TEST REPORT

ROPIMEX R.OPEL GMBH

R2008FTSOT001-V1

14/12/2023

VirHealth

R2008FTSOT001-V1

Determination of virucidal activity of product **Ropitex** against Human coronavirus 229E and Murine norovirus with a contact time of 120 minutes at 25°C with 39%RH according to the standard **ISO 18184 (2019).**

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SERVICE PROVIDER / PLACE OF TESTING	**SAS VirHealth** Site Laennec-La Buire, 2ème étage, Bat B 7-11 rue Guillaume Paradin, 69372 Lyon Cedex 08 – France
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Quality Approval	Technical Approval
Name: Elena Giaufret Function: Quality Manager Done at: Lyon Date: 12/01/2024 Signature: Signé par **Elena Giaufret** 12/01/2024 14:44	Name: Damien Poizat Function: Technical Manager Done at: Lyon Date: 12/01/2024 Signature: Signé par **Damien Poizat** 12/01/2024 14:44

This report contains 13 pages

SUMMARY

CONCLUSION

The virucidal activity of the product Ropitex and the control textile Non-active textile have been tested under conditions defined by ISO 18184 (2019) protocol for a contact time of 120 minutes at 25°C against Human coronavirus 229E and Murine norovirus.

The non-active textile is the control for this test.

Human coronavirus 229E

Under experimental conditions, 120 minutes at 25°C with 39% RH, the Ropitex textile shows an virucidal activity associated with a logarithmic reduction of 1.70 log_{10} (98.00%) under the ISO 18184 (2019) protocol.

Product	Contact time	Experimental conditions	Virucidal activity Mv (log_{10})	Virucidal activity (%)
Ropitex	120 minutes	25°C 39% RH	1.70	98.00%

Murine norovirus

Under experimental conditions, 120 minutes at 25°C with 39% RH, the Ropitex textile shows an virucidal activity associated with a logarithmic reduction of 0.70 log_{10} (80.05%) under the ISO 18184 (2019) protocol.

Product	Contact time	Experimental conditions	Virucidal activity Mv (log_{10})	Virucidal activity (%)
RopiTex	120 minutes	25°C 39% RH	0.70	80.05

CONTRACTUAL DOCUMENTS

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

ISO 18184 (2019)

Addition and/or deviation from the reference method of the above-mentioned standard: None

On behalf of the company ROPIMEX R.OPEL GMBH

The test was carried out on the following combination of textiles

Active textile: Ropitex

Control textile: Non-active textile

The results and any conclusion in this report apply to the sample as it was provided

The present performance is defined by the following documents

Quote N°0060 from 18/06/2020

DATA ON SAMPLES AND TEST CONDITIONS

Samples identification (information provided by client)

Name of the active textile: Ropitex	
Date of receipt: 18/06/2020	
Appearance of the active textile: Polyester	Colour: White
Weight: 0.43g	Thickness: 0.5 mm
Name of the control textile: Non-active textile	
Date of receipt: 18/06/2020	Colour: White
Appearance of the control textile: Polyester	Thickness: 0.5 mm
Storage conditions: Ambient	

Experimental conditions (information provided by client)

Micro-organisms	Human coronavirus 229E Murine norovirus
Contact time (hours)	120 minutes
Contact temperature (°C)	25°C ±1
Relative humidity (%)	39%

Test conditions (information provided by VirHealth)

Date of testing	29/07/2020
Inoculum volume	200µL
Neutralization method	20 ml of SCDLP Medium
Quantification method	Endpoint titration on permissive cells
Number of wells / dilution	8
Incubation temperature	37°C ±1

RESULTS

Results on Human coronavirus 229E

Virucidal activity of Ropitex textile against Human coronavirus 229E for a contact time of 120 minutes at 25 °C with 39% RH.

Cell susceptibility

Textile	log_{10} $TCID_{50}$ / ml	
SCDLP Medium	5.3	
RopiTex Active textile	5.0	
Non-active textile Control textile	5.3	
Difference < 1log_{10}	☒ Yes	☐ No

Determination of cytotoxicity

The test textile cytotoxicity is determined by reading the cytopathic effect (CPE) on MRC5 permissive cells and quantified by the $TCID_{50}$ technique.

For a viral recovery on the textile, the textiles are submerged in 20 ml of SCDLP medium (recuperation buffer). The recuperation buffer cytotoxicity is determined by reading the cytopathic effect (CPE).

Under the test conditions, the recuperation buffers from Ropitex and the control support did not show cytopathic effects on MRC5 cells for a contact time of 120 minutes at 25 °C with 39% relative humidity.

Inactivation of virucidal activity

Textile	log_{10} $TCID_{50}$ / ml
Ropitex Active textile	4.8
Non active textile Control textile	4.8
log_{10} ($TCID_{50}$/ml of control textile) - log_{10} ($TCID_{50}$/ml of active textile) ≤ 0.5	
☒ Yes	☐ No

Test

The raw data for the activity of the textile Ropitex and the control textile against Human coronavirus 229E under the test conditions (120 minutes at 25 C with 39% relative humidity) are presented in the appendices.

The results have been determined by a visual reading of the cytopathic effects (CPE) and quantified by the $TCID_{50}$ technique on MRC5 cells.

See Table 1 – Results by cytopathic reading

Table 1 – Results by cytopathic reading

Control Textile	Cytotoxicity (log_{10} $TCID_{50}$)	Specimen	Va (log_{10} $TCID_{50}$)	Vb120 (log_{10} $TCID_{50}$)
Non-active textile	0.5	L1	4.7	4.7
		L2	4.9	4.4
		L3	4.7	4.7
		Average	4.8	4.6
		M (log_{10} $TCID_{50}$)	/	**0.2**

Active Textile	Cytotoxicity (log_{10} $TCID_{50}$)	Specimen	Va' (log_{10} $TCID_{50}$)	Vc120 (log_{10} $TCID_{50}$)
Ropitex	0.5	L1	4.7	3.2
		L2	4.7	2.9
		L3	4.9	3.2
		Average	4.8	3.1
		Mv (log_{10} $TCID_{50}$)	/	**1.70**

Explanations

- *M is the reduction value and must be ≤ 1.0 log_{10} $TCID_{50}$*
- *log (Va) is the average of the common logarithm of the number of $TCID_{50}$ recovered from three untreated test specimens immediately after inoculation*
- *log (Vb) is the average of the common logarithm of the number of $TCID_{50}$ recovered from three untreated test specimens*
- *Mv is the virucidal activity value*
- *log (Va') is the average of the common logarithm of the number of $TCID_{50}$ recovered from three treated test specimens immediately after inoculation*
- *log (Vc) is the average of the common logarithm of the number of $TCID_{50}$ recovered from three treated test specimens*

Results on Murine norovirus

Virucidal activity of Ropitex textile against Murine norovirus for a contact time of 120 minutes at 25°C with 39% RH.

Cell susceptibility

Textile	log_{10} $TCID_{50}$ / ml	
SCDLP Medium	7.9	
Ropitex Active textile	8.0	
Non-active textile Control textile	8.0	
Difference < 1log_{10}	☒ Yes	☐ No

Determination of cytotoxicity

The test textile cytotoxicity is determined by reading the cytopathic effect (CPE) on RAW264.7 permissive cells and quantified by the $TCID_{50}$ technique.

For a viral recovery on the textile, the textiles are submerged in 20 ml of SCDLP medium (recuperation buffer). The recuperation buffer cytotoxicity is determined by reading the cytopathic effect (CPE).

Under the test conditions, the recuperation buffers from Ropitex and the control support did not show cytopathic effects on RAW264.7 cells for a contact time of 120 minutes at 25°C with 39% relative humidity.

Inactivation of virucidal activity

Textile	log_{10} $TCID_{50}$ / ml
Ropitex Active textile	7.7
Non-active textile Control textile	7.8
log_{10} ($TCID_{50}$/ml of control textile) - log_{10} ($TCID_{50}$/ml of active textile) ≤ 0.5	
☒ Yes	☐ No

Test

The raw data for the activity of the textile Ropitex and the control textile against Murine norovirus under the test conditions (120 minutes at 25°C with 39% relative humidity) are presented in the appendices.

The results have been determined by a visual reading of the cytopathic effects (CPE) and quantified by the $TCID_{50}$ technique on RAW264.7 cells.

See Table 2 – Results by cytopathic reading

Table 2 – Results by cytopathic reading

Control Textile	Cytotoxicity (log_{10} $TCID_{50}$)	Specimen	Va (log_{10} $TCID_{50}$)	Vb_{120} (log_{10} $TCID_{50}$)
Non-active textile	0.5	L1	7.9	7.4
		L2	7.7	7.7
		L3	7.7	7.7
		Average	7.8	7.6
		M (log_{10} $TCID_{50}$)	/	**0.2**

Active Textile	Cytotoxicity (log_{10} $TCID_{50}$)	Specimen	Va' (log_{10} $TCID_{50}$)	Vc_{120} (log_{10} $TCID_{50}$)
Ropitex	0.5	L1	7.9	6.9
		L2	7.7	7.2
		L3	7.4	7.2
		Average	7.7	7.1
		Mv (log_{10} $TCID_{50}$)	/	**0.70**

Explanations

- *M is the reduction value*
- *log (Va) is the average of the common logarithm of the number of $TCID_{50}$ recovered from three untreated test specimens immediately after inoculation*
- *log (Vb) is the average of the common logarithm of the number of $TCID_{50}$ recovered from three untreated test specimens*
- *Mv is the virucidal activity value*
- *log (Va') is the average of the common logarithm of the number of $TCID_{50}$ recovered from three treated test specimens immediately after inoculation*
- *log (Vc) is the average of the common logarithm of the number of $TCID_{50}$ recovered from three treated test specimens*

APPENDICES

Materials and reagents

Cells and viral strains

	Name	Number of passages
Cell A	MRC5 (ATCC CCL 171)	19
Viral strain A	Human coronavirus 229E (ATCC VR-740)	N.A.
Cell B	RAW264.7	15
Viral strain B	Murine norovirus	N.A.

Raw data – Human coronavirus 229E

Control and test

Product	Contact time	Dilutions (-log)							
		P	1	2	3	4	5	6	7
Cytotoxicity									
Non-active textile	120 minutes	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
Ropitex	120 minutes	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
Cell susceptibility									
SCDLP Medium	/	44444444	44444444	44444444	44444444	33333300	00000000	00000000	00000000
Non-active textile	/	44444444	44444444	44444444	44444444	33330000	00000000	00000000	00000000
Ropitex	/	44444444	44444444	44444444	44444444	21222200	00000000	00000000	00000000
VA/VA'									
Non-active textile	0	44444444	44444444	22222220	00000000	00000000	00000000	00000000	00000000
	0	44444444	44444444	33333330	11000000	00000000	00000000	00000000	00000000
	0	44444444	44444444	22222200	10000000	00000000	00000000	00000000	00000000
Ropitex	0	44444444	44444444	22222220	00000000	00000000	00000000	00000000	00000000
	0	44444444	44444444	22222222	10000000	00000000	00000000	00000000	00000000
	0	44444444	44444444	33333330	00000000	00000000	00000000	00000000	00000000
Suppression of product's activity									
Non-active textile	/	44444444	44444444	44444444	22222222	11000000	00000000	00000000	00000000
	/	44444444	44444444	44444444	33333333	10000000	00000000	00000000	00000000
	/	44444444	44444444	44444444	22222222	10000000	00000000	00000000	00000000
Ropitex	/	44444444	44444444	44444444	22222222	00000000	00000000	00000000	00000000
	/	44444444	44444444	44444444	22222222	10000000	00000000	00000000	00000000
	/	44444444	44444444	44444444	33333333	11100000	00000000	00000000	00000000
Test									
Non-active textile	120 minutes	44444444	44444444	22222220	00000000	00000000	00000000	00000000	00000000
	120 minutes	44444444	44444444	11111100	10000000	00000000	00000000	00000000	00000000
	120 minutes	44444444	44444444	22222222	10000000	00000000	00000000	00000000	00000000
Ropitex	120 minutes	33333333	11100000	00000000	00000000	00000000	00000000	00000000	00000000
	120 minutes	33333333	10000000	00000000	00000000	00000000	00000000	00000000	00000000
	120 minutes	44444444	11100000	00000000	00000000	00000000	00000000	00000000	00000000

Raw data - Murine norovirus

Control and test

Product	Contact time	Dilutions (-log)							
		P	1	2	3	4	5	6	7
Cytotoxicity									
Non-active textile	120 minutes	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
Ropitex	120 minutes	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
Cell susceptibility									
SCDLP Medium	/	44444444	44444444	44444444	44444444	44444444	44444444	44444444	33300000
Non-active textile	/	44444444	44444444	44444444	44444444	44444444	44444444	44444444	22220000
Ropitex	/	44444444	44444444	44444444	44444444	44444444	44444444	44444444	22220000
VA/VA'									
Non-active textile	0	44444444	44444444	44444444	44444444	44444444	44444444	20000000	00000000
	0	44444444	44444444	44444444	44444444	44444444	44444440	00000000	00000000
	0	44444444	44444444	44444444	44444444	44444444	44444440	00000000	00000000
Ropitex	0	44444444	44444444	44444444	44444444	44444444	44444440	22000000	00000000
	0	44444444	44444444	44444444	44444444	44444444	44444440	00000000	00000000
	0	44444444	44444444	44444444	44444444	44444444	44443000	00000000	00000000
Suppression of product's activity									
Non-active textile	/	44444444	44444444	44444444	44444444	44444444	44444444	33333333	11000000
	/	44444444	44444444	44444444	44444444	44444444	44444444	22222221	12000000
	/	44444444	44444444	44444444	44444444	44444444	44444444	22222222	11200000
Ropitex	/	44444444	44444444	44444444	44444444	44444444	44444444	33333333	11000000
	/	44444444	44444444	44444444	44444444	44444444	44444444	22222222	10000000
	/	44444444	44444444	44444444	44444444	44444444	44444444	11111111	11000000
Test									
Non-active textile	120 minutes	44444444	44444444	44444444	44444444	44444444	22222000	00000000	00000000
	120 minutes	44444444	44444444	44444444	44444444	44444444	33333330	00000000	00000000
	120 minutes	44444444	44444444	44444444	44444444	44444444	22222220	00000000	00000000
Ropitex	120 minutes	44444444	44444444	44444444	44444444	44444444	40000000	00000000	00000000
	120 minutes	44444444	44444444	44444444	44444444	44444444	32200000	00000000	00000000
	120 minutes	44444444	44444444	44444444	44444444	44444444	22200000	00000000	00000000

END OF REPORT