



UNIVERSITA' DEGLI STUDI DI MILANO
Cattedra di Immunologia
Dipartimento di Scienze Biomediche e Cliniche L. Sacco
Via G.B. Grassi, 74 - 20157 Milano
Tel. +39 02 503 19678-9
Fax +39 02 503 19677
e-mail: mara.biasin@unimi.it, daria.trabattoni@unimi.it

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SARS-CoV-2 STERILISATION TEST REPORT WITH UV-C LAMP BY SONUS AUDIO SERVICES SRL UNIPERSONALE

It is known that a given range of electromagnetic radiation, which falls within the UV light band, is able to neutralize the replication of several pathogens, including SARS-CoV-2 (<https://doi.org/10.1101/2020.06.05.20123463>; doi: <https://doi.org/10.1101/2021.05.28.21257989>).

The Immuno-Biology Laboratory of the Department of Biomedical and Clinical Sciences "L-Sacco" of the University of Milan will test the sterilization capacity of the **U-PROTECT sanitising lamp** on behalf of **SONUS AUDIO SERVICES SRL UNIPERSONALE** Company, against the SARS-CoV-2.

U-PROTECT sanitising lamp is provided with an UV-C LED source capable of emitting electromagnetic radiation possibly able to inhibit and inactivate SARS-Cov-2 deposited on contaminated surfaces.

- **Objective**

To verify the sanitising capacity of the U-PROTECT SANITISING LAMP on surfaces contaminated with SARS-CoV-2.

- **Experimental test procedure**

- ✓ The virus with an established concentration (0.05 MOI) was deposited, in its culture medium (946 µl DMEM), on a surface supplied by the customer;

- ✓ The contaminated surface was then exposed to the UV-C lamp for 150 seconds;

- ✓ After UV-C irradiation, the virus was recovered (200 µl) and inoculated in a Vero-E6 cell culture (2×10^5 cells) to verify its replication ability by an *in vitro* infection assay.

- ✓ After 1 hour of infection, cells were washed to remove the residual virus from cell culture and viral replication was assessed 24 and 72 hours post-infection by sampling 200 µl of cell culture supernatant and amplification of two distinct SARS-CoV-2 gene sequences (N1 and N2) in Real Time PCR.

The same experimental procedure was performed to test a virus-contaminated surface not exposed to UV-C as a positive control.

All tests were carried out in duplicate.



Test results

Data analysis obtained under the different experimental conditions are reported below.

The graphs below show the analysis regarding data at 24h post-infection. The analyses were conducted using a SARS-CoV-2 dose of 0.05 MOI comparable to the average concentration present in the swab of an infected patient (Figure 1).

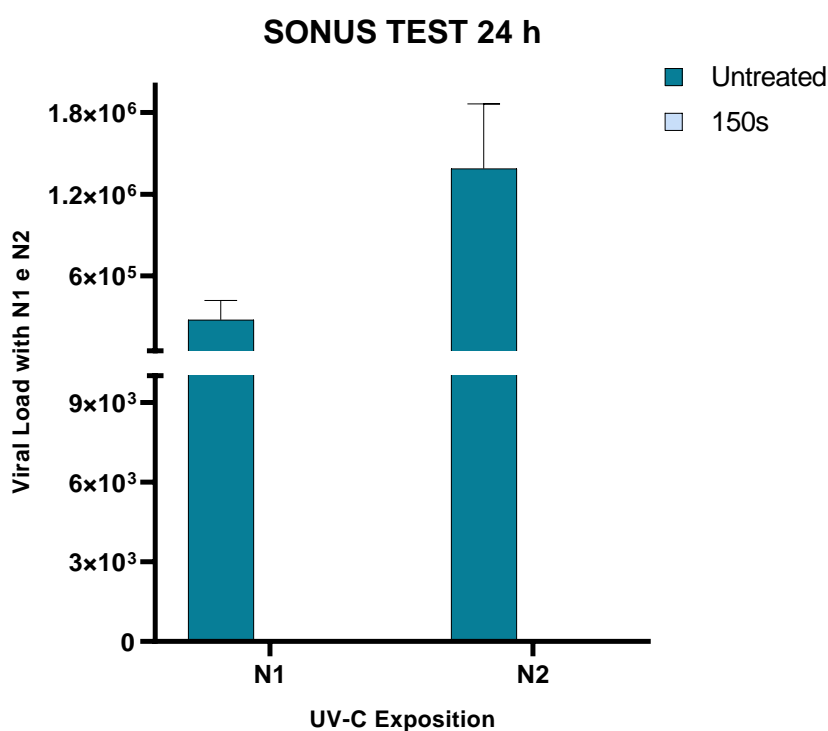


Figure 1. Monitoring of SARS-CoV-2 replication (0.05 MOI) on contaminated and UV-C irradiated surfaces via the device provided by the SONUS AUDIO SERVICES SRL UNIPERSONALE Company 24 hours post infection:

The selected surface has been contaminated with a known amount of Virus and exposed to UV-C irradiation via the U-PROTECT sanitising lamp for 150 seconds. At the same time an untreated sample was prepared as a positive control. Viral replication was evaluated 24 hours after infection. The graph shows viral copy number quantified by analysing the N1 and N2 viral sequences of SARS-Cov-2 in Real-Time PCR. As a result of UV-C irradiation, a reduction of the viral load of more than 99,9% was observed compared to the positive control.



Later, we evaluated viral replication at 72 hours post infection.

Analyses were carried out using a 0.05 MOI dose of SARS-CoV-2 (Figure 2).

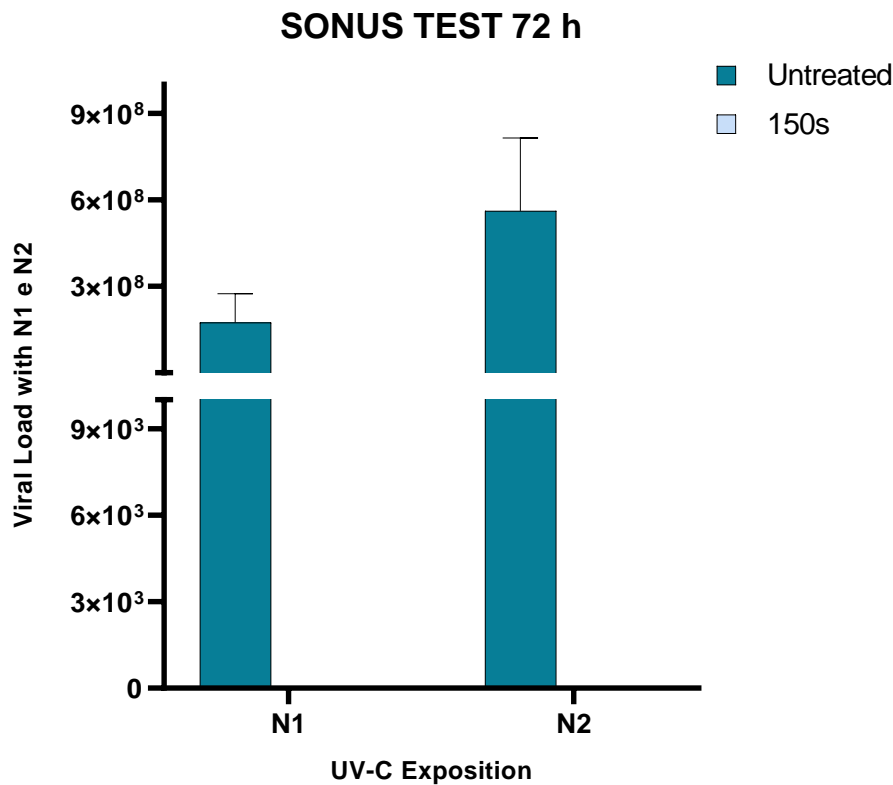


Figure 2. Monitoring of SARS-CoV-2 replication (0.05 MOI) on contaminated and UV-C irradiated surfaces via the device provided by the SONUS AUDIO SERVICES SRL UNIPERSONALE Company 72 hours post infection:

The selected surface has been contaminated with a known amount of Virus and exposed to UV-C irradiation via the U-PROTECT sanitising lamp for 150 seconds. At the same time an untreated sample was prepared as a positive control. Viral replication was evaluated 72 hours after infection. The graph shows viral copy number quantified by analysing the N1 and N2 viral sequences of SARS-Cov-2 in Real-Time PCR. As a result of UV-C irradiation, a reduction of the viral load of more than 99,9% was observed compared to the positive control.

Final comment

U-PROTECT SANITISING LAMP from the company SONUS AUDIO SERVICES SRL UNIPERSONALE is a device equipped with Leds capable of emitting UV-C radiation able to sanitize surfaces contaminated by viral particles. With the exposure times indicated by the customer, the device is able to inhibit more than 99,9% of SARS-Cov-2 viral load (0.05 MOI). The effect detected at 24 hours was confirmed even after 72 hours of infection suggesting that the inhibitory effect is maintained over time.