

For Information Purposes Only

21 April, 2017

Thermoplastic Forms Study - Results Summary

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We have completed our initial bacterial attachment/survival study using the masks that you kindly donated. We would like to share our results for your masks.

Orfit - Item# 35763/2MA/NH (Efficast, Standard 3 pt head mask)

Four different bacteria were used in this study. They included: methicillin resistant (MRSA) *Staphylococcus aureus* (ATCC 29213), *Pseudomonas aeruginosa* (ATCC 27853), vancomycin susceptible *Enterococcus faecalis* (ATCC 29212), and *Escherichia coli* (ATCC 25922).

Each bacterium was separately assayed. A test sample inoculum was prepared by transferring enough isolated microorganism to a tube of sterile saline to approximate a 0.5% McFarland turbidity standard (represents $\sim 1.5 \times 10^8$ bacteria/milliliter). The inoculum was subsequently transferred to the mask surface being distributed in a 2 cm x 2 cm sample square. A control sample consisting of sterile saline without bacteria was similarly applied to the mask surface. This control was done for two reasons. First, to determine if the masks were received with any contaminant(s). Second, to assess the risk of external contamination from open-shelf storage similar to that expected to be used in a radiation therapy facility.

Mask sampling occurred at both one-hour and one week intervals. The one-hour interval determined how many bacteria suspended in sterile saline attached to the mask surface from the starting inoculum number. The one-week sample determined if any attached organisms were capable of surviving during this period. Results of these samplings are shown on the next page in *Figure 1* and *Table 1*.

Overall, our results indicate that there is negligible attachment of any of these bacteria to the provided masks. Additionally, the inability to recover any of these microorganisms after one-week suggests that those bacteria that did attach do not survive for long. On a cautionary note, our results do not imply that the same conclusion can be drawn for other related or nonrelated species. This would require additional testing.

Sincerely,



Terrence J. Ravine, Ph.D.
Associate Professor

Point of contact for questions is Dr. Ravine at travine@southalabama.edu or 251-445-9297.

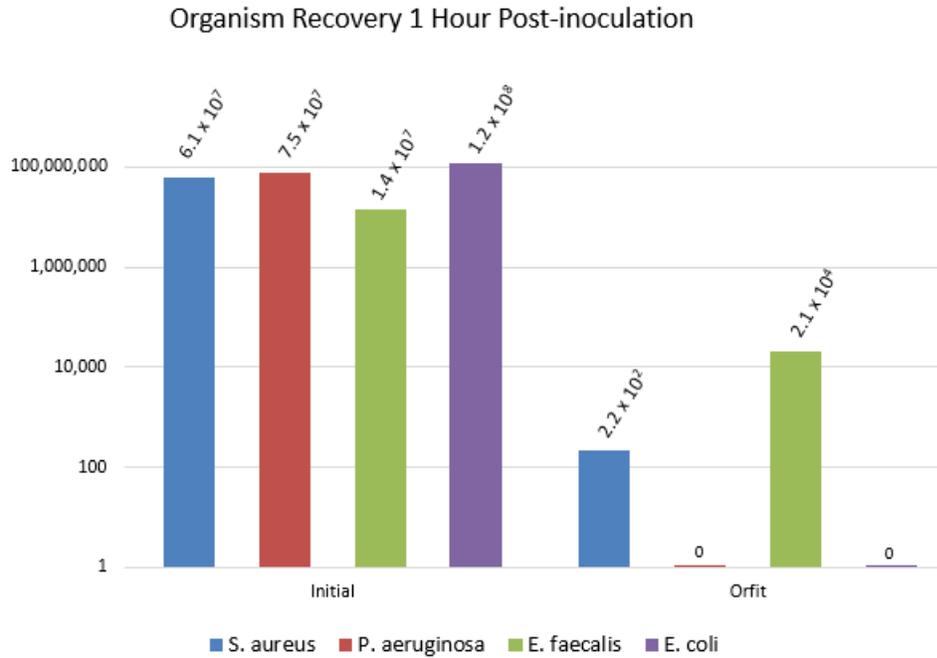


Figure 1. Organism recovery after one-hour attachment period. Numeric labels represent the number of CFU/mL⁻¹ for each tested bacterium. Initial = number inoculated, Orfit = number attached.

Table 1 - Percent (%) reduction of inoculated versus attached microorganisms.

Organism	One-Hour Sampling	One-Week Sampling
<i>S. aureus</i>	99.99%	No growth
<i>P. aeruginosa</i>	100.00%	No growth
<i>E. faecalis</i>	99.99%	No growth
<i>E. coli</i>	100.00%	No growth

100.00% = No attachment

Calculation:

$$\text{Percent reduction} = \frac{\# \text{ Inoculated} - \# \text{ Attached (one-hour)}}{\# \text{ Inoculated}} \times 100$$

Note: This information has been submitted for consideration for publication in a future edition of ASRT's Radiation Therapist.