



NEELBHASMI



The efficacy of NeelBhasmi in inactivating novel corona virus (SARS-CoV-2) has been certified by the ICMR approved lab at ESIC Medical College, Hyderabad.



Neelbhasmi

A UVC light-based wide-area sanitization device made by M/s Research India, Bhopal based on the technology developed at Raja Ramanna Centre for Advanced Technology (RRCAT), Indore, a unit of Department of Atomic Energy, Govt. of India.





Proven UV-C Technology

NeelBhasmi inactivates novel corona virus (SARS-CoV-2) as well as microorganisms including the most resilient ones like *P. aeruginosa*, *MRSA*, *E. coli*, *S. aureus* etc.

No More Harsh Chemicals

Eliminates the need for chemical disinfection and disposal of biohazardous waste and allows the complete disinfection of items that are typically forgotten or “impossible” to clean

Rapid Disinfection

NeelBhasmi 's UV-C light can disinfect surfaces of various objects in minutes.

Easy to Use

NeelBhasmi being a plug and play device can be operated by anybody. Further, being fitted with a mobile trolley it can be moved easily anywhere in a room.

The “NEELBHASMI” is an Ultraviolet C (UVC) radiation based mobile sanitization system which uses single-wavelength 254 nm UV-C light generated by low-pressure mercury lamps. The device is intended for remotely decontaminating the air as well as the surfaces of various objects inside a room at research centers, hospitals, doctors’ offices, or any other places of work. It offers multiple degrees of freedom of the UV-C sources and thus provides very efficient utilization of the UV-C radiation for sanitization. The product has a height-adjustable central vertical tower whose top end is attached with four moveable arms, each fitted with two UV-C lamps (each of UV power of 13 W), facing opposite sides. Each of the arms can be moved between 0 and 360 degree with respect to its own axis and also at any angle between 0 and 145 degree with respect to the vertical tower thereby allowing the user to maximally illuminate surfaces of any orientation, horizontal, vertical or inclined, for efficient sanitization. The height adjustability of the vertical tower further allows the user to place the lamp from the target surface as close a distance as possible so as to be able to sterilize it in a minimum time. The bottom end of the vertical tower is mounted on a solid metallic base having sturdy swivel castors wheels that provide the system the desired mobility to move across the room. The UV-C lamps of the device can be remotely switched on and off from outside the room (where it is to be used) so as to cause no exposure of UV-C radiation to the operator. The timer provided with the system allows one to set the time duration over which the lamps are required to remain switched on for the purpose of sterilization. The motion sensor of the device will immediately switch off the lamps in case any inadvertent movement by any person inside the room takes place when the system is in use.



Typical Exposure time requirements:

The NEELBHASMI is capable of sanitizing surfaces kept within one-meter distance from the tower in about 5 minutes.

The following table provides the required time of UV-C exposure for inactivating SARS-CoV-2 (by 90 %) on surfaces of different areas.

Area	Exposure time
12 ft x 12 ft	35 min
10 ft x 10 ft	20 min
7.5 ft x 7.5 ft	15 min
5 ft x 5 ft	10 min

For the estimation of the exposure time required for decontaminating surfaces of different areas, the NeelBhasmi was positioned with its four arms stretched out orthogonal to each other at a height of 7 ft above the ground and the irradiance of the UVC light on the ground at various distances from the NeelBhasmi tower was measured. The exposure time was then calculated considering the required irradiation dose for inactivating SARS CoV-2 as 1.5 times the mean dose, reported in literature*, for inactivating members in the corona virus family.

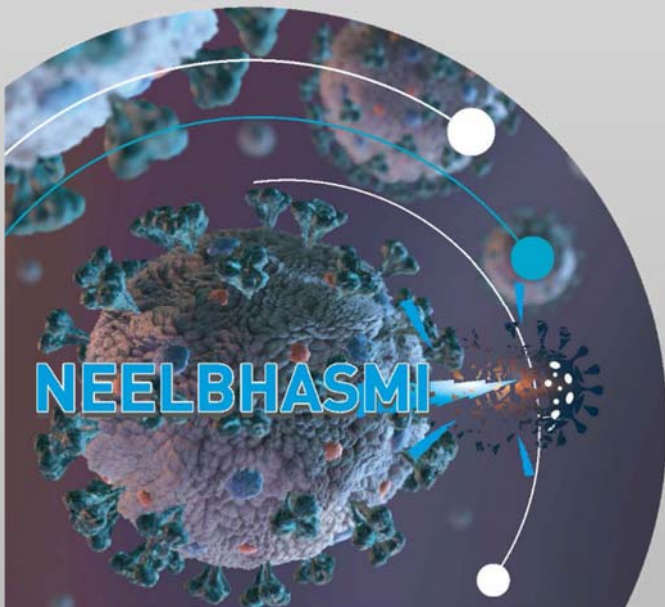
(*Fluence (UV Dose) Required to Achieve Incremental Log Inactivation of Bacteria, Protozoa, Viruses and Algae Revised, updated and expanded by Adel Haji Malayeri¹, Madjid Mohseni, Bill Cairns² and James R. Bolton)

The best solution for surface disinfection in the following environments

- laboratories
- hospitals
- dental clinics
- veterinary clinics
- nursing homes
- cleanrooms
- food industry
- grocery stores
- restaurants and kitchens
- schools and day care centres

Standard Model

Model No.	PART NO.	MRP (in ₹)
RI TUV	RINB-SE	1600000.00



NEELBHASMI



Performance of Neelbhasmi

The efficacy of NeelBhasmi has been tested on the bacteria *Pseudomonas aeruginosa*. The count of *Pseudomonas* was found to decrease by three log (i.e. by 99.9%) in ~30 min under UVC radiation from NeelBhasmi kept at distance of ~10 ft.

The efficacy of NeelBhasmi in inactivating SARS-Cov-2 (the virus responsible for COVID-19) with the use of UV-C radiation is not known yet. In fact, there is no published report worldwide, as on date, of any systematic research specifically looking at how UV-C affects SARS-CoV-2. However, based on the evidence provided by the vast body of literature of the efficacy of UV-C light in causing high level of inactivation (~99.9%) of other coronaviruses including two of the near-relatives of SARS-CoV-2, namely, MERSCoV and SARS-CoV-1, and also based on the recent observation of the researchers at Columbia University, USA (<http://www.mta.info/press-release/mtaheadquarters/mta-launches-first-ever-pilot-uvc-proven-kill-covid-19>), it is believed by the International Ultraviolet Association (IUVA) that disinfection using UVC radiation at an appropriate dose will inactivate SARS-Cov-2.

Product Specifications

Model	RI TUV
Number of Lamps	16
Electrical Power (watts/lamp)	30 W
UV-C Output (watts/lamp)	13 W
Total Lamp Life: (Hours)	36,000
Wavelength	254 nm
Remote Control	RF remote
Connectivity	10 m
Number of arms	8
Lamps per arm	2
Lamp Control	Independent on-off control for lamps on each arm
Arm Length	930 mm
Arm Rotation	360 degree
Arm Tip/Tilt	0-145 degree
Azimuth / Elevation	± 20 degree
Switch	8
Illumination angle	0 – 145 degree
Adjustable Height (mm)	1450 – 2000
Height Adjustment Mechanism	Rack & Pinion
Portable	Yes
No of Wheel	4
Lockable Wheels	2
Sterilizing Timer	Programmable (0 – 6hrs)
Safety Sensor	IR (180°)
Detection Range	10 m
Power Supply	230VAC, 50 Hz
Total Power consumption	300 W
Weight	60 Kg

Warning:

NeelBhasmi emits UV-C radiation which is harmful to humans. Do Not enter the room or come near NeelBhasmi when it is in use. Avoid Direct Exposure to UV-C, especially skin and eyes



भारत सरकार

Government of India

परमाणु ऊर्जा विभाग

Department of Atomic Energy

राजा रामन्ना प्रगत प्रौद्योगिकी केन्द्र

Raja Ramanna Centre for Advanced Technology

लेसर ग्रुप

Laser Group

Sep 14, 2020

This letter is being issued to certify that NeelBhasmi - the UV based area sanitization device for inactivating various micro-organisms (including corona viruses) - designed and developed by Raja Ramanna Centre for Advanced Technology (RRCAT), Indore under Department of Atomic Energy, Govt. of India, and manufactured by M/s Research India, Bhopal following its technology transfer was subjected to test at the BSL-3 Laboratory in ESIC Medical College, Hyderabad for evaluating its efficacy of disinfection against SARS-CoV2 and was found to inactivate the SARS-Cov2 viruses from the surfaces of different materials.

Date of test: 4 Sep. 2020

Device under test: NeelBhasmi (Model: TUV, Research India).

Method: The device was kept inside the BSL-3 laboratory with an area of 140 sq. ft. having a height of 10 feet. Different materials like glass, plastic cover, paper and cloth which were impregnated with SARS-CoV2 taken from the Viral Transport Medium from a confirmed COVID-19 positive sample (Ct value of 22) and were kept at various distances and heights from the apparatus. A total of 20 specimens were kept. After exposure to UV-C radiation for 90 minutes, swabs were collected and tested for virus using RT-PCR. Presence of E gene and ORF gene was investigated in all the samples.

Result: The genes were not detected in any of the samples.

(Shri S. V. Nakhe)

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