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

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Customer:
Contact name:
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PO/Quote number:
Report Date: 05/11/2020
Issue Number: 1

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| Test information | | Deviation |
|---|---|---|
| **Name of Product** | Test 1 - Strong S Unwashed<br>Test 2 - Strong S Washed<br>Test 3 - Tweet I Unwashed<br>Test 4 - Tweet I Washed | |
| **Batch Number & Expiry Date** | N/S | |
| **Date of Delivery** | 09/09/2020 | |
| **Period of Analysis** | 20/10/2020-28/10/2020 | |
| **Manufacturer / Supplier** | | |
| **Storage Conditions** | Ambient | |
| **Appearance of the Product** | Beige fabrics | |
| **Neutralisation Method** | Dilution | |
| **Test Concentrations** | As supplied | |
| **Test Temperature** | $25^0$C $\pm$ 1°C | |
| **Temperature of Incubation** | 37°C ±1°C | |
| **Identification of the Viral Strains:** | Feline corona virus, Strain Munich | |
| **Contact Times** | 2 hour $\pm$ 10s | |

**Test Result Summary**

**The test fabric showed the following log reductions when tested against Feline coronavirus with a 2 hour contact time:**
**Test 1 – 1.10log (99.62%)**
**Test 2 – 0.99log (99.08%)**
**Test 3 – 1.41log (99.10%)**
**Test 4 – 1.08log (98.95%)**

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.

| | **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 ate inoculated with 200µl of virus at a concentration of ~$10^7$ $TCID^{50}$ (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. TCID50 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 | 4.96 | |
| Control 2 | 5.13 | |
| Control 3 | 5.21 | 5.10 |

| Controls | | |
|---|---|---|
| Initial inoculum | 7.38 | Valid |
| Cytotoxicity Test 1 | 4.04 | Valid |
| Cytotoxicity Test 2 | 4.17 | Valid |
| Cytotoxicity Test 3 | 4.08 | Valid |
| Cytotoxicity Test 4 | 4.08 | Valid |
| Cytotoxicity Control | 4.21 | Valid |

**Test 1**

| Contact time:2 hour | | | | |
|---|---|---|---|---|
| Sample | Log recovery | Average | Reduction | Percentage |
| Control 1 | 4.38 | | | |
| Control 2 | 4.63 | | | |
| Control 3 | 4.50 | 4.50 | 0.60 | 74.72% |
| Test 1 | 4.17 | | | |
| Test 2 | 4.25 | | | |
| Test 3 | 4.21 | 4.21 | 1.10 | 99.62% |

**Test 2**

| Contact time:2 hour | | | | |
|---|---|---|---|---|
| Sample | Log recovery | Average | Reduction | Percentage |
| Control 1 | 4.38 | | | |
| Control 2 | 4.63 | | | |
| Control 3 | 4.50 | 4.50 | 0.60 | 74.72% |
| Test 1 | 4.54 | | | |
| Test 2 | 4.33 | | | |
| Test 3 | 4.08 | 4.32 | 0.99 | 99.08% |

**Test 3**

| Contact time:2 hour | | | | |
|---|---|---|---|---|
| Sample | Log recovery | Average | Reduction | Percentage |
| Control 1 | 4.38 | | | |
| Control 2 | 4.63 | | | |
| Control 3 | 4.50 | 4.50 | 0.60 | 74.72% |
| Test 1 | 4.04 | | | |
| Test 2 | 4.21 | | | |
| Test 3 | 3.96 | 4.07 | 1.41 | 99.10% |

**Test 4**

| Contact time:2 hour | | | | |
|---|---|---|---|---|
| Sample | Log recovery | Average | Reduction | Percentage |
| Control 1 | 4.38 | | | |
| Control 2 | 4.63 | | | |
| Control 3 | 4.50 | 4.50 | 0.60 | 74.72% |
| Test 1 | 4.25 | | | |
| Test 2 | 4.21 | | | |
| Test 3 | 4.29 | 4.25 | 1.08 | 98.95% |

***Control fabric must not show >1 log reduction**

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