

**Study Title:** Non-GLP Antibacterial Activity and Efficacy of Folia Materials Fabrics Using the AATCC 100 Method

**Study ID:** NG17693

**Test Microorganisms:** Staphylococcus aureus ATCC 6538, Klebsiella pneumoniae ATCC 4532

**Testing Facility:** Microchem Laboratory, 1304 W. Industrial Blvd. Round Rock, Texas 78681

Folia’s silverized non-woven material is used on the outer coverstock of face masks as an antimicrobial preservative. Different silver levels on Folia silverized non-woven, to determine the minimum loading required to pass various criteria.



**Test Method:**

- Standard: AATCC-100
- Sample swatches cut to ~ 4.8 cm in diameter and stacked with 4 swatches/stack in individual, sterile, petri dishes

**Results: >4 Log<sub>10</sub> Reduction**

| Sample Ag%      | S. aureus ATCC 6538 |                 | K. pneumoniae ATCC 4352 |                 |
|-----------------|---------------------|-----------------|-------------------------|-----------------|
|                 | % Reduction         | Log10 Reduction | % Reduction             | Log10 Reduction |
| Current loading | 99.9998%            | 5.69            | > 99.995 %              | > 4.29          |

**Passing Criteria:**

| Method                 | Folia Antimicrobial Level | Minimum Pass Level? | Passing? |
|------------------------|---------------------------|---------------------|----------|
| AATCC <sup>1</sup>     | >4 log                    | User-specified      | Pass     |
| ISO 20743 <sup>2</sup> | >4 log                    | 2 log               | Pass     |
| EPA <sup>3</sup>       | >4 log                    | 3 log               | Pass     |

Notes:

1. AATCC does not specify performance criteria, therefore it may be established by the Study Sponsor.
2. ISO 20743 recommends a 2-Log<sub>10</sub> or 99% reduction.
3. The United States Environmental Protection Agency (US EPA) often recommends a 3-Log<sub>10</sub> or 99.9% reduction.



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**STUDY TITLE**

Non-GLP Antibacterial Activity and Efficacy of Folia Materials Fabrics Using the AATCC 100 Method

**Product Identity**

Sample A  
Sample B  
Sample C  
Sample D

**Test Microorganism(s)**

*Staphylococcus aureus* ATCC 6538  
*Klebsiella pneumoniae* ATCC 4532

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**Study Sponsor**

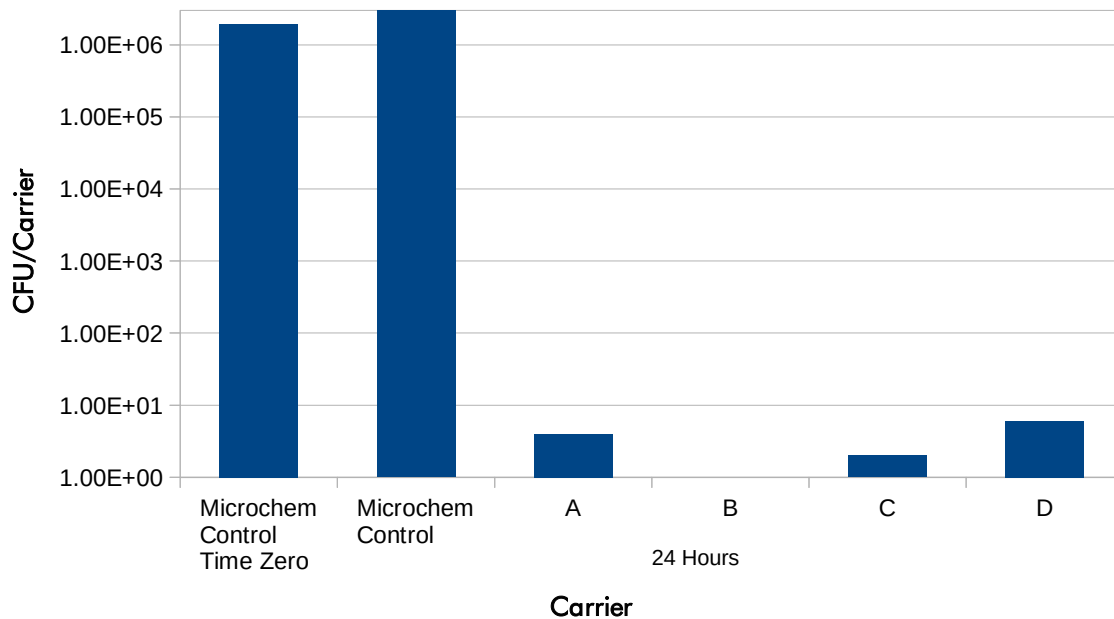
Folia Materials, Inc.



## RESULTS

**Table 1: *S. aureus* ATCC 6538 Percent Reduction and Log<sub>10</sub> Reduction Compared to Time Zero Concentration**

| Test Microorganism  | Contact Time | Carrier Type      | CFU/Carrier | Percent Reduction Compared to Time Zero Control | Log <sub>10</sub> Reduction Compared to Time Zero Control |
|---|--------------|-------------------|-------------|---|---|
| <i>S. aureus</i><br>ATCC 6538   | Time Zero    | Microchem Control | 1.95E+06    | N/A   | N/A   |
|   | 24 Hours     | Microchem Control | >5.00E+07** | N/A   | N/A   |
|   |              | A                 | 4.00E+00    | 99.9998%  | 5.69  |
|   |              | B                 | <2.00E+00*  | >99.9999%                                       | >5.98   |
|   |              | C                 | 2.00E+00    | 99.9999%  | 5.99  |
|   |              | D                 | 6.00E+00    | 99.9997%  | 5.51  |
| *Limit of detection. Values fell below the limit of detection <2.00E+00<br>** Maximum detection value. Values were >5.00E+07. |              |                   |             |   |   |



**Figure 1: *S. aureus* ATCC 6538 Average CFU per Carrier**



RESULTS (cont.)

Table 2: *K. pneumoniae* ATCC 4352 Percent Reduction and Log<sub>10</sub> Reduction Compared to Time Zero Concentration

| Test Microorganism  | Contact Time | Carrier Type                | CFU/Carrier | Percent Reduction Compared to Time Zero Control | Log <sub>10</sub> Reduction Compared to Time Zero Control |
|---|--------------|-----------------------------|-------------|---|---|
| <i>K. pneumoniae</i><br>ATCC 4352                                       | Time Zero    | Microchem Control Time Zero | 1.95E+05    | N/A   | N/A   |
|   | 24 Hours     | Microchem Control           | 1.43E+07    | N/A   | N/A   |
|   |              | A                           | <1.00E+01*  | >99.995%  | >4.29   |
|   |              | B                           | <1.00E+01*  | >99.995%  | >4.29   |
|   |              | C                           | <1.00E+01*  | >99.995%  | >4.29   |
|   |              | D                           | <1.00E+01*  | >99.995%  | >4.29   |
| *Limit of detection. Values fell below the limit of detection <1.00E+01 |              |                             |             |   |   |

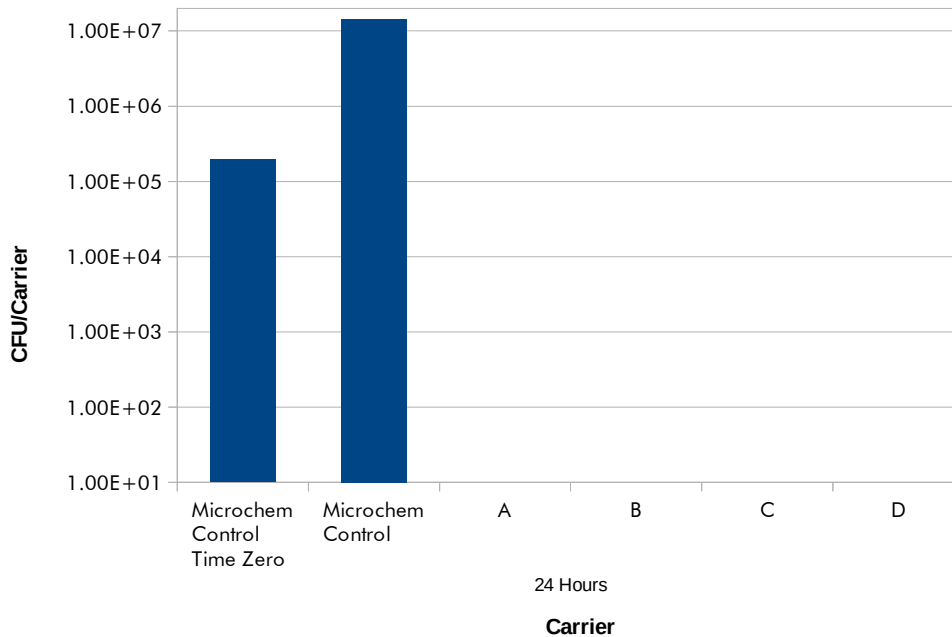


Figure 2: *K. pneumoniae* ATCC 4352 Average CFU per Carrier