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Final Report for:

Mermet

58 chemin du Mont Maurin
F-38630 Veyrins-Thuellin

Test Method:

ASTM E 2180-07(2012)

Standard Test Method for Determining the Activity of Incorporated
Antimicrobial Agent(s) in Polymeric or Hydrophobic Materials

MSL Project# R2014-17

Sample Received: 1/16/14

Testing Initiated: 1/23/14

Testing Completed: 1/27/14

Report Issued: 1/27/14

Performed By: *Agata Shulfer*
Title: Technical Lead

Approved By: *Debbie Koester*
Title: Lab Supervisor





Objective:

To evaluate the surface of two samples for antimicrobial effectiveness against *Staphylococcus aureus* ATCC# 6538 as demonstrated by ASTM E 2180 test method.

Test Sample Description:

1. Screen Nature- SN
2. Screen Nature Ultimetal- SNU
3. MicroStar plastic control was used as the untreated control.

The untreated plastic control was an inert polyester panel supplied by MicroStar. Samples were suitable for ASTM E 2180 testing. Each sample was tested in triplicate.

The submitted samples were fabric materials. The samples were received as 8" x 10" pieces. Three squares measuring 3cm x 3cm were aseptically cut from the larger sheet and used for testing.

Procedure:

The inoculum was prepared using *Staphylococcus aureus* ATCC# 6538, which was adjusted using a spectrophotometer to a concentration of $1-5 \times 10^8$ CFU/mL using a phosphate buffer solution. One (1.0) mL of the standardized culture was added to 100 mL of prepared molten agar slurry held at 48°C, giving a final inoculum concentration of $1-5 \times 10^6$ CFU/mL. The untreated plastic control was tested in triplicate at Time = 0 and Time = 24 hours. The treated samples were tested in triplicate at Time = 24 hours. One (1.0) mL of the inoculum was pipetted evenly onto a 3.0 cm by 3.0 cm area of each test piece. The agar slurry was allowed to gel and the samples were placed in sterile sample bags and incubated at $35 \pm 2^\circ\text{C}$ for contact times of 0 hour and 24 hours. At the appropriate contact time, DE neutralizing broth was added to each sample bag in a 1:10 dilution. Each sample was then sonicated for 1 minute followed by 1 minute of massage to facilitate the release of the agar slurry overlay from the sample surface and into the neutralizing broth. Serial dilutions of the neutralizing broth containing the disrupted agar inoculum were plated using Tryptic Soy Agar. The plates were incubated for 48 hours at $35^\circ\text{C} \pm 2$. After incubation, colony numbers were counted and any reductions in the number of bacteria were calculated.

Please note that the T=0 is somewhat of a misnomer in that the agar slurry must solidify and then be removed so there is about 10 minutes of contact time during that process.





Test Results:

Results can be found in the data table below. The results pertain only to samples tested.

The number of viable bacteria in the test inoculum agar slurry was 1.0×10^6 CFU/mL (1,000,000 or log value 6.00). This is the initial number of bacteria of the starting inoculum.

Results

Sample	Geometric Mean of Recovered Bacteria (Log Value)	Log Reduction at Time = 24 hours	Percent Reduction at Time = 24 Hours
Untreated Plastic Control at Time = 24 Hour	6.03		
Screen Nature- SN at Time = 24 Hour	3.42	2.61	99.8 %
Screen Nature Ultimetal- SNU at Time = 24 Hour	2.86	3.17	99.9 %

- The test sample: Screen Nature- SN had a 99.8 % reduction in the bacterial population as compared to the untreated control after 24 hours. This is between 2 and 3 log reduction.
- The test sample: Screen Nature Ultimetal- SNU had a 99.9 % reduction in the bacterial population as compared to the untreated control after 24 hours. This is a 3 log reduction.
- Percent reduction is determined by comparing the treated sample after the contract time to the untreated plastic control after the contact time using the geometric mean and antilog as indicated by the standard test method.

Percent reduction is translated into log reduction by the following:

90% reduction = 1 log reduction; i.e. 1,000,000 (Log Value 6.00) reduced to 100,000 (Log Value 5.00)

99% reduction = 2 log reduction; i.e. 1,000,000 (Log Value 6.00) reduced to 10,000 (Log Value 4.00)

99.9% reduction = 3 log reduction; i.e. 1,000,000 (Log Value 6.00) reduced to 1,000 (Log Value 3.00)

99.99% reduction = 4 log reduction; i.e. 1,000,000 (Log Value 6.00) reduced to 100 (Log Value 2.00)

