



ISO 21702:2019

T.C. SAĞLIK BAKANLIĞI
HALK SAĞLIĞI GENEL MÜDÜRLÜĞÜ
Çevre Sağlık Dairesi Başkanlığı
Yetkili Laboratuvar

Measurement of antiviral activity on plastics and other non-porous surfaces

Test Results Report



This report was prepared by
ANTİMİKROP AR-GE ve BİYOSİDAL ANALİZ MERKEZİ
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No: 37/1 Çankaya/Ankara

for

SMART PAINT MANUFACTURING SDN. BHD.

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Customer : SMART PAINT MANUFACTURING SDN. BHD.

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1. TEST INFORMATION

Manufacturer	: SMART PAINT MANUFACTURING SDN. BHD.
Product(s)	: <i>Smart Paints Eco- Wall / Durra Super Max</i>
Storage Conditions	: Room temperature
Sample Code	: COV-21-0303
Sample Acceptance Date	: 24.09.2021
Study Period	: 06.10.2021-11.10.2021
Test Name	: Antiviral efficacy test for the product of <i>Smart Paints Eco- Wall / Durra Super Max</i>
Test Method	: ISO 21702:2019- Measurement of antiviral activity on plastics and other non-porous surfaces
Control Test Sample	: Glass without antimicrobial coating
Virus (es)	: <i>SARS-CoV-2 (COVID-19) Clinical Isolate (GenBank: MT955161.1)</i>
Contact Time	: 24 Hour
Test Temperature	: 24 °C ±1 °C
Virus-Cell Incubation °C	: 37 °C ±1 °C, 5 % CO ₂

2. TEST METHOD

Stock cultures of *SARS-CoV-2 (COVID-19) Clinical Isolate (GenBank: MT955161.1)* were prepared using Vero E6 cell line cultured in DMEM-10 (Dulbecco's Minimum Essential Medium containing 10% FBS (fetal bovine serum), penicillin / streptomycin / Amp.B).

In each experiment, 9 of *Smart Paints Eco- Wall / Durra Super Max* Test samples (treated) of 50 mm x 50 mm dimensions were used, while 12 of the Reference control samples (untreated) of the same size were used. Three samples of each the treated and untreated control samples were used for cytotoxicity and neutralization tests, and 3 of untreated control surfaces with the virus inoculum were processes at t0 time. The others were inoculated with 0.4 ml of stock virus and left for the exposure time of 24 hours at 24°C ± 1°C. At the end of the exposure time, a harvest was obtained by washing each samples with 10 ml of DMEM-10. Next, log dilutions of harvest obtained from the samples were transferred to 96-well tissue culture plates containing cells and incubated at 37 °C ± 1 °C, 5% CO₂ incubator. After 4 days of incubation, cytopathic effect was evaluated under inverted microscope and the virus TCID₅₀ titer recovered was calculated according to the Spearman-Kärber formula. Virucidal (virus killing) activity was calculated in terms of Log and % activity by comparing the average TCID₅₀ value of control samples with the mean TCID₅₀ value of test samples.

3. SUMMARY TEST RESULT:

Compared to the untreated control surfaces, *Smart Paints Eco- Wall / Durra Super Max* treated surfaces killed *SARS-CoV-2 virus* at rate of > 99.99 % within 24 hours.

4.2.1. Smart Paints Eco- Wall / Durra Super Max - SARS-CoV-2 (COVID-19) Clinical Isolate (GenBank: MT955161.1) Raw Data

TEST	Material	Log dilution- cpe evaluation						
		-1	-2	-3	-4	-5	-6	-7
Virus Titration	Stock Virus	444444	444444	444444	444444	444444	044343	012000
t0 infectivity dose	Control 1	4444	4444	4444	4444	4024	0000	
		4444	4444	4444	4444	0204	0000	
	Control 2	4444	4444	4444	4444	0000	0000	
		4444	4444	4444	4444	0440	0000	
	Control 3	4444	4444	4444	4444	4440	0000	
		4444	4444	4444	4444	4344	0000	
Cytotoxicity	Control 1	0000	0000	0000	-	-	-	-
		0000	0000	0000	-	-	-	-
	Control 2	0000	0000	0000	-	-	-	-
		0000	0000	0000	-	-	-	-
	Control 3	0000	0000	0000	-	-	-	-
		0000	0000	0000	-	-	-	-
Neutralization (interference)	Control 1	4444	4444	4444	4044	0034	0000	-
		4444	4444	4444	4444	4444	0000	-
	Control 2	4444	4444	4444	4444	0404	0000	-
		4444	4444	4444	4444	0404	0000	-
	Control 3	4444	4444	4444	4444	4004	0000	-
		4444	4444	4444	4444	4444	0000	-
T24 Hours	Control 1	4444	4444	4444	4444	4400	0000	-
		4444	4444	4444	4444	0000	0000	-
	Control 2	4444	4444	4444	0444	0000	0000	-
		4444	4444	4444	4000	0000	0000	-
	Control 3	4444	4444	4444	4444	0000	0000	-
		4444	4444	4444	4044	0000	0000	-
T24 Hours	Test 1	0000	0000	0000	0000	0000	0000	-
		0000	0000	0000	0000	0000	0000	-
	Test 2	0000	0000	0000	0000	0000	0000	-
		0000	0000	0000	0000	0000	0000	-
	Test 3	0000	0000	0000	0000	0000	0000	-
		0000	0000	0000	0000	0000	0000	-

5. Archive:

All original raw data obtained specifically for this study will be archived. This original data includes, but is not limited to, the following information: Notebooks, data sheets and calculations, all handwritten raw data and controlled copy of the final work report.

6. Keeping Test Material:-

Remaining test and control surfaces will be stored at room temperature for 3 months as the witness samples used during the period of this study.

Appendix-1

Following photographs showing the samples of laboratory work are included on the request made by the customer:

Fig. 1. Treated and Untreated surfaces each inoculated with Sars-CoV-2 virus in sterile petri dishes. (Note that unlike the treated surfaces the inoculum on the untreated surfaces did not spread.)



Fig. 2. Sars-CoV-2 virus inoculated surfaces covered with 40x40 mm film

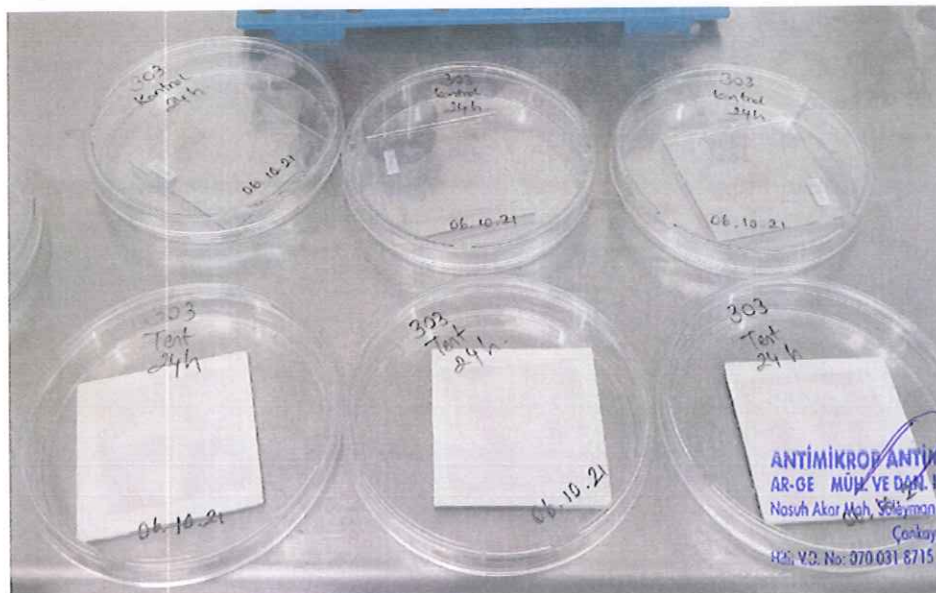


Fig. 3. Incubation at 25 C incubator with > 90 % RH for 24 hours.



Fig. 4. After 24h incubation the remaining virus on the test and control surfaces are individually extracted with medium



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Fig. 5. The harvests were individually diluted ten-fold with culture medium and seeded onto cells prepared in 96-well tissue culture plates. The plates were incubated at 37°C 5% CO₂ incubator for 96 h.

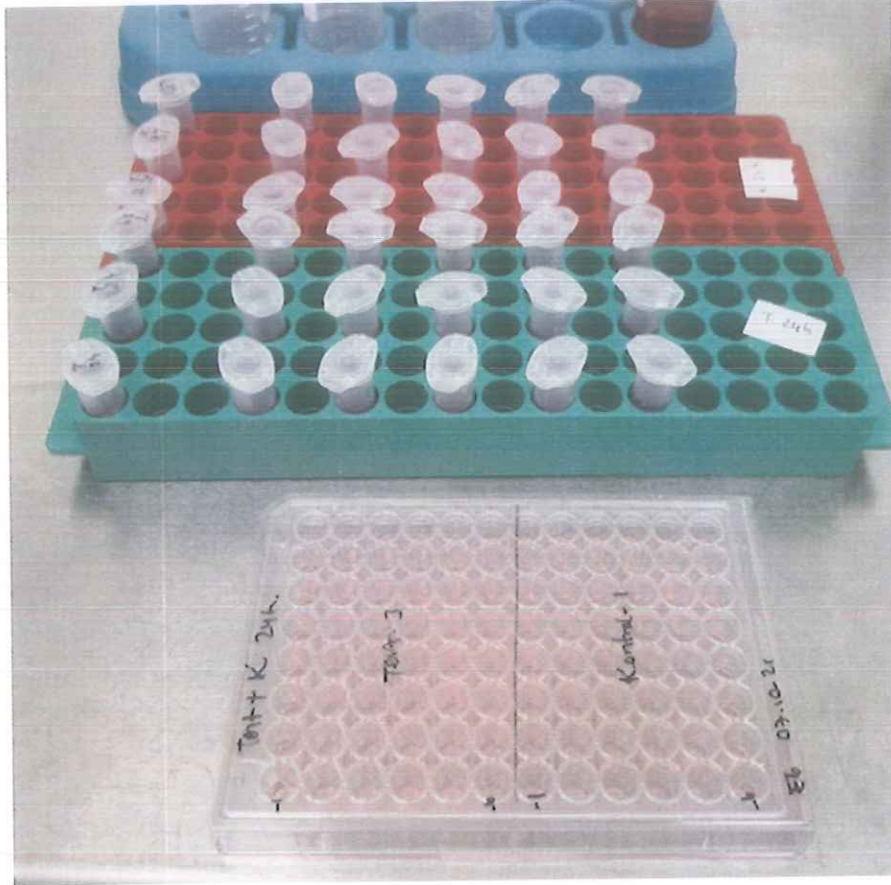
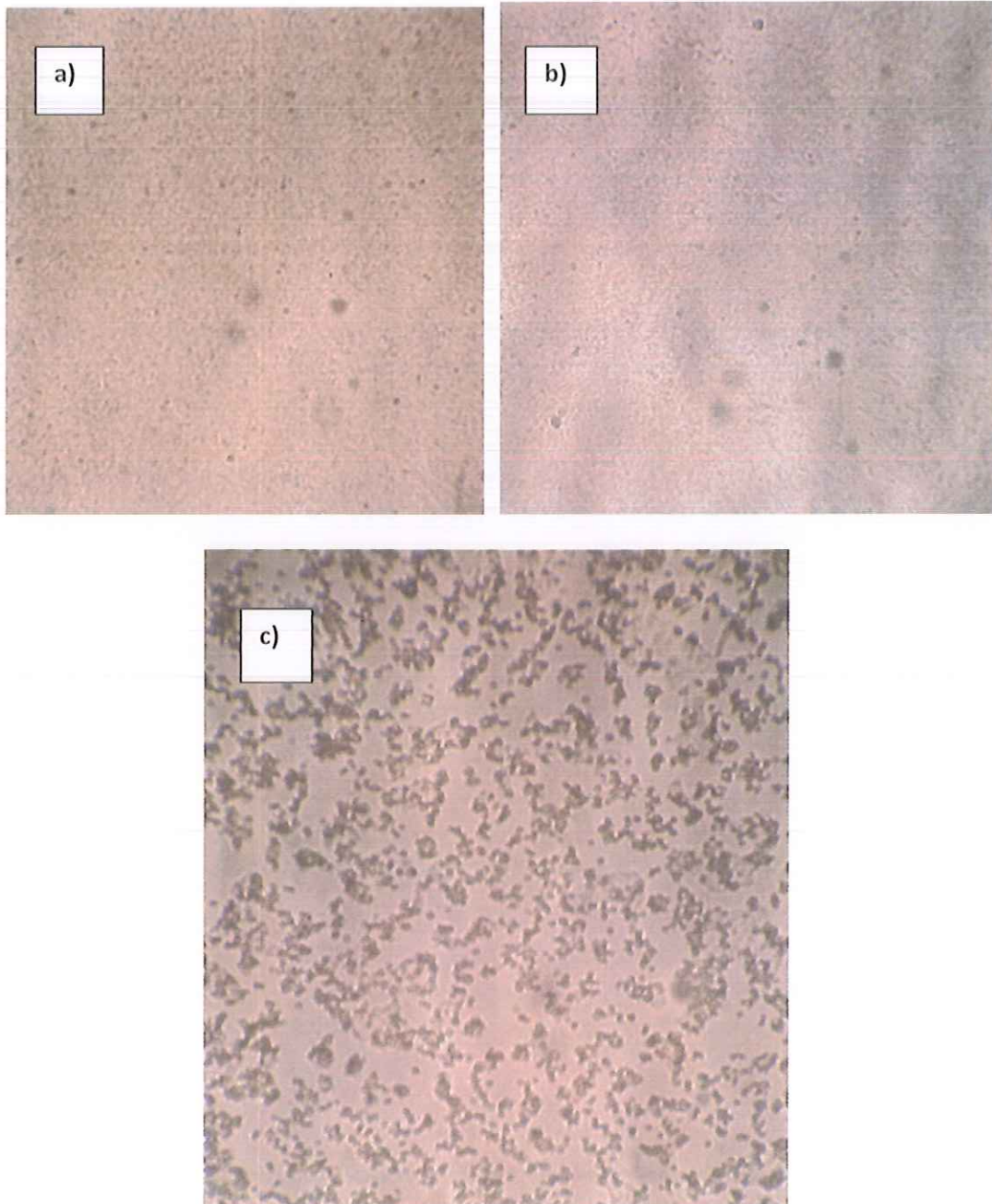


Fig. 6. After 96 h, the microscopic pictures taken from representative single wells of a) uninfected cells; b) the cells with harvest of treated (test) glass surface; c) the cells with harvest of untreated (control) glass surfaces. Note that cells receiving the harvest of treated (test) surfaces indicates no cytopathic effect (i.e. no virus) while the harvest of untreated glass surface shows the presence of extensive amount of virus induced cytopathic effect.



THIS REPORT CONSISTS OF 8 PAGES, INCLUDING THE FRONT PAGE.