



Re: VirHealth Report Ref: R2202RAD0739FS-01-V3 , Dated 15/02/2022

I confirm this report certifies that tested products from the Poole Waite and Co Ltd Self-Sanitising Ironmongery Range deactivated more than 80% of the Human coronavirus SARS-CoV-2 over a 2 hour period when compared with a stainless steel control surface.

The test was conducted in accordance with the ISO 21702 (2019) standard.

Signed:

A handwritten signature in blue ink, appearing to read "Nicholas Corlett".

Nicholas Corlett

Director, Radical Materials Ltd



TEST REPORT

R2202RAD0739FS-01-V3

RADICAL MATERIALS

15/02/2022



R2202RAD0739FS-01-V3

Determination of antiviral activity of Powdercoated active surface against
Human coronavirus SARS-CoV-2
 with contact times of
 120 minutes at 25 Celsius degrees, 90% of humidity
 according to the standard
 ISO 21702 (2019)

CLIENT	<p>Radical Materials Mr Damian HARVEY Unit 10 Rassau Industrial Estate NP235SD Ebbw Vale, UK</p>
SERVICE PROVIDER	<p>SAS VirHealth Centre d'Innovation Bâtiment Domilyon 321 Avenue Jean Jaurès 69007 Lyon – France</p>
TECHNICAL CONTRIBUTION	<p>Léa Szpiro, Head of Laboratory Quentin Ascenzi, Surface Laboratory Technician</p>

Quality Approval	Technical Approval
<p>Name: Damien Poizat Function: Technical Quality Manager</p> <p>Done at: Lyon Date: 15/02/2022</p> <p>Signature:</p> <div style="text-align: center;">  <p>VirHealth SAS Centre d'Innovation, Bât Domilyon, 321 av. Jean Jaurès 69007 Lyon France Siret 81204535900013</p> </div>	<p>Name: Dr Vincent Moulès Function: General Manager</p> <p>Done at: Lyon Date: 15/02/2022</p> <p>Signature:</p> <div style="text-align: center;">  <p>VirHealth SAS Centre d'Innovation, Bât Domilyon, 321 av. Jean Jaurès 69007 Lyon France Siret 81204535900013</p> </div>

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I. CONCLUSION

Antiviral activities of the Powdercoated surface and control surface were been tested under conditions defined by ISO 21702 (2019) protocol for contact times of 120 minutes at 25 Celsius degrees, 90% of humidity against the Human coronavirus SARS-CoV-2.

Stainless-steel inactive is the control for this test.

- Powdercoated surface, 120 minutes of contact time

Under experimental conditions, (25°C, 120 minutes, 90% RH), the Powdercoated surface surface shows an antiviral activity associated with a logarithmic reduction of 0.7 log₁₀ (80.05%) under the ISO 21702 (2019) protocol.

Product	Contact time	Antiviral activity R (log ₁₀)	Antiviral activity (%)
Powdercoated surface	120 minutes	R = 0.7	80.05

II. CONTRACTUAL DOCUMENTS

The VirHealth company has been asked to carry out tests according to the standard

ISO 21702 (2019)

On behalf of the company **Poole Waite & Co Ltd, 3 Clerkenwell Road, London EC1M 5PE, United Kingdom** acting through **Radical Materials**

The test was carried out on the following combination of surface:

- Active surface: **Powdercoated surface**
- Non-active surface: Stainless-steel

The present prestation is defined by the following documents

Quote N°DEV0739

All changes made between the previous version R2202RAD0739FS-01-V2 and this one R2202RAD0739FS-01-V3 are identified in **light blue** in the document.

List of changes below:

- Front Page: Correction of the report's reference and amend the date
- Whole document: Correction of the report's reference
- Page 5: Add precision about the final client of this test report
- Whole document: Change "Powdercoat" to "Powdercoated surface"
- Whole document: Add precision about "Active" and "Inactive" surface
- Page 6: Correction of Appearance, Size, Thickness

III. DATA ON SAMPLES AND TEST CONDITIONS

1. Samples identification

Surface	Active surface: Powdercoated	Inactive surface: Stainless-steel
Appearance	Black	Grey
Size (cm/cm ²)	5 x 5	5 x 5
Thickness (mm)	1	2
Porous / Non-porous	Non-porous	Non-porous

2. Experimental conditions

Date of testing	20/01/2022
Micro-organisms	Human coronavirus SARS-CoV-2
Inoculum volume	400 µL
Cover film	4cm x 4 cm = 16cm ²
Contact time	120 minutes
Contact temperature	25 ± 1°C
Relative humidity	90 ± 5%
Interfering substance(s)	N.A
Neutralization method	Submerging in 10 mL of SCDLP medium
Quantification method	Endpoint titration on permissive cells
Number of wells / dilution	8
Incubation temperature	37 ± 1°C

IV. RESULTS

1. Results on Human coronavirus SARS-CoV-2

Antiviral activity of Powdercoated surface surface against Human coronavirus SARS-CoV-2 for a contact time of 120 minutes at 25 Celsius degrees, 90% of humidity.

a. Cell susceptibility

Surface	log ₁₀ DICT ₅₀ / mL	
SCDLP medium	6.7	
Powdercoated surface (active)	6.6	
Stainless steel (inactive)	6.5	
Difference less than 1 log ₁₀	<input checked="" type="checkbox"/> yes	<input type="checkbox"/> No

b. Determination of cytotoxicity

The test surface cytotoxicity is determined by reading of cytopathic effect (CPE) on Vero E6 permissive cells and quantified by TCID₅₀ technique.

For viral recuperation on the surface, the surfaces are submerging in 10 mL of SCDLP medium (recuperation buffer). The recuperation buffer cytotoxicity is determined by reading of cytopathic effect (CPE).

Under test conditions, the recuperations buffers from Powdercoated surface and stainless-steel support did not show cytopathic effects on VERO E6 cells for a contact time of 120 minutes at 25 Celsius degrees, 90% of humidity.

c. Inactivation of antiviral activity

Surface	log ₁₀ DICT ₅₀ /mL	
Sn = SCDLP medium	3.9	
St = Powdercoated surface (active)	4.1	
Su = Stainless-steel (inactive)	4.1	
Sn - Su ≤ 0,5	<input checked="" type="checkbox"/> yes	<input type="checkbox"/> No
Sn - St ≤ 0,5	<input checked="" type="checkbox"/> yes	<input type="checkbox"/> No

d. Test

Raw data for antiviral activity of Powdercoated surface and stainless steel products against Human coronavirus SARS-CoV-2 under test conditions (120 minutes at 25 Celsius degrees, 90% of humidity) are presented in appendices.

Results have been determined by visual reading of cytopathic effects (CPE) and quantified by TCID₅₀ technique on VERO E6 cells.

See Table 1 – Results by cytopathic reading

Table 1 – Results by cytopathic reading

Product	Cytotoxicity (log ₁₀ TCID ₅₀)	Specimen	U ₀ (log ₁₀ TCID ₅₀ /cm ²)	U ₁₂₀ (log ₁₀ TCID ₅₀ /cm ²)
Stainless steel (inactive)	0.5	L1	3.9	3.7
		L2	4.2	3.6
		L3	3.9	3.4
		Average	4.0	3.6

Product	Cytotoxicity (log ₁₀ TCID ₅₀)	Specimen	A ₀ (log ₁₀ TCID ₅₀ /cm ²)	A ₁₂₀ (log ₁₀ TCID ₅₀ /cm ²)
Powdercoated surface (active)	0.5	L1	3.7	2.8
		L2	4.1	2.8
		L3	4.2	3.1
		Average	4.0	2.9
		R (log ₁₀ TCID ₅₀)	<i>I</i>	0.7

R is the antiviral activity

*U*₀ is the average of the common logarithm of the number of TCID₅₀ recovered from three untreated test specimens immediately after inoculation

*U*_{*i*} is the average of the common logarithm of the number of TCID₅₀ recovered from three untreated test specimens

*A*₀ is the average of the common logarithm of the number of TCID₅₀ recovered from three treated test specimens immediately after inoculation

*A*_{*i*} is the average of the common logarithm of the number of TCID₅₀ recovered from three treated test specimens

The logarithmic value of the number of TCID₅₀ recovered immediately after inoculation from untreated test specimen (U₀) satisfies the requirement below: (L_{max} – L_{min}) / (L_{mean}) ≤ 0.2.

V. APPENDICES

1. Materials and reagents

a. Cells and viral strains

	Name	Number of passages	Batch number	Quantification
Cell	Vero E6 (ATCC® CRL-1586TM)	19	FLI CCL-RIE 138-6	n.a.
Viral strain	SARS-CoV-2 variant UK B.1.1.7	n.a.	2021UKCoV6117	10 ^{7.2} TCID ₅₀ /mL

b. Preparation of reagents

Preparation	Source product used	Batch number	Expiration date	Final solution	Internal batch number	Expiration date
Medium & Complements	DMEM	0001020226	09/07/2023	n.a.	n.a.	n.a.
	FCS	S73136	09/04/2024	n.a.	n.a.	n.a.
	Antibiotics	145394	30/07/2022	n.a.	n.a.	n.a.
	L-Glutamine	2342286	01/12/2022	Complemented Medium	2001-EMEM	20/01/2022

2. Raw data – Human coronavirus SARS-CoV-2

Control and test

Product	Contact time (min)	Dilutions (-log)							
		P	1	2	3	4	5	6	7
Cytotoxicity									
Stainless steel support	120	0	0	0	0	0	0	0	0
Powdercoated surface	120	0	0	0	0	0	0	0	0
Cell susceptibility									
SCDLP Medium	/	44444444	44444444	44444444	44444444	44444444	10200000	0	0
Stainless steel support	/	44444444	44444444	44444444	44444444	44444444	0	0	0
Powdercoated surface	/	44444444	44444444	44444444	44444444	44444444	01000000	0	0
A0/U0									
Stainless steel support	0	44444444	44444444	44444444	10210011	0	0	0	0
	0	44444444	44444444	44444444	21032132	0	0	0	0
	0	44444444	44444444	44444444	14401200	0	0	0	0
Powdercoated surface	0	44444444	44444444	44444444	10230000	0	0	0	0
	0	44444444	44444444	44444444	14120012	0	0	0	0
	0	44444444	44444444	44444444	10111111	0	0	0	0
Suppression of product's activity									
SCDLP medium	/	44444444	44444444	44444444	12014012	0	0	0	0
	/	44444444	44444444	44444444	11002302	0	0	0	0
	/	44444444	44444444	44444444	14012000	0	0	0	0
Stainless steel support	/	44444444	44444444	44444444	11002140	00010001	0	0	0
	/	44444444	44444444	44444444	10012400	0	0	0	0
	/	44444444	44444444	44444444	14420022	01000000	0	0	0
Powdercoated surface	/	44444444	44444444	44444444	32032022	0	0	0	0
	/	44444444	44444444	44444444	33300201	0	0	0	0
	/	44444444	44444444	44444444	22003232	02000000	0	0	0
Test									
Stainless steel support	120	44444444	44444444	44444444	14010000	0	0	0	0
	120	44444444	44444444	44444444	10001000	0	0	0	0
	120	44444444	44444444	44444444	10000000	0	0	0	0
Powdercoated surface	120	44444444	44444444	12030200	0	0	0	0	0
	120	44444444	44444444	20200011	0	0	0	0	0
	120	44444444	44444444	14012120	0	0	0	0	0

Explanations:
 - 1-4: degrees of CPE in 8 cell culture unit (microtiter plate)
 - 0: no virus present
 - n.a: not applicable
 - n.d: not done

END OF REPORT