Test Facility
9 Morgan
Irvine, CA 92618
949.951.3110

STUDY TITLE

ANTIMICROBIAL SPECIAL - Modified ASTM E2180: Standard Test Method for Determining the Activity of Incorporated Antimicrobial Agent(s) in Polymeric or Hydrophobic Materials, Inoculum Control Method

SPONSOR

Becky Hudock
Forbo Flooring Systems NA
8 Maplewood Drive
Hazleton, PA 18202

TEST ARTICLE NAME

Marmoleum

TEST ARTICLE IDENTIFICATION

Not Supplied

TEST ARTICLE PHYSICAL DESCRIPTION

Linoleum flooring

TEST ARTICLE RECEIVED

May 1, 2013

PURPOSE

The purpose of this study was to evaluate (quantitatively) the antimicrobial effectiveness of agents incorporated onto hydrophobic or polymeric surfaces.

RESULTS

	K. pneumoniae CRE BAA-1705			
	Counts	Mean	Percent Reduction (%)	Log Reduction
Sample ID	24hr			
Marmoleum	$< 1.00 \times 10^2$	$< 1.00 \times 10^2$	> 99.99	4.52
Replicate	$< 1.00 \times 10^2$			
Replicate	$< 1.00 \times 10^2$			

	K. pneumoniae CRE BAA-1706			
	Counts	Mean	Percent Reduction (%)	Log Reduction
Sample ID	24hr			
Marmoleum	$< 1.00 \times 10^2$	$< 1.00 \times 10^2$	> 99.99	4.53
Replicate	$< 1.00 \times 10^2$			
Replicate	$< 1.00 \times 10^2$			

CACULATION

Mean = (X1 + X2 + X3) / 3

Where:

X = number of organisms recovered from the incubation period (24hr) treated samples

Percent Reduction = (a-b) / a * 100, Log Reduction = Log (a) - Log (b)

Where:

a = calculated inoculum population delivered onto each sample

b = mean of the number of organisms recovered from the triplicate incubation period (24hr) treated samples

TEST INFORMATION

Date Test Initiated: 06-03-13	Date Test Ended: 06-11-13	
Test Article:	Marmoleum	
Test Organisms:	*Klebsiella pneumoniae* (CRE) *Klebsiella pneumoniae* (CRE)	Source # BAA-1705 Source # BAA-1706
Sample size:	3.0 cm x 3.0 cm square	
Pre-treatment:	Sample pre-wet with sterile 0.85% saline	
Neutralizer:	100 mL D/E Broth	
Target Starting inoculum concentration:	approximately 1-5 x 10^8 CFU/mL	
Target Final inoculum concentration:	approximately 1-5 x 10^6 CFU/ mL	
Inoculum Population:	*K.pneumoniae* (CRE BAA-1705) 3.30 x 10^6 CFU / mL *K.pneumoniae* (CRE BAA-1706) 3.35 x 10^6 CFU / mL	
Inoculum Carrier:	TSA	
Inoculum Volume:	1 mL	

Study was conducted by following Forbo Protocol 13C_33538_01.

PROCEDURE

Teat articles were individually placed into designated sterile Petri dish. A sterile cotton swab and sterile 0.85% saline (without the inhibitory level of surfactant) was used to pre-wet each test article prior to testing.

Each test article was inoculated with 1.0 mL of the inoculated agar slurry to form a film of no more than 1mm in depth over the entire test article surface. The inoculated agar slurry was allowed to gel and the test articles were placed at 37±2°C incubation for 24±2 hours.

Following the 24 hours contact time, each test article was aseptically transferred to a sterile container and neutralized with 100 mL of D/E broth. Teat articles were vortexed for approximately 1 minute and 10^{-2} to 10^{-5} dilutions were plated in duplicate using molten TSA. Plates were solidified and then incubated at 37±2°C for 48 hours ± 2 hours. After incubation, the number of colonies was verified and the average number of surviving organism for each teat article was calculated. The study was performed in triplicate as indicated in the tables for each test article.

COMMENT

Organisms used for testing are derived from ATCC® organism, or an organism determined to be equivalent. ATCC® is a registered trademark for the American Type Culture Collection.