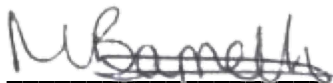


# ISO 18184:2019 Textiles- Determination of antiviral activity of textile products

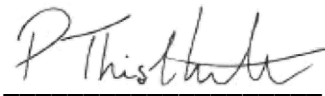
Microbiological Solutions Limited (MSL)  
Gollinrod, Walmersley, Bury, BL9 5NB, UK

Angela Davies, CEO

Customer: Sereneview  
Contact name: Loren Price  
Email: [loren@sereneview.com](mailto:loren@sereneview.com)  
Address: 859 Pinehurst Dr.  
Lake Elsinore,  
CA 92530  
USA  
PO/Quote number: Q003223  
Report Date: 11/11/2020  
Issue Number: 1



Megan Barrett  
Laboratory Manager



Peter Thistlethwaite  
Technical Projects Manager

| Test information                     |                                    | Deviation |
|--------------------------------------|------------------------------------|-----------|
| Name of Product                      | AEGIS                              | /         |
| Batch Number & Expiry Date           | N/S                                |           |
| Date of Delivery                     | 29/07/2020                         |           |
| Period of Analysis                   | 04/11/2020-11/11/2020              |           |
| Manufacturer / Supplier              | Sereneview                         |           |
| Storage Conditions                   | Ambient                            |           |
| Appearance of the Product            | Brown and white fabric             |           |
| Neutralisation Method                | Dilution                           |           |
| Test Concentrations                  | As supplied                        |           |
| Test Temperature                     | 25°C ± 1°C                         |           |
| Temperature of Incubation            | 37°C ± 1°C                         |           |
| Identification of the Viral Strains: | Feline corona virus, Strain Munich |           |
| Contact Times                        | 15 Mins and 60 Mins ± 10s          |           |

**Test Result Summary**

**The test fabric showed the following log reductions when tested against Feline coronavirus:**  
**15 minutes – 0.40log (60.44%)**  
**60 minutes – 1.68log (97.91%)**

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

|         | Feline coronavirus | COVID-19 (SARS—CoV2) |
|---------|--------------------|----------------------|
| Realm   | Riboviria          | Riboviria            |
| Order   | Nidovirales        | Nidovirales          |
| Family  | Coronaviridae      | Coronaviridae        |
| Genus   | Alphacoronavirus   | Betacoronavirus      |
| Species | Alphacoronavirus 1 | COVID-19             |

The members of the family Coronaviridae are enveloped and have a positive sense RNA genome. Coronaviruses have a distinct morphology with an outer ‘corona’ of embedded envelope spikes. These viruses cause a broad spectrum of animal and human disease.

Andrew M.Q. King, Michael J. Adams, Eric B. Carstens, and Elliot J. Lefkowitz ‘Virus Taxonomy, Classification and Nomenclature of Viruses, Ninth Report of the International Committee on Taxonomy of Viruses’ 2012 ISBN 9780123846846

**Scope**

This standard outlines the test method for the determination of the antiviral activity of the textile products against specified viruses.

**Method**

A 20mmx20mm sample of test material is cut (overall mass should be 0.40g and can be made up with extra material if required). 9 control pieces are required and 6 test pieces.

3 pieces of each material are used to test the effect of the fabric on cells without virus (cytotoxicity), 3 control pieces are used to recover the starting titre of virus. The remaining pieces are inoculated with 200µl of virus at a concentration of  $\sim 10^7$  TCID<sub>50</sub> (giving a final concentration of  $10^5$ ) and left for the contact time.

Following the contact time, the fabric is recovered in 20ml of cell culture media and enumerated onto an appropriate cell line. TCID<sub>50</sub> is calculated following the appropriate incubation time. Antiviral activity is calculated by comparison of the antiviral test material to the immediate recover from the control fabric.

**Test Results**

| 0 hours   |              |         |
|-----------|--------------|---------|
| Sample    | Log recovery | Average |
| Control 1 | 5.38         | 5.31    |
| Control 2 | 5.38         |         |
| Control 3 | 5.17         |         |

| Controls             |      |       |
|----------------------|------|-------|
| Initial inoculum     | 7.13 | Valid |
| Cytotoxicity Control | 4.13 | Valid |
| Cytotoxicity Test 1  | 3.79 | Valid |

| Contact time:15 minutes |              |         |           |            |
|-------------------------|--------------|---------|-----------|------------|
| Sample                  | Log recovery | Average | Reduction | Percentage |
| Control 1               | 5.33         | 5.01    | 0.29      | 48.91%     |
| Control 2               | 5.13         |         |           |            |
| Control 3               | 4.58         |         |           |            |
| Test 1                  | 4.71         | 4.90    | 0.40      | 60.44%     |
| Test 2                  | 5.08         |         |           |            |
| Test 3                  | 4.92         |         |           |            |

| Contact time:1 hour |              |         |           |            |
|---------------------|--------------|---------|-----------|------------|
| Sample              | Log recovery | Average | Reduction | Percentage |
| Control 1           | 4.71         | 4.76    | 0.54      | 71.27%     |
| Control 2           | 5.04         |         |           |            |
| Control 3           | 4.54         |         |           |            |
| Test 1              | 3.63         | 3.63    | 1.68      | 97.91%     |
| Test 2              | 3.63         |         |           |            |
| Test 3              | 3.63         |         |           |            |

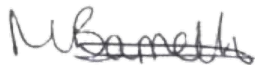
\*Control fabric must not show >1 log reduction

# ISO 18184:2019 Textiles- Determination of antiviral activity of textile products

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

Angela Davies, CEO

Customer: Sereneview  
Contact name: Loren Price  
Email: loren@sereneview.com  
Address: 859 Pinehurst Dr.  
Lake Elsinore,  
CA 92530  
USA  
PO/Quote number: Q002426/1  
Report Date: 30/05/20  
Issue Number: 1



Megan Barrett  
Laboratory Manager



Peter Thistlethwaite  
Technical Projects Manager

| Test information                     |   | Deviation |
|--------------------------------------|---|-----------|
| Name of Product                      | AEGIS                                   | /         |
| Batch Number & Expiry Date           | N/S                                     |           |
| Date of Delivery                     | 06-Apr-2020                             |           |
| Period of Analysis                   | 08/05/2020-15/05/2020                   |           |
| Manufacturer / Supplier              | Sereneview                              |           |
| Storage Conditions                   | Ambient                                 |           |
| Appearance of the Product            | Blue material                           |           |
| Neutralisation Method                | Dilution                                |           |
| Test Concentrations                  | <b>As supplied</b>                      |           |
| Test Temperature                     | 20°C ± 1°C                              |           |
| Temperature of Incubation            | Bacteria - 37°C ± 1°C for 24hr to 48hrs |           |
| Identification of the Viral Strains: | Feline coronavirus, Strain Munich       |           |
| Contact Times                        | 1 hours                                 |           |

**Deviations**

The product was placed under a UV light for the duration of the contact time.  
 The control cotton was tested without UV light.

**Test Result Summary**

**The test product received has shown a log reduction of 3.33 (99.95%) when tested under the conditions stipulated in this report.**

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

**Scope**

This standard outlines the test method for the determination of the antiviral activity of the textile products against specified viruses.

**Method**

A 20mmx20mm sample of test material is cut (overall mass should be 0.40g and can be made up with extra material if required). 9 control pieces are required and 6 test pieces.

3 pieces of each material are used to test the effect of the fabric on cells without virus (cytotoxicity), 3 control pieces are used to recover the starting titre of virus. The remaining pieces are inoculated with 200µl of virus at a concentration of  $\sim 10^7$  TCID<sub>50</sub> (giving a final concentration of  $10^5$ ) and left for the contact time.

Following the contact time, the fabric is recovered in 20ml of cell culture media and enumerated onto an appropriate cell line. TCID<sub>50</sub> is calculated following the appropriate incubation time. Antiviral activity is calculated by comparison of the antiviral test material to the immediate recover from the control fabric.

**Test Results**

| 0 hours   |              |         |
|-----------|--------------|---------|
| Sample    | Log recovery | Average |
| Control 1 | 5.66         | 5.58    |
| Control 2 | 5.71         |         |
| Control 3 | 5.38         |         |

| Controls             |      |       |
|----------------------|------|-------|
| Initial inoculum     | 7.79 | Valid |
| Cytotoxicity Test    | 4.17 | Valid |
| Cytotoxicity Control | 4.08 | Valid |

| Contact time:1 hour |              |         |           |            |
|---------------------|--------------|---------|-----------|------------|
| Sample              | Log recovery | Average | Reduction | Percentage |
| Control 1           | 5.29         | 4.85    | 0.73      | 81.58%     |
| Control 2           | 5.17         |         |           |            |
| Control 3           | 4.08         |         |           |            |
| Test 1              | 2.25         | 2.25    | 3.33      | 99.95%     |
| Test 2              | 2.25         |         |           |            |
| Test 3              | 2.25         |         |           |            |