

TECHNICAL REPORT

For

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Healthier Sciences

SmartShield RTU™ Antimicrobial Surface Protectant
on Computer Touch Screen Medical Monitor.

ISO 22196 - Efficacy Testing
Measurement of Antibacterial Activity on Plastics Surfaces

Analysis performed by

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Sanders Laboratory Number 1101-1807

1. Materials submitted for Testing:

A computer monitor screen material had been received by Sanders Laboratories for ISO 22196 antibacterial activity testing.

A. Both the right and left sides of the monitor had been disinfected with an EPA Registered Hospital Grade Disinfectant. The right side was analyzed as the untreated surface. No additional treatments had been applied to the right side of the screen other than the initial hospital disinfectant.

B. The left side of the monitor had, in addition, been treated with SmartShield RTU™, allowed to dry for 3 minutes and wiped clean.

2. Significance and Use:

This international Standard specifies a method of evaluating the antimicrobial activity of antimicrobial-treated, non-porous plastic products (including intermediate Products). Any results obtained with this International Standard should always refer to this standard and the conditions used. Results obtained with this International Standard indicate antimicrobial activity under the specified experimental conditions used herein, and do not reflect activity under other circumstances where a variety of factors, such as temperature, humidity, different bacterial or mold species, nutrient conditions, etc., have to be considered. A minimum diffusion of the antimicrobial agent/chemicals into the test inoculum is normally necessary with this procedure.

3. Procedure:

Pre-culture of bacteria. The MRSA *Staphylococcus aureus* (ATCC #6538) was cultured on BHI (Brain Heart Infusion) Agar slants from the laboratory stock cultures. After 24 hours of cultivation, it was transferred to a second BHI Agar slant and cultured for an additional 22 hours.

Preparation of test specimens: The plastic monitor screen sample was not touched. The monitor body was handled with latex gloves to prevent finger prints. The use of heat or alcohol sterilization was avoided as the surface coating may have been compromised.

Inoculation of the test specimens: Four aliquots of 0.4mL each of the test inoculum were placed on the untreated treated surface of the monitor screen. Another four aliquots of 0.4 mL each of the test inoculum were placed on the treated surface of the monitor screen. The MRSA *Staphylococcus aureus* inoculum had a viable count of 3.5×10^6 cfu/mL (1,400,000 cfu/0.4 mL).

A 20mm x 20mm square sterile film (2/1000 inch thick) was placed upon each 0.4 mL drop to prevent evaporation and maintain equal test exposure areas of 4 cm²

(350,000 cfu/cm²). A petri dish lid was placed over each testing site to help prevent evaporative losses.

Incubation of the inoculated test specimens: Each sample was incubated at room temperature of 75° F (24° C) for 2 hours, 6 hours and 24 hours. Each sample was then washed with 1 mL of phosphate buffer and pour plate counts were determined.

<u>Sample ID</u>	<u>cfu/cm²</u>	<u>% Kill</u>	<u>Antibacterial Activity</u>
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Staphylococcus aureus

Untreated Monitor

Initial count	350,000	---	---
2 hour count	250,000	28.57	0.14
6 hour count	100,000	71.43	0.54
24 hour count	16,000	95.43	1.34

Treated Monitor

Initial count	350,000	---	---
2 hour count	3,900	98.89	1.95
6 hour count	2,300	99.34	2.18
24 hour count	19	99.99	4.26

Calculate the “Antibacterial Activity”: This is the difference in the logarithm of the viable cell count found on an antimicrobial-treated product and an untreated product after inoculation with and incubation of the bacteria. The following equation is used: $R = (U_t - U_o) - (A_t - U_o) = U_t - A_t$

Where: R = the “Antibacterial Activity”

U_o = the average of the common logarithm of the number of viable bacteria (bacteria/cm²) recovered from the untreated test specimens immediately after inoculation.

U_t = the average of the common logarithm of the number of viable bacteria (bacteria/cm²) recovered from the untreated test specimens after 2 hours, 6 hours and 24 hours of incubation.

A_t = the average of the common logarithm of the number of viable bacteria (bacteria/cm²) recovered from the treated test specimens after 2 hours, 6 hours and 24 hours of incubation.

<u>Antibacterial Activity</u>	<u>% Kill Compared to control</u>	<u>Comment</u>
<1.5	<96.8	poor
1.5 to 2.0	96.8 to 99.0	borderline
2.0 to 3.0	99.0 to 99.9	good
>3.0	>99.9	excellent

4.0 Conclusions:

- A. SmartShield RTU™ exhibited excellent antibacterial activity the first time MRSA *Staphylococcus aureus* was exposed to the coating on the left "treated half" of the monitor screen.
- B. The hospital only treatment on the right "untreated half" of the monitor screen exhibited poor antibacterial activity the first time MRSA *Staphylococcus aureus* was exposed to the monitor screen.