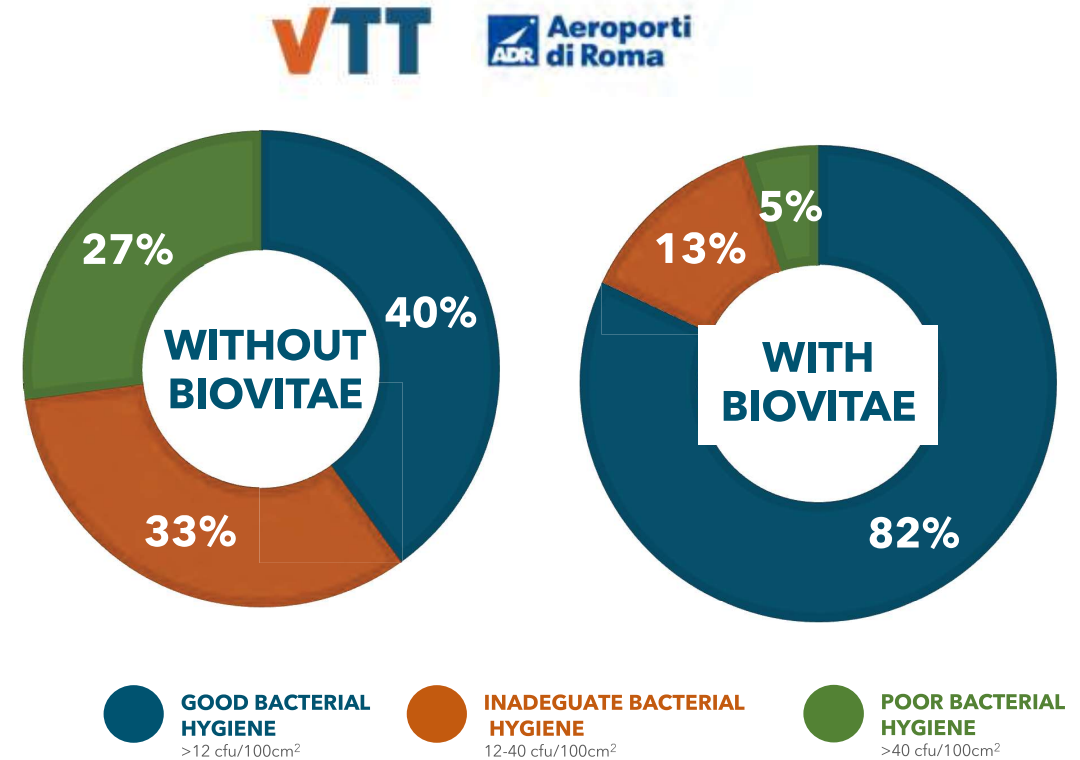
In vitro tests - Efficacy tested on the following strains



99.8% REDUCTION OF SARS-COV-2

EFFICACY ON BACTERIA

In vivo tests carried out in the Emergency Hospital of Fiumicino Airport



Biovitae's efficacy on Biofilm

Researchers have tested antimicrobial blue light in the range of 405 to 470 nanometres against a multitude of biofilm forming microbes, both with single-species and multi-species biofilms.

The three factors that make Biovitae more effective against Biofilm are:

Blue light penetrates biofilm better than chemicals and UVC.

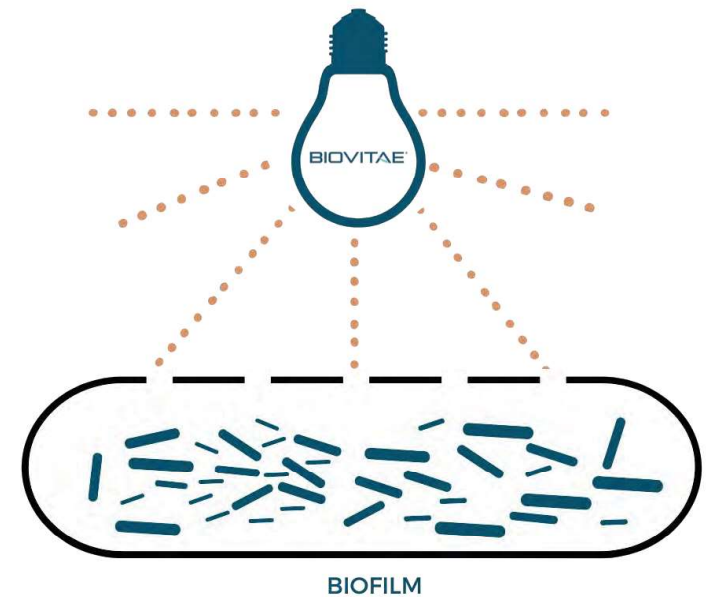
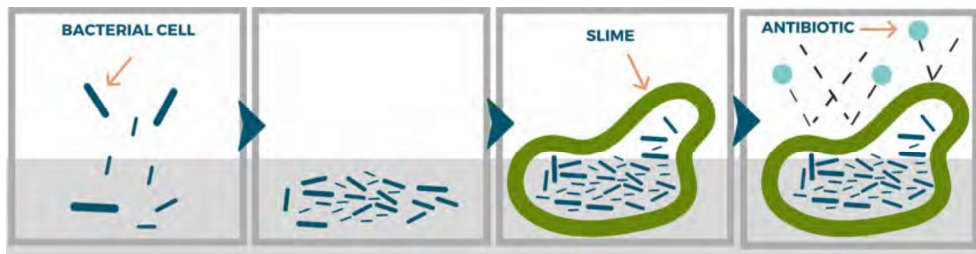
- It can reach the microbes behind the protective layer and affect them directly.

Blue light is very unlikely to promote the development of antimicrobial resistance.

The mechanism of action of Biovitae is based on generating Reactive Oxygen Species (ROS) inside the microbial cells by causing wide-ranging and unspecific damages, which make it very difficult for the microbes to develop resistance.

Blue light can be safely used continuously.

- While blue light energy doses required to kill microbes in biofilm form are higher than with non-biofilm forms, you can use Biovitae throughout the day without risking people or equipment. This allows you to gradually eliminate the biofilms on surfaces and then keep them from forming again.



It is estimated that 65-80% of all infections are caused by microbes in biofilm form.

References

- <https://pubmed.ncbi.nlm.nih.gov/23550978/>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9441148/#cit0004>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6467927/>
- <https://doi.org/10.1016/B978-0-12-374984-0.00154-6>
- <https://doi.org/10.1093/infdis/jiw070>



Competition Analysis

COMPARISON AMONG SANITISING SYSTEMS IN INDOOR ENVIRONMENTS



CHEMICAL SANITISATION
REQUIRES HUMAN INTERVENTION
EFFECTIVE ONLY ON SURFACES
NO USE IN THE PRESENCE OF PEOPLE
HIGH ENVIRONMENTAL COSTS
REQUIRES A SPECIALIST OPERATOR FOR USE
TIME-LIMITED EFFICACY
DOES NOT REQUIRE STRUCTURAL INTERVENTION



HVAC
PASSIVE AND CONTINUOUS SANITISATION
EFFECTIVE ONLY ON AIR
CONTINUOUS ACTION IN PRESENCE OF PEOPLE
HIGH ENVIRONMENTAL AND MAINTENANCE COSTS
HIGH ENERGY CONSUMPTION
EFFICACY WHILE IN USE
STRUCTURAL INTERVENTIONS FOR INSTALLATION

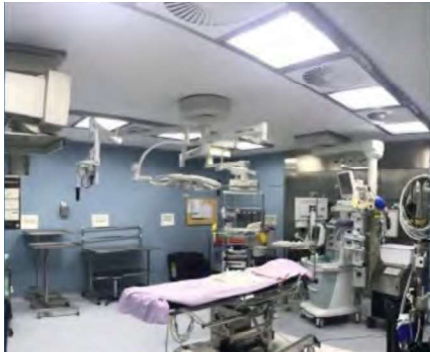


BIOVITAE
PASSIVE AND CONTINUOUS SANITISATION
EFFECTIVE ON AIR AND SURFACES
CONTINUOUS ACTION IN PRESENCE OF PEOPLE
LOW ENVIRONMENTAL AND MAINTENANCE COSTS
NO ADDITIONAL ENERGY
CONTINUOUS EFFICACY OVER TIME
PLUG&PLAY NO STRUCTURAL INTERVENTION

REFERENCES

INSTALLATIONS 1/3

HEALTHCARE



Montevergine Hospital- Operating Room- Cardiology Department
Campania



IDI Istituto Demopatico dell'Immacolata-
Rome



Outpatient clinic - Court of Auditors



ADR- Rome Fiumicino Airport
Emergency Hospital

EDUCATION



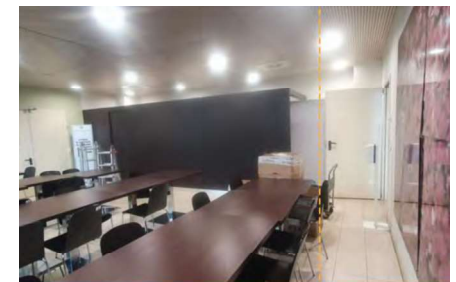
St. Walburg Elementary School - Germany



Moscato High School - Sant'Antimo, Italy



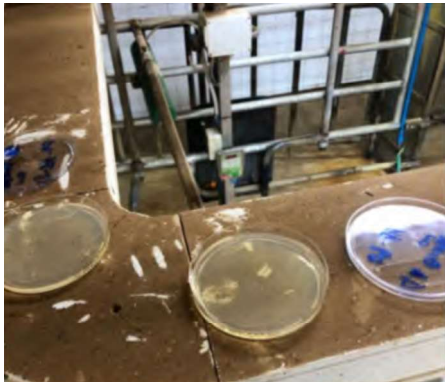
University Of Camerino - Italy



University Polyclinic Campus Biomedico

INSTALLATIONS 2/3

LIVESTOCK AND FOOD PROCESSING



Buffalo Stable - De Vivo Agriculture factory- Milking- Italy



La Granda Factory- Genola, Italy



Irish Piggery



Dairy Torricelle- De Vivo Agriculture factory- Salerno, Campania

OFFICES



Baxter Headquarter - Rome



Prefecture - La Spezia



Lazio Innova Innovation Hub - Viterbo

INSTALLATIONS 3/3

COMMERCIAL AND SPORT



Lavazza Flagship Store - London



La Cooperativa - Cortina D'Ampezzo



COOP- Bologna, Italy



Sampdoria's Dressing Room - Genova


Certifications, Patents & Awards

BIOVITAE®

Certifications, Patents & Awards

PATENTS GRANTED

- 

ITALY
IT102016000078746
- 

INDIA
382960
- 

USA
US11,041,592 B2
- 

JAPAN
7012071
- 

SOUTH KOREA
KR10-20197005500A
- 

AUSTRALIA
2017302211
- 


BRAZIL
11 2019 001628 7
- 


ITALY
IT102016000036840
- 


ITALY
IT201800005509
- 


ITALY
02017000047217

PATENTS PENDING

- 

EPO
17787268.6
- 

RUSSIA
2019105465
- 

EPO
17730282.5
- 

ITALY
102023000004932

CERTIFICATION AND CONFORMITY



AWARDS



Best Innovation
2019



Best Innovation
2020



Best Innovation
2020



Best Innovation
2021



Best Innovation
2023



Best Startup
2023

SCIENTIFIC PARTNERS & COLLABORATIONS



The International Centre for Genetic Engineering and Biotechnology (by UNIDO)



Le Commissariat à l'énergie atomique



Scientific Department Italian Military Army



Swedish Defence Research Agency



Bundeswehr Institute of Microbiology Germany



Technical Research Centre of Finland



Centro Italiano Ricerche Aerospaziali



Italian national agency for new technologies, energy and sustainable economic Development



Fondazione Politecnico di Milano



SAPIENZA UNIVERSITÀ DI ROMA



UNIVERSITÀ CATTOLICA del Sacro Cuore



UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II



UNIVERSITÀ DEGLI STUDI DI SALERNO



CIHEAM intergovernmental organisation for agriculture and nutrition security

BIOVITAE®

THE LIGHT THAT PROTECTS



PATENTS AND
TECHNOLOGIES

P&P PATENTS AND TECHNOLOGIES S.R.L.

Via della rotonda 36 00186 Roma
Tel.+39 (0)6 69322721
Info@p-ptech.lt



NEXTSENSE S.R.L.

Via della Rotonda 36 00186 Roma
Tel.+39 (0)6 69322721
info@nextsense.it

www.biovitae.it