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

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PO/Quote number: Q002068
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Issue Number: 1

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Test information		Deviation
Name of Product	093 Satin filament 009 Untreated control	
Batch Number & Expiry Date	N/S	
Date of Delivery	05/02/2020	
Period of Analysis	19/02/2020-24/02/2020	
Manufacturer / Supplier	Panaz Ltd	
Storage Conditions	Ambient	
Appearance of the Product	White cotton	
Neutralisation Method	Dilution	
Product Diluent	N/A	
Test Concentrations	Neat as supplied	
Test Temperature	25^0C ± 1°C	
Temperature of Incubation	37°C ±1°C	
Identification of the Viral Strains:	Feline corona virus, Strain Munich	
Contact Times	1 hour ± 10s	

Test Result Summary

The test fabric showed an overall log reduction of 1.14 (92.80%) when tested against Feline coronavirus with a 1-hour contact time.

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	5.79	
Control 2	5.83	
Control 3	5.79	5.80

Controls		
Initial inoculum	7.42	Valid
Cytotoxicity Test	4.50	Valid
Cytotoxicity Control	4.63	Valid

Contact time:1 hour				
Sample	Log recovery	Average	Reduction	Percentage
Control 1	5.71			
Control 2	5.54			
Control 3	5.50	5.58	0.22	39.70%
Test 1	4.63			
Test 2	4.79			
Test 3	4.58	4.67	1.14	92.80%

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

Raw Data

0 hours recovery (Control)

Control product		Product concentration			Neat	Contact time		0 hour
Dilution	Counts						% CPE	p(1-p)
-2	4	4	4	4	4	4	1	0
-3	4	4	4	4	4	4	1	0
-4	4	4	4	4	4	4	1	0
-5	4	3	3	3	4	4	0.875	0.109375
-6	2	2	2	0	1	1	0.333333	0.222222
-7	0	0	1	1	0	0	0.083333	0.076389
-8	0	0	0	0	0	0	0	0
-9	0	0	0	0	0	0	0	0

Control product		Product concentration			Neat	Contact time		0 hour
Dilution	Counts						% CPE	p(1-p)
-2	4	4	4	4	4	4	1	0
-3	4	4	4	4	4	4	1	0
-4	4	4	4	4	4	4	1	0
-5	4	4	4	4	3	3	0.916667	0.076389
-6	1	1	1	2	2	1	0.333333	0.222222
-7	1	0	0	0	0	0	0.041667	0.039931
-8	0	0	0	0	0	0	0	0
-9	0	0	0	0	0	0	0	0

Control product		Product concentration			Neat	Contact time		0 hour
Dilution	Counts						% CPE	p(1-p)
-2	4	4	4	4	4	4	1	0
-3	4	4	4	4	4	4	1	0
-4	4	4	4	4	4	4	1	0
-5	4	4	4	4	4	4	1	0
-6	2	2	1	1	1	1	0.333333	0.222222
-7	0	0	0	0	0	0	0	0
-8	0	0	0	0	0	0	0	0
-9	0	0	0	0	0	0	0	0

Raw data
1 hour (Control)

Control product		Product concentration			Neat	Contact time		1 hour
Dilution	Counts						% CPE	p(1-p)
-2	4	4	4	4	4	4	1	0
-3	4	4	4	4	4	4	1	0
-4	4	4	4	4	4	4	1	0
-5	4	3	3	3	4	4	0.875	0.109375
-6	2	2	0	0	1	1	0.25	0.1875
-7	0	0	1	1	0	0	0.083333	0.076389
-8	0	0	0	0	0	0	0	0
-9	0	0	0	0	0	0	0	0

Control product		Product concentration			Neat	Contact time		1 hour
Dilution	Counts						% CPE	p(1-p)
-2	4	4	4	4	4	4	1	0
-3	4	4	4	4	4	4	1	0
-4	4	4	4	4	3	4	0.958333	0.039931
-5	3	3	4	4	4	3	0.875	0.109375
-6	2	2	0	1	0	0	0.208333	0.164931
-7	0	0	0	0	0	0	0	0
-8	0	0	0	0	0	0	0	0
-9	0	0	0	0	0	0	0	0

Control product		Product concentration			Neat	Contact time		1 hour
Dilution	Counts						% CPE	p(1-p)
-2	4	4	4	4	4	4	1	0
-3	4	4	4	4	4	4	1	0
-4	4	4	4	4	4	4	1	0
-5	2	2	2	3	3	4	0.666667	0.222222
-6	1	1	2	2	2	0	0.333333	0.222222
-7	0	0	0	0	0	0	0	0
-8	0	0	0	0	0	0	0	0
-9	0	0	0	0	0	0	0	0

Raw data
1 hour (Test)

Test product		Product concentration			Neat	Contact time		1 hour
Dilution	Counts						% CPE	p(1-p)
-2	4	4	4	4	4	4	1	0
-3	4	4	4	4	4	4	1	0
-4	4	4	4	4	4	4	1	0
-5	1	1	0	0	0	1	0.125	0.109375
-6	0	0	0	0	0	0	0	0
-7	0	0	0	0	0	0	0	0
-8	0	0	0	0	0	0	0	0
-9	0	0	0	0	0	0	0	0

Test product		Product concentration			Neat	Contact time		1 hour
Dilution	Counts						% CPE	p(1-p)
-2	4	4	4	4	4	4	1	0
-3	4	4	4	4	4	4	1	0
-4	4	4	4	4	4	4	1	0
-5	1	1	2	0	2	0	0.25	0.1875
-6	0	0	0	1	0	0	0.041667	0.039931
-7	0	0	0	0	0	0	0	0
-8	0	0	0	0	0	0	0	0
-9	0	0	0	0	0	0	0	0

Test product		Product concentration			Neat	Contact time		1 hour
Dilution	Counts						% CPE	p(1-p)
-2	4	4	4	4	4	4	1	0
-3	4	4	4	4	4	4	1	0
-4	4	4	3	3	4	4	0.916667	0.076389
-5	1	1	1	1	0	0	0.166667	0.138889
-6	0	0	0	0	0	0	0	0
-7	0	0	0	0	0	0	0	0
-8	0	0	0	0	0	0	0	0
-9	0	0	0	0	0	0	0	0

Raw data controls

Cytotoxicity (product)				Product concentration			Neat	
Dilution	Counts						% CPE	p(1-p)
-2	4	4	4	4	4	4	1	0
-3	4	4	4	4	4	4	1	0
-4	3	3	3	2	3	3	0.708333	0.206597
-5	2	2	1	1	0	0	0.25	0.1875
-6	1	0	0	0	0	0	0.041667	0.039931
-7	0	0	0	0	0	0	0	0
-8	0	0	0	0	0	0	0	0
-9	0	0	0	0	0	0	0	0

Cytotoxicity (control)				Product concentration			Neat	
Dilution	Counts						% CPE	p(1-p)
-2	4	4	4	4	4	4	1	0
-3	4	4	4	4	4	4	1	0
-4	4	3	3	3	2	4	0.791667	0.164931
-5	2	2	1	1	0	1	0.291667	0.206597
-6	1	0	0	0	0	0	0.041667	0.039931
-7	0	0	0	0	0	0	0	0
-8	0	0	0	0	0	0	0	0
-9	0	0	0	0	0	0	0	0

Virus Initial				Contact time		N/A		
Dilution	Counts						% CPE	p(1-p)
-2	4	4	4	4	4	4	1	0
-3	4	4	4	4	4	4	1	0
-4	4	4	4	4	4	4	1	0
-5	4	4	4	4	4	4	1	0
-6	4	4	4	4	4	4	1	0
-7	3	3	3	2	2	1	0.583333	0.243056
-8	1	1	1	1	2	0	0.25	0.1875
-9	1	1	0	0	0	0	0.083333	0.076389