PERFECTUS BIOMED
Microbiological service provider

VIRUCIDAL EFFICACY TESTING FOR A BIOCIDE USING CUSTOMISED METHODS

Date issued: 17th November 2020

Ben Hayson
HydroSilex Europe AB
Sattarevagen 8 434 37
Kungsbacka Sverige
Sweden

Dear Ben,

Please find the report with respect to Nordic Chem 001. Please feel free to contact us to discuss these findings further.

The test results in this report relate only to the test item(s) tested.

This test report may not be reproduced expect in full, adapted, altered or used to create derivative work, without written approval from Perfectus Biomed Limited.

Yours sincerely,

Nick Hunt

Laboratory Manager

PERFECTUS BIOMED LTD
Techspace One, Sci-Tech Daresbury, Keckwick Lane, Cheshire, WA4 4AB
Tel 01925 737 237 **Mobile** 07841342904
Email sam@perfectusbiomed.com **www.perfectusbiomed.com**
Company registration number 8323267

bsi. UKAS MANAGEMENT SYSTEMS 003

Test laboratory address: Perfectus Biomed Limited
Techspace One, Sci-Tech Daresbury, Keckwick Lane, WA4 4AB

1.0 Aim of the study

To determine the anti-viral efficacy of a pre-coated surface over 90 days (0 days and 30 days only reported in this document).

2.0 Product

Details of the test item analysed during this study are listed in Table 1.

Item	Details
Name of the product tested	Nordic Chem Antimicrobial
Batch number tested	Not provided
Expiry date (if available)	Not provided
Manufacturer/supplier	Nordic Chem
Date of delivery	21st Aug 2020
Condition upon receipt	Undamaged
Storage conditions	Room temperature
Product diluent	Ready to use
Active substance(s)	Not provided
Active substance(s) concentration(s)	Not provided
Appearance of the product	Clear Liquid with white precipitate

Table 1. Test item details.

PERFECTUS BIOMED LTD
Techspace One, Sci-Tech Daresbury, Keckwick Lane, Cheshire, WA4 4AB
Tel 01925 737 237 **Mobile** 07841342904
Email sam@perfectusbiomed.com **www.perfectusbiomed.com**
Company registration number 8323267

PERFECTUS BIOMED
Microbiological service provider

3.0 Methodology

3.1 Cytotoxicity Screen of a Pre-Coated Surface

Experimental conditions:

Cell line name: MRC-5

Cell line source: ATCC®

Cell culture medium: Eagle's Minimum Essential Medium (EMEM)

Dilutions of disinfectant tested: Ready to Use

Incubation conditions: 35 °C ± 2 °C and 5% CO_2

Incubation time: 24 hours ± 1 hour

Interfering substance: Not Applicable

Score criteria:

Visual Score	Cells with cytotoxic effects (%)	Reactivity classification
0	0	None
1	0 – 20	Slight
2	20 – 50	Mild
3	50 – 70	Moderate
4	70 – 100	Severe

Table 2. Cytotoxicity visual scoring and reactivity classifications.

Deviations/ modifications: Not Applicable

Justification: Not Applicable

PERFECTUS BIOMED LTD
Techspace One, Sci-Tech Daresbury, Keckwick Lane, Cheshire, WA4 4AB
Tel 01925 737 237 **Mobile** 07841342904
Email sam@perfectusbiomed.com **www.perfectusbiomed.com**
Company registration number 8323267

PERFECTUS BIOMED
Microbiological service provider

3.2 Assessment of a Pre-Coated Surface against Human Coronavirus 229E using a modified method from BS ISO 21702:2019: Measurement of Anti-Viral Activity on Plastics and Other Non-Porous Surfaces.

Experimental conditions:

Period of analysis:	19th October 2020 to 6th November 2020
Viral strain:	Human Coronavirus 229E (ATCC® VR-740™)
Cell line:	MRC-5
Cell culture medium:	Eagle's Minimum Essential Medium (EMEM)
Product test concentrations:	Ready to use
Diluent used for test item:	Not applicable
Appearance of product dilutions:	Not applicable
Contact time(s):	5 minutes and 120 minutes
Test temperature(s):	Room temperature
Incubation conditions:	35 °C ± 2 °C and 5% CO_2
Interfering substance:	Not applicable
Stability/appearance during testing:	Stable – No precipitates
Method of activity suppression:	Addition of ice-cold medium / filtration technique
Method of filtration:	Ultrafiltration with MicroSpin™ S 400 HR columns
Deviations/modifications:	Glass slides were coated with 47 µL of the test reagent and were allowed to dry for 0 and 30 days. Uncoated slides were used as a control. The coated and uncoated slides were inoculated with Human Coronavirus 229E and covered with a 1cm x 1cm film for 5 minutes and 2 hours. After the contact time, the slides were rinsed with 900 µL of medium and vortexed for 15 seconds. A $TCID_{50}$ was then performed and the cytopathic effect was recorded to assess the virucidal activity.

PERFECTUS BIOMED LTD
Techspace One, Sci-Tech Daresbury, Keckwick Lane, Cheshire, WA4 4AB
Tel 01925 737 237 **Mobile** 07841342904
Email sam@perfectusbiomed.com **www.perfectusbiomed.com**
Company registration number 8323267

Justification: The deviations were to support the duration of residual activity of pre-coated surfaces.

4.0 Results

4.1 Cytotoxicity screen of a Pre-Coated Surface

Results of the cytotoxicity screen are outlined in Table 3.

Treatment	Visual score	Reactivity classification
Negative control	0	No cytotoxicity
Nordic Chem Antimicrobial 10^{-1}	0	No cytotoxicity

Table 3. Cytotoxicity of Nordic Chem Antimicrobial using visual scoring.

Comments/observations: None.

4.2 Assessment of a Pre-Coated Surface against Human Coronavirus 229E using a modified method from BS ISO 21702:2019: Measurement of Anti-Viral Activity on Plastics and Other Non-Porous Surfaces.

A summary of the test results is outlined in Table 4-5.

4.2.1 0 day treatment

Test item	Log recovery ($Log_{10}TCID_{50}mL^{-1}$)			Log reduction ($Log_{10}TCID_{50}mL^{-1}$)		Percentage Reduction	
	0 minutes	5 minutes	120 minutes	5 minutes	120 minutes	5 minutes	120 minutes
Negative control	4.90	4.90	4.60	N/A	N/A	N/A	N/A
Coated	N/A	4.80	2.70	0.10	2.10	23%	99%

Table 4. $Log_{10}TCID_{50}$ recovery and reduction results for Human Coronavirus 229E following treatment with Nordic Chem Antimicrobial pre-coated surface at 0 days for 5 and 120 minutes according to the modified BS ISO 21702:2019. N/A = Not applicable.

PERFECTUS BIOMED LTD
Techspace One, Sci-Tech Daresbury, Keckwick Lane, Cheshire, WA4 4AB
Tel 01925 737 237 **Mobile** 07841342904
Email sam@perfectusbiomed.com **www.perfectusbiomed.com**
Company registration number 8323267

PERFECTUS BIOMED
Microbiological service provider

4.2.2 30 day treatment

Test item	Log recovery ($Log_{10}TCID_{50}mL^{-1}$)			Log reduction ($Log_{10}TCID_{50}mL^{-1}$)		Percentage reduction	
	0 minutes	5 minutes	120 minutes	5 minutes	120 minutes	5 minutes	120 minutes
Negative control	4.90	4.90	4.60	N/A	N/A	N/A	N/A
Coated	N/A	4.90	2.70	NR	1.90	NR	99%

Table 5. $Log_{10}TCID_{50}$ recovery and reduction results for Human Coronavirus 229E following treatment with Nordic Chem Antimicrobial pre-coated surface at 30 days for 5 and 120 minutes according to the modified BS ISO 21702:2019. N/A = Not applicable, NR = No reduction.

Conclusion:

According to the modified BS ISO 21702:2019, Nordic Chem Antimicrobial demonstrated a 99% reduction in virucidal activity against Human Coronavirus 229E, when tested for 5 minutes and 120 minutes at room temperature, 30 days after the application of the coating.

Report prepared by:

Signed:

Name: Anna Holt
Position: Scientist I
Date: 12th November 2020

Report approved by:

Signed:

Name: Hannah Thomas
Position: Operations Manager
Date: 13th November 2020

PERFECTUS BIOMED LTD
Techspace One, Sci-Tech Daresbury, Keckwick Lane, Cheshire, WA4 4AB
Tel 01925 737 237 **Mobile** 07841342904
Email sam@perfectusbiomed.com **www.perfectusbiomed.com**
Company registration number 8323267

PERFECTUS BIOMED
Microbiological service provider

Appendix I

Raw data for Nordic Chem Antimicrobial against Human Coronavirus 229E

Test item	Concentration	Contact time	Replicate	Dilution							
				-2	-3	-4	-5	-6	-7	-8	UI
Nordic Chem Antimicrobial	Coated 0 days	5 minutes	n=1	444	444	000	000	000	000	000	000
				444	444	004	000	000	000	000	000
			n=2	444	444	444	000	000	000	000	000
				444	444	400	000	000	000	000	000
			n=3	444	444	000	000	000	000	000	000
				444	444	004	000	000	000	000	000
		120 minutes	n=1	000	000	000	000	000	000	000	000
				000	000	000	000	000	000	000	000
			n=2	000	000	000	000	000	000	000	000
				000	000	000	000	000	000	000	000
			n=3	000	000	000	000	000	000	000	000
				000	000	000	000	000	000	000	000
Nordic Chem Antimicrobial	Coated 30 days	5 minutes	n=1	444	444	400	000	000	000	000	000
				444	444	440	000	000	000	000	000
			n=2	444	444	400	000	000	000	000	000
				444	444	400	000	000	000	000	000
			n=3	444	444	044	000	000	000	000	000
				444	444	400	000	000	000	000	000
		120 minutes	n=1	444	000	000	000	000	000	000	000
				000	000	000	000	000	000	000	000
			n=2	000	000	000	000	000	000	000	000
				000	000	000	000	000	000	000	000
			n=3	000	000	000	000	000	000	000	000
				000	000	000	000	000	000	000	000
Virus control	N/A	0 minutes	n=1	444	444	034	000	000	000	000	000
				444	444	000	000	000	000	000	000
			n=2	444	444	044	000	000	000	000	000
				444	444	000	000	000	000	000	000
			n=3	444	444	004	000	000	000	000	000
				444	444	440	000	000	000	000	000
		5 minutes	n=1	444	444	040	000	000	000	000	000
				444	444	040	000	000	000	000	000
			n=2	444	444	040	000	000	000	000	000
				444	444	440	000	000	000	000	000
			n=3	444	444	404	000	000	000	000	000
				444	444	040	000	000	000	000	000

PERFECTUS BIOMED LTD
Techspace One, Sci-Tech Daresbury, Keckwick Lane, Cheshire, WA4 4AB
Tel 01925 737 237 **Mobile** 07841342904
Email sam@perfectusbiomed.com **www.perfectusbiomed.com**
Company registration number 8323267

120 minutes	**n=1**	444	444	000	000	000	000	000	000
		444	444	040	000	000	000	000	000
	n=2	444	404	000	000	000	000	000	000
		444	444	004	000	000	000	000	000
	n=3	444	044	000	000	000	000	000	000
		444	444	040	000	000	000	000	000

Table A. Raw data results for Human Coronavirus 229E following treatment with Nordic Chem Antimicrobial pre-coated surface at 0 days and 30 days for 5 and 120 minutes according to the modified BS ISO 21702:2019.

End of report.

PERFECTUS BIOMED LTD
Techspace One, Sci-Tech Daresbury, Keckwick Lane, Cheshire, WA4 4AB
Tel 01925 737 237 **Mobile** 07841342904
Email sam@perfectusbiomed.com **www.perfectusbiomed.com**
Company registration number 8323267