

## Experimental evaluation of microbial characteristics of surfaces of Nanofug® Premium der Co. PCI Augsburg GmbH

### **Evaluated specimen:**

Nanofug® Premium of Co. PCI Augsburg GmbH

### **Test conditions:**

Series of measurement with illuminated specimens, irradiation intensity was 0.85-0.95 mW/cm<sup>2</sup> UV-A-radiation (Philips TL-D 18W 108).

Exposed samples and samples kept in the dark were compared in all the test series.

The tests were conducted at a room temperature of 21°C, the relative humidity in the test chamber was adjusted to 50 %.

### **Test organisms:**

*Sarcina lutea* (occur ubiquitously, generally being distributed by air currents) and *Aspergillus niger* (spore building common fungi)

Concentration of microorganisms:

*Sarcina lutea*: 1,000,000 bacterial cells (*Sarcina lutea*) on an area of about 20 cm<sup>2</sup>

*Aspergillus niger*: 10,000 fungal cells (*Aspergillus niger*) on an area of about 20 cm<sup>2</sup>

Replicas were conducted due to validation purposes

### **Results**

#### **Gram-positive bacterial strain *Sarcina lutea*:**

Using an initial number of 1,000,000 bacterial cells (*Sarcina lutea*) on an area of about 20 cm<sup>2</sup> (Figure 1) of Nanofug® Premium, the majority of the cells is still viable after 12 hours in the dark (Figure 2).

There are no reproducible cells detectable on the exposed specimen of Nanofug® Premium (Figure 3). Their

development is strongly inhibited. Recultivation can be detected after extended incubation periods.

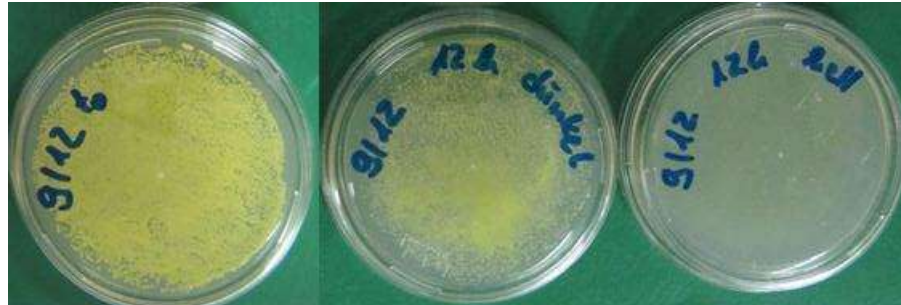


Figure 1

Figure 2

Figure 3

It was not possible to demonstrate a substantial inactivating effect of the samples. The results show that a reduction in the rate of multiplication occurs. In the case of continuous exposition, repeated exposure takes place; it is therefore probable that bacterial growth is reduced.

#### **Fungal cells *Aspergillus niger*:**

Using an initial number of 10,000 Pilzzellen (*Aspergillus niger*) on an area of about 20 cm<sup>2</sup> of Nanofug® Premium, the majority of the cells is still viable after 7 days in the (Figure 4, top row).

There are almost no reproducible cells detectable on the exposed specimen of Nanofug® Premium (Figure 4, bottom row).

Reduction factor of cells was 3 to 4 after several days of exposure.

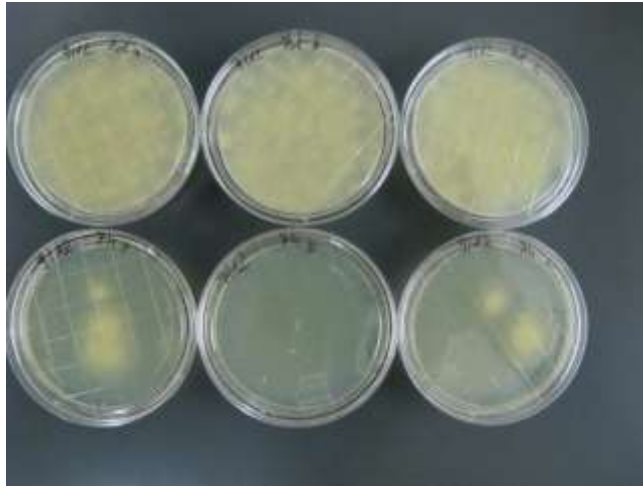


Figure 4

**Conclusion:**

In the case of continuous exposition, repeated exposure takes place; it is therefore probable that bacterial growth of the chosen test strains won't reproduce and will, with high probability, be inactivated.

*Results from measurement series in February 2013,  
conducted at Fraunhofer Institute of Interfacial Engineering  
and Biotechnology, Stuttgart*