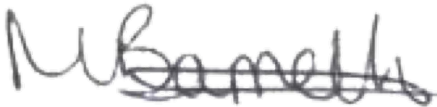


## Textiles — Determination of antibacterial activity of textile products (ISO 20743:2013)

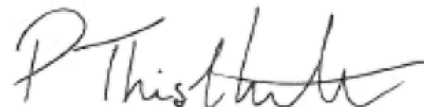
Microbiological Solutions Limited (MSL)  
Gollinrod, Walmersley, Bury, BL9 5NB, UK

Angela Davies, CEO

Customer: Chieftain Fabrics  
Contact name: Sinéad Doyle  
Email: [sinead.doyle@chieftainfabrics.com](mailto:sinead.doyle@chieftainfabrics.com)  
Address: Trim Meath C15 W248 Ireland  
PO/Quote number: Q004333  
Report Date: 06/04/2021  
Issue Number: 1



Megan Barrett  
Laboratory Manager



Peter Thistlethwaite  
Technical Projects Manager

| Test information                         |                                                                                  | Deviation |
|------------------------------------------|----------------------------------------------------------------------------------|-----------|
| Name of Product                          | Carousel                                                                         | /         |
| Batch Number & Expiry Date               | N/S                                                                              |           |
| Date of Delivery                         | 26/02/2021                                                                       |           |
| Period of Analysis                       | 18/03/2021                                                                       |           |
| Manufacturer / Supplier                  | Chieftain Fabrics                                                                |           |
| Storage Conditions                       | Ambient                                                                          |           |
| Appearance of the Product                | Green fabric                                                                     |           |
| Neutralisation Method                    | Dilution                                                                         |           |
| Test Concentrations                      | <b>As supplied</b>                                                               |           |
| Method used                              | <b>Absorption</b>                                                                |           |
| Temperature of Incubation                | 37°C ±1°C                                                                        |           |
| Identification of the bacterial Strains: | <i>Staphylococcus aureus</i> ATCC 6538<br><i>Klebsiella pneumoniae</i> ATCC 4352 |           |
| Contact Times                            | 24 Hours                                                                         |           |

**Test Result Summary**

The test product received has shown the following log reductions when tested under the conditions stipulated in this report:  
**Staphylococcus aureus - 4.20log (99.99%)**  
**Klebsiella pneumoniae - 3.77log (99.98%)**

The test results on this report refer only to the items tested as supplied by the customer. This report shall not be reproduced except in full and with written approval of Microbiological Solutions Ltd. All reports are archived for a minimum of 2 years.

The sample will be retained for 1 month unless otherwise requested in writing.

**Scope**

This International Standard specifies quantitative test methods to determine the antibacterial activity of all antibacterial textile products including nonwovens.

This International Standard is applicable to all textile products, including cloth, wadding, thread and material for clothing, bedclothes, home furnishings and miscellaneous goods, regardless of the type of antibacterial agent used (organic, inorganic, natural or man-made) or the method of application (built-in, after-treatment or grafting).

Based on the intended application and on the environment in which the textile product is to be used and also on the surface properties of the textile properties, the user can select the most suitable of the following three inoculation methods on determination of antibacterial activity:

- a) Absorption method (an evaluation method in which the test bacterial suspension is inoculated directly onto specimens);
- b) Transfer method (an evaluation method in which test bacteria are placed on an agar plate and transferred onto specimens);
- c) Printing method (an evaluation method in which test bacteria are placed on a filter and printed onto specimens).

The colony plate count method and the ATP (ATP = Adenosine Tri-phosphate) luminescence method are also specified for measuring the enumeration of bacteria.

**Acceptance Criteria**

The acceptance criteria for efficacy of antibacterial property (A) in the standard is given as  $2 < A < 3$  is a significant level of efficacy,  $A > 3$  is a strong level of efficacy.

**Test Results**

**Staphylococcus aureus**

|    | R1       |         |         |              | R2       |         |         |              | R3       |         |         |              | Average log recovery |
|----|----------|---------|---------|--------------|----------|---------|---------|--------------|----------|---------|---------|--------------|----------------------|
|    | Dilution | Count 1 | Count 2 | Log recovery | Dilution | Count 1 | Count 2 | Log recovery | Dilution | Count 1 | Count 2 | Log recovery |                      |
| Co | 1        | 101     | 120     | 4.34         | 1        | 96      | 98      | 4.59         | 2        | 31      | 21      | 4.72         | 4.55                 |
| Ct | 1        | 79      | 110     | 4.28         | 1        | 57      | 60      | 4.37         | 1        | 34      | 29      | 3.80         | 4.15                 |
| TO | 1        | 220     | 190     | 4.61         | 1        | 140     | 146     | 4.76         | 1        | 124     | 141     | 4.42         | 4.60                 |
| Tt | 0        | 0       | 0       | 0.00         | 0        | 0       | 0       | 0.00         | 0        | 0       | 0       | 0.00         | 0.00                 |

| A VALUE       |                      |
|---------------|----------------------|
| Log reduction | Percentage reduction |
| 4.20          | 99.99%               |

**Klebsiella pneumoniae**

|    | R1       |         |         |              | R2       |         |         |              | R3       |         |         |              | Average log recovery |
|----|----------|---------|---------|--------------|----------|---------|---------|--------------|----------|---------|---------|--------------|----------------------|
|    | Dilution | Count 1 | Count 2 | Log recovery | Dilution | Count 1 | Count 2 | Log recovery | Dilution | Count 1 | Count 2 | Log recovery |                      |
| Co | 1        | 70      | 67      | 4.14         | 1        | 64      | 62      | 4.40         | 1        | 69      | 65      | 4.13         | 4.22                 |
| Ct | 0        | 118     | 118     | 3.37         | 0        | 116     | 118     | 3.37         | 0        | 112     | 113     | 3.35         | 3.36                 |
| TO | 2        | 29      | 30      | 4.77         | 1        | 126     | 130     | 4.71         | 1        | 130     | 119     | 4.40         | 4.63                 |
| Tt | 0        | 0       | 0       | 0.00         | 0        | 0       | 0       | 0.00         | 0        | 0       | 0       | 0.00         | 0.00                 |

| A VALUE       |                      |
|---------------|----------------------|
| Log reduction | Percentage reduction |
| 3.77          | 99.98%               |

**Key**

C0 – Log10 cfu/cm2 recovered from control at time point 0h

Ct – Log10 cfu/cm2 recovered from control at time point t

T0– Log10 cfu/cm2 recovered from test sample at time point 0h

Tt– Log10 cfu/cm2 recovered from test sample at time point t

A – Antibacterial activity value (Ct-Tt)