FINAL REPORT

Determining the Activity of Incorporated Antimicrobial Agents

PROTOCOL
Modified ASTM E2180

ORDER Number
371115057

PREPARED FOR:

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Certificate of Analysis

Client: Gamet S.A.

Contact: Michal Rakowski
Project: ASTM E2180 Bacterial Resistance

Product : Door coatings
EMSL NO: 371115057

Sample received: 10/27/2011
Start date: 11/2/2011
Report date: 11/7/2011
Challenge Bacteria: Gram Negative – *Pseudomonas aeruginosa* ATCC 27853

Experimental Summary: The testing procedure was designed after discussions between EMSL Analytical, the testing company, and the client, Gamet, S.A. The testing procedure is based on ASTM E2180, with the testing conducted on door handle coatings submitted by Gamet for their ability to reduce bacteria. The testing was conducted in our Cinnaminson, NJ Microbiology Laboratory.

Procedure:

E2180:

Culture preparation: *Pseudomonas aeruginosa* (*P. aeruginosa*) was observed for the determination of antimicrobial efficacy of the different door coatings; brushed, satin and gloss. Cells were first plated onto tryptic soy agar (TSA) and incubated at 35°C for 24 h. A well isolated colony was then taken and placed into 10 mL of tryptic soy broth (TSB) and incubated as stated above. After 24 h incubation 1 mL of the bacterial solution was placed into a separate bottle of 99 mL Agar slurry (0.3% agar and 0.85% NaCl), resulting in a concentration of ~$1.0x10^7$ cfu/mL.

Innoculation of Test Material: Individual test material was placed in standard 100 x 15mm Petri dishes and inoculated with 1 mL of the bacterial solution, prepared as stated above. Simultaneously, six control non-coated metal coupons were similarly prepared and inoculated. Three of the control coupons were immediately recovered and plated out as stated below to determine the starting population. Each Petri dish from the test material and control material was then wrapped with plastic wrap, to avoid evaporation (dehydration), and incubated at 35°C for 24 h.

Recovery of Test Organism: Following incubation the entire inoculated test material was removed with pre-sterilized forceps and washed with 10 mL of phosphate buffer in the same Petri dish. The wash was then removed with a pipette and placed into a sterile 15mL centrifuge tube. The wash solution was then vortexed for 30 seconds to mix all bacterial cells into solution, and then serial diluted. Respective dilutions were plated onto Tryptic Soy Agar + 5% Sheep Blood (TSAB) and incubated at 35ºC for 24 h before colonies were counted. All tests were completed in triplicate.

Experimental Results:

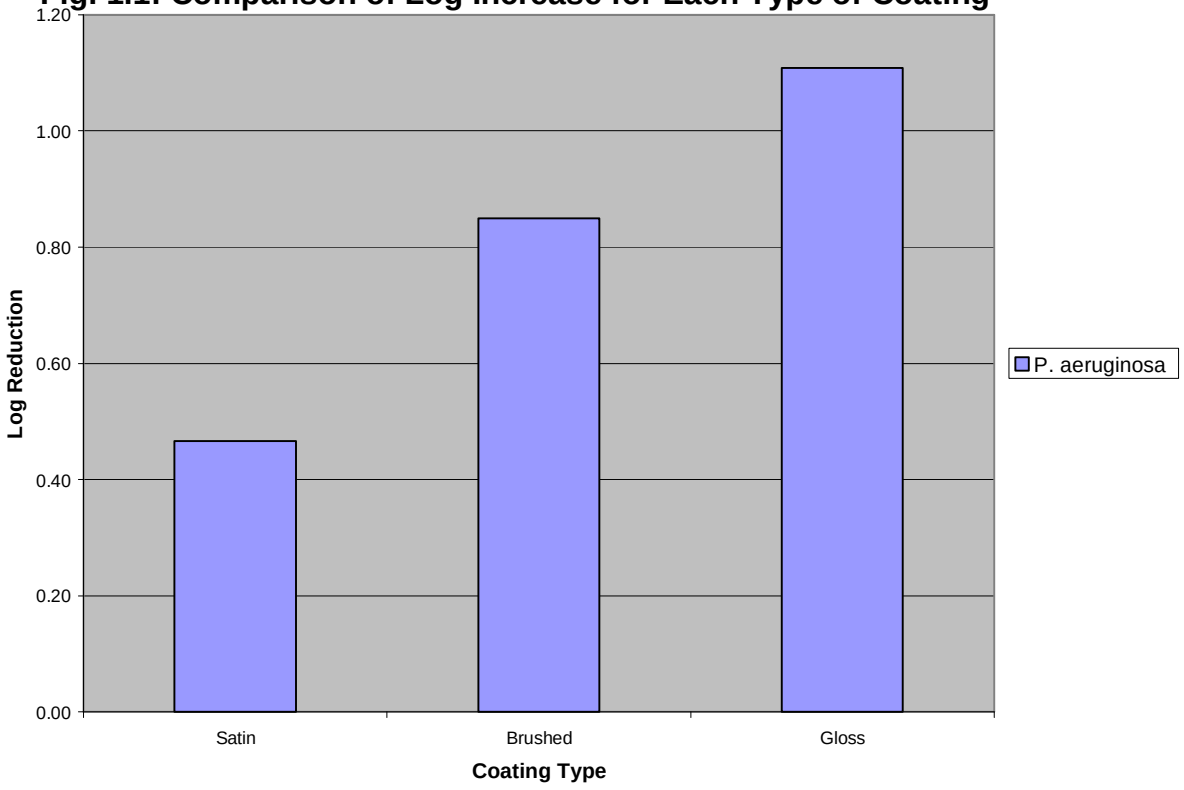
Table 1.1

P. aeruginosa	Time (hours)	Average CFU/ml	Log10/CFU	Log Reduction	%Reduction
Control	0	$5.13x10^7$	7.71	N/A	N/A
	24	$6.50x10^7$	7.81		
Satin Coating				0.47	65.77%
	24	$1.76x10^7$	7.24		
Brushed Coating				0.85	85.84%
	24	$7.27x10^6$	6.86		
Gloss Coating				1.11	92.21%
	24	$4.00x10^6$	6.60		

N/A = not applicable since the control increased in population

% Reduction = difference between Log10/CFU after 24 h – Log10/CFU after 0 h

Fig. 1.1: Comparison of Log Increase for Each Type of Coating



Conclusions/Observations:

The three different door knob coatings sent in by Gamet, S.A. were tested using ASTM E2180 protocol to determine the activity of incorporated antimicrobials against *P. aeruginosa* ATCC 27853. After 24 h contact time it was observed that the gloss coating produced the largest log reduction (1.11), followed by the brushed (0.85) and satin (0.47) coatings as shown in Fig. 1.1.

In conclusion, the three coating types tested demonstrated the ability to reduce the amount of *P. aeruginosa* ATCC 27853 when exposed for 24 h. The gloss coating was observed to demonstrate the greatest percent reduction of 92.21%.

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