Protegiendo siempre a tus seres más queridos

SPRADLING®

SUPERIOR PROTECTION: COATED FABRICS SAFEGUARDED WITH

PERMABLOK3®
ADVANCED VINYL PROTECTION

Nuestras tapicerías técnicas para proyectos siempre han ofrecido una protección superior frente a gérmenes, manchas y abrasión. Pensando en los problemas principales que se encuentran en las instalaciones destinadas a los sectores de la sanidad, hostelería y transporte masivo, desarrollamos **PERMABLOK$^{3®}$**, un probado recubrimiento protector diseñado para conseguir una barrera resistente y eficaz que asegure espacios más higiénicos.

PROTECCIÓN SUPERIOR ANTIGÉRMENES

Usar nuestras Tapicerías Técnicas con acabado **PERMABLOK$^{3®}$** permite mantener baja la concentración de gérmenes. Además, también evita la proliferación de hongos, moho y esporas de moho, que pueden provocar olores desagradables y reacciones alérgicas. Con su protección antifúngica incomparable, nuestros tejidos técnicos para proyectos resisten también a las bacterias Gram positivas y Gram negativas, los hongos filamentosos y las levaduras.

ACTIVIDAD VIRUCIDA

PERMABLOK$^{3®}$ ofrece una barrera efectiva contra virus, demostrándose así con las siguientes certificaciones:

- **ISO 18184**: reducción de la presencia de Coronavirus* en más del 90% durante la primera hora de contacto.
- **ISO 21702:** reducción de un 99,9% de la actividad de Coronavirus* durante las primeras 24 horas de exposición en la superficie.

PROPIEDADES BACTERIOSTÁTICAS

PERMABLOK$^{3®}$ asegura superficies tapizadas libres de bacterias a través de la siguiente certificación:

- **ISO 22196**: Valor de actividad antibacteriana** de R>2.

*Test efectuado con material expuesto a Coronavirus Felino (de la misma familia Coronaviridae y estructura y mecanismos similares al SARS-Cov2).

** Test efectuado con material expuesto a Staphylococcus aureus, Staphylococcus aureus (MRSA), Escherichia coli y Klebsiella pneumoniae.

PROTECCIÓN SUPERIOR ANTIMANCHAS

PERMABLOK$^{3®}$ hace que nuestros tejidos técnicos sean una solución de tapizado realmente fácil de limpiar tanto las manchas más cotidianas como las producidas por grasa, sangre, protección solar, lápiz, salsa de tomate y rotuladores negros, como otro tipo de manchas más complicadas comunes en espacios públicos.

ALTA RESISTENCIA A LA ABRASIÓN

Para asegurar una larga durabilidad y hacer que el mobiliario y las superficies tapizadas se mantengan como nuevas, **PERMABLOK$^{3®}$** hace que los tejidos se mantengan resistentes a los síntomas de deterioro, como por ejemplo el desgaste, los desgarros o la pérdida de flexibilidad.

GUÍA DE LIMPIEZA Y MANTENIMIENTO

SIGUE NUESTRAS RECOMENDACIONES DE LIMPIEZA Y DESINFECCIÓN PARA QUE NUESTROS TAPICERÍAS TECNICAS MANTENGAN SU APARIENCIA Y SUS PROPIEDADES PROTECTORAS

Para mantener tu entorno libre de virus y bacterias, es esencial seguir una limpieza regular. Las propiedades de fácil limpieza de nuestros tejidos técnicos no sólo hacen que esta tarea sea rápida, sino que también aseguran la durabilidad de tu mobiliario y superficies.

MANTENIMIENTO DIARIO Y LIMPIEZA

1. Limpia toda la superficie utilizando una mezcla de 1:10 de jabón líquido y agua. No uses jabones o soluciones de limpieza que contengan alcohol, cetonas, xileno, acetatos os disolventes (alcoholes minerales/blancos).
2. Elimina por completo el exceso la mezcla con un paño blanco, limpio y húmedo.
3. Seca la superficie.

DESCÁRGATE NUESTRA GUÍA COMPLETA DE LIMPIEZA Y MANTENIMIENTO

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

Microbiological Solutions Limited (MSL)
Gollinrod, Walmersley, Bury, BL9 5NB, UK

Angela Davies, CEO

Customer: Spradling Europe
Contact name: David Sentance
Email: d.sentance@spradling.group
Address: Unit 5 Moor Brook Park
Didcot
Oxfordshire OX11 7HP
PO/Quote number: Q003057/3
Report Date: 26/09/2020
Issue Number: 2

_____	_____
Megan Barrett	Peter Thistlethwaite
Laboratory Manager	Technical Projects Manager

Test information		Deviation
Name of Product	Permablok3'	
Batch Number & Expiry Date	N/S	
Date of Delivery	25/06/2020	
Period of Analysis	25/08/2020-01/09/2020	
Manufacturer / Supplier	Spradling Europe	
Storage Conditions	Ambient	
Appearance of the Product	Cream fabric	
Neutralisation Method	Dilution	
Test Concentrations	As supplied	
Test Temperature	25^0C $\pm$ 1°C	
Temperature of Incubation	37°C ±1°C	
Identification of the Viral Strains:	Feline coronavirus, Strain Munich	
Contact Times	60 minutes and 90 minutes	

Test Result Summary

The test fabric showed the following log reductions when tested against Feline coronavirus:
90 minutes – 1.32log (95.21%)
60 minutes – 1.14 log (92.74%)

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.

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Tel: 0844 824 6003
Email: info@mls.io
Web: www.msl.io
Company number: 4218514

Test identification Reference: **J002012-2** ISO 18184:2019

Test Results

0 hours		
Sample	Log recovery	Average
Control 1	5.17	
Control 2	5.17	
Control 3	5.29	5.21

Controls		
Initial inoculum	7.33	Valid
Cytotoxicity Test	4.17	Valid
Cytotoxicity Control	4.21	Valid

Contact time:60 minutes				
Sample	Log recovery	Average	Reduction	Percentage
Control 1	4.96			
Control 2	5.08			
Control 3	4.42	4.82	0.39	59.16%
Test 1	4.04			
Test 2	4.08			
Test 3	4.08	4.07	1.14	92.74%

Contact time:90 minutes				
Sample	Log recovery	Average	Reduction	Percentage
Control 1	4.50			
Control 2	4.67			
Control 3	4.54	4.57	0.64	77.03%
Test 1	3.83			
Test 2	3.92			
Test 3	3.92	3.89	1.32	95.21%

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

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Customer Report

Antiviral Testing

Project ID *0720-DNV-01-4*

Project Initiation Date 7/13/2020

prepared for:

SPRADLING INTERNATIONAL, GMBH

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Antimicrobials ○ Biodegradation ○ Toxicology ○ Analytics ○ Product Development

Table of Contents

Compliance Statement

Testing is conducted according to the required criteria established for ISO 17025 Accredited laboratories. The laboratory is independently audited, verifying this compliance.

This report is governed by and incorporates by reference, the conditions of testing as posted on the date of issuance, and is intended for the identified Project Owners exclusive use. This report sets forth our findings solely with respect to test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar identical product unless specifically and expressly noted.

Abstract

The ISO 21702 provides a test method for the quantitative evaluation of virucidal activity on plastics and other non-porous surfaces. Products tested are intended to be treated antiviral products, that are tested against the specified virus.
The basis of the test method is the incubation of the viral inoculum in contact with the test sample for a duration of 24 hours without drying of the inoculum. Following this exposure, the inoculated virus is recovered, and the concentration of the infective virus is determined. The antiviral performance is determined by a comparison of the recovered virus from the untreated material and treated material after the 24-hour incubation.

The antimicrobial performance is reported as both the Log10 and % Reduction relative to the untreated control sample.

Results and Discussion

Results are provided in the Result Data Tables and Addendum

Test Results are provided in the data tables section, followed by a detailed listing of raw data in the report addendum.

Report Result Tables

Sample List

Sample #	Method Name	Sample Name	Sample Notes
Project - Images			
1		WITH PERMABLOK3	
ISO 21702 - Measurement of antiviral activity on plastics and other non-porous surfaces			
1		WITH PERMABLOK3	
2		SBSC Untreated Control	

Test Method **ISO 21702 - Measurement of antiviral activity on plastics and other non-porous surfaces**

Sample # 1 **WITH PERMABLOK3**

	Interval	Result
Inoculum: *Feline Coronavirus*		
Notes Section		
percent reduction = 99.97; cytotoxic effect noted at T0	**24** hr	**3.5**

Sample # 2 **SBSC Untreated Control**

	Interval	Result
Inoculum: *Feline Coronavirus*		
Notes Section		
	24 hr	**195000** TCID50 / sq cm
	0 hr	**6150000** TCID50 / sq cm

Report Image

Sample # **1** **WITH PERMABLOK3**

Test Method **Project - Images**

Inoculum ***None***

Image: **sample** ***Timepoint:*** **time - 0**

Introduction

ISO 21702 specifies a method of evaluating virucidal activity of non-porous surfaces.

Each product was tested using clean test condition (no additional soil) .

Unless otherwise specified, secondary effects of antibacterial treatments, the measured antimicrobial performance, or the durability of a measured activity are not covered by the standard. The standard is not intended to be used or referenced as a method to document or claim antimicrbial performance unless indicated by the test report. The determinations of product performance within a given environment can vary dramatically, and must be specifically documented and then determined within the context of a specific project plan.

Recommended Reading Online Technical Resources

Guidance on antimicrobial preservation http://www.situbiosciences.com/microbial-control-testing/

Method Summary https://www.situbiosciences.com/product/iso-21702-antiviral-activity-on-plastics-and-other-non-porous-surfaces/

Sample Appearance

Each test sample was submitted as an approximately 2x2" flat surface. Each sample was covered with a paraffin film 2.5x2.5 cm square.

Methods

Project - Images

Project images are provided for the submitted test samples. Images are taken for the samples as received to provide a reference for the materials submitted for testing. The provided images may or may not indicate other aspects of the sample condition but no analysis or inspection of the sample is conducted unless otherwise specifically noted in the project report.

ISO 21702 - Measurement of antiviral activity on plastics and other non-porous surfaces

The ISO 21702 method is used to evaluate the virucidal efficacy of a non-porous product. Testing can incorporate different exposure times, soiling, and virus types and other variables according to the test standard or specific needs of a product. The most common test conditions employ the standard method protocol requiring a 24-hour exposure to the test material depending on the intended use of the product. Test virus are prepared in advance of the testing followed by a determination of viral titer. The inocula created is then utilized as the inocula for the exposure of the test material to the virus.

Project List	*(notes)*
1	WITH PERMABLOK3
2	SBSC Untreated Control

Testing

Inoculum Preparation

A known viral titer suspension is prepared to a concentration of at least 1E6 TCID50 / ml. Passaged of the virus are not used beyond ten passes from the original seed culture.

Experimental Conditions

Following inoculation, the samples are incubated at 25 C +/- 1C (unless otherwise specified). The incubation is conducted to prevent the inoculum from drying while in contact with the test surface. Following the incubation period, the virus is recovered in neutralizing media and then diluted for culturing.

Recovery of virus from test specimens.

Two time points are created for each test item, a washout of the inoculated sample is collected immediately after inoculation by addition of the selected neutralizer solution by placing the sample into a vial and adding 10 ml of the neutralizer, followed by vortexing.

A second recovery is created following the intended incubation time (24 hr), after which the sample is placed into a vial with 10 ml of the neutralizing solution and vortexed.

Following the test sample neutralization, aliquotes of the sample are recovered and used to determine the infective titer following the respective incubation periods.

Reagents

Dulbecco's Modified Eagle Medium (DMEM; EM-1)
Soybean Casein Lecithin Polysorbate 80 Medium (SCDLP)
Phosphate Buffered Saline (PBS)
Formaldehyde solution (3.7%)
Crystal Violet (0.5%)
Fetal bovine serum
Viral Maintenance medium
Typsin
Ethylenediaminetetraacetic acid solution (EDTA)
Laboratory RO water, deionized

Equipment List

Thermo Orbital Shaker Incubator
Scales (Mettler H80, Mettler PM-11K, Mettler MS104S/03)
Nuaire BSL 2 cabinet
Nuaire water-jacketed incubator
Nikon inverted microscope

Vortex mixer
Centrifuge
Liquid Nitrogen Dewar
MarketForge Autoclave
Hach pH Meter / O2 measure / conductivity meter
Dwyer Hygrometer
Gilson Pipettes

Test Organisms (by Method)	***(Inventory ID / lot #)***
ISO 21702 - Measurement of antiviral activity on plastics and other non-porous surfaces	
Feline Coronavirus, strain Munich (CCL-94 Eu cell Host)	FIPV

Sample Preparations

Each test substance was prepared according to the analytic method requirements.
Each test sample is prepared in triplicate for each time point.
As available, the samples are cut into a piece approximately 50x50 mm. Sample variability is accommodated as needed for the standard test; notes regarding differences in the sample characteristic are recorded in the report summary.

Ideally, the test sample will be flat and non-hydrophobic and allow layering of the inoculum over the sample surface.

Calculations

End-point dilutions are conducted with the recovered virus inocula using serial log10 dilution factors. TCID50 (Spearman-Karber; modified by M. A. Ramakrishnan) is used to determine the concentration of the inoculated virus based on the outcome of the end-point dilution resulting in the CTE of the host cells. It represents the end-point dilution (average) of the host cell monolayers exhibiting the CTE.

Log10 50% end-point Dilution = - [(total number of CTE wells / total number of dilution replicates) + 0.5] x log dilution factor

R = - [Total CTE / replicate count per dilution) + 0.5] x Log dilution factor

R = The log 50% end-point dilution

Total CTE - is the average of the common logarithm of the number of viable bacteria, in cells/cm2, recovered from the untreated test specimens immediately after inoculation;

Replicate count per dilution - the numbers of well replicates inoculated at each dilution

Log dilution factor - is the dilution factor used for each serial dilution (typically 10x or log10(10) = 1)

Antiviral Activity Value

R= U(t24)-C(t24)

R = the antiviral activity value
C(t24) = the common logarithm average of 3 infectivity titer values after 24 hours from the untreated material
U(t24) = the common logarithm average of 3 infectivity titer values after the contact time (24 hr) with the treated (test) sample

Statistical Methods

Replicate data are utilized in the calculation by the Spearman-Karber method, no additional statistical analysis is conducted.

* This report is governed by and incorporates by reference the conditions of testing as posted on the date of issuance and is intended for the identified Project Owners exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our company name or Service Mark is permitted only with our prior written consent. All images supplied as part of the report are provided as test result edification only and are the sole property of Situ Biosciences LLC and are copyright protected. Any exemption to the copyright of the report or images provided will be explicitly noted in this report.

This report sets forth our findings solely with respect to test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar identical product unless specifically and expressly noted. Our report includes all tests requested and the results thereof based upon the information provided. Written notification within 60 days from the date of issuance of this report is required to address any material error or omission caused by the handling of the samples. Any such notification shall specifically address the issues related to the test samples supplied and testing conducted as provided in this report. A failure to raise such an issue within the prescribed time shall constitute the unqualified acceptance of the completeness of this report, the testing conducted, and the correctness of the report contents.

d.p. Satchell, Ph.D.

Manager
Situ Biosciences LLC

Spearman-Karber Method (Modified, Ramakrishnan MA)

Titer	Virus	Control (T0)	Control (Tx)	Sample (T0)	Sample (Tx)
replicate count	6	6	6	6	6
dilution factor [D]	10	10	10	10	10
washout volume (ml) [V]	20	20	20	20	20
sample area (sq cm) [A]	6.5	6.5	6.5	6.5	6.5
inoculation volume (ml)	0.2	0.2	0.2	0.2	0.2
dilution factor (df)	*(+)*	*(+)*	*(+)*	*(+)*	*(+)*
10^0	T	T	T	T	T
10^-1	6	6	6	T	0
10^-2	6	6	6	0	0
10^-3	6	6	4	0	0
10^-4	6	6	4	0	0
10^-5	4	6	1	0	0
10^-6	0	0	0	0	0
10^-7	0	0	0	0	0
Cell Blank	0	0	0	0	0

Infectivity Titer (N)	Log10(TCID50/ well)	Alog(TCID50/well) [C]	TCID50/sq cm [10*C*D*V]/A
Virus	4.7	4.6E+04	**2.86E+06**
Control (T0)	5.0	1.0E+05	**6.15E+06**
Control (Tx)	3.5	3.2E+03	**1.95E+05**
Sample (T0)	0.0	1.0E+00	**6.15E+01**
Sample (Tx)	0.0	1.0E+00	**6.15E+01**

Result		Log10	Percent
Reduction	*R= U(t24)-C(t24)*	**3.5**	**99.968**
Control (T0) variability	(Lmax - Lmin)/Lmean	**0.20**	

RESULTADOS / *RESULTS*

ACTIVIDAD ANTIBACTERIANA /*ANTIBACTERIAL ACTIVITY*

Norma / *Standard*: ISO 22196:2011

Fecha ensayo / *Test date:* 30/06/2020 – 02/07/2020

Referencia muestra / *Sample reference:* REF 1: Producto con PERMABLOK3

Microorganismo utilizado/ *Test microorganism:* *Staphylococcus aureus ATCC 6538 (CECT 239)*

Resultados / *Results:*

Staphylococcus aureus ATCC 6538 (CECT 239)		
Inóculo / *Inoculum*	**ufc/ml**	**log ufc/ml**
	$3{,}4 \cdot 10^6$	6,53
Muestra control / *Control sample*		
Tiempo de contacto / *Contact time*	**ufc/cm²**	**log ufc/cm²**
0 h	11.500	4,06
24 h (B)	438.000	5,64
REF 1: Producto con PERMABLOK3		
Tiempo de contacto / *Contact time*	**ufc/ cm²**	**log ufc/cm²**
24 h (C)	<20	1,28
Valor actividad antimicrobiana (R) / *Value of antimicrobial activity*	**R= log B/C**	**4,36**

Observaciones / *Notes:*

- Se ha utilizado como control, la propia placa petri. / *It has been used like control sample, the own petri plate.*

- Se considera que la muestra presenta actividad antibacteriana a partir de un valor de R ≥ 2. / *It is considered that the sample shows antibacterial activity from a value of R ≥ 2.*

RESULTADOS / *RESULTS*

ACTIVIDAD ANTIBACTERIANA /*ANTIBACTERIAL ACTIVITY*

Norma / *Standard*: ISO 22196:2011

Fecha ensayo / *Test date:* 30/06/2020 – 02/07/2020

Referencia muestra / *Sample reference:* REF 1: Producto con PERMABLOK3

Microorganismo utilizado/ *Test microorganism:* *Klebsiella pneumoniae ATCC 4352 (CECT 8453)*

Resultados / *Results:*

Klebsiella pneumoniae ATCC 4352 (CECT 8453)		
Inóculo / *Inoculum*	**ufc/ml**	**log ufc/ml**
	$3{,}3 \cdot 10^6$	6,52
Muestra control / *Control sample*		
Tiempo de contacto / *Contact time*	**ufc/cm^2**	**log ufc/cm^2**
0 h	13.000	4,11
24 h (B)	1.600.0000	6,00
REF 1: Producto con PERMABLOK3		
Tiempo de contacto / *Contact time*	**ufc/ cm^2**	**log ufc/cm^2**
24 h (C)	<20	1,28
Valor actividad antimicrobiana (R) / *Value of antimicrobial activity*	**R= log B/C**	**4,72**

Observaciones / *Notes:*

- Se ha utilizado como control, la propia placa petri. / *It has been used like control sample, the own petri plate.*

- Se considera que la muestra presenta actividad antibacteriana a partir de un valor de R ≥ 2. /
It is considered that the sample shows antibacterial activity from a value of R ≥ 2.

RESULTADOS / *RESULTS*

ACTIVIDAD ANTIBACTERIANA /*ANTIBACTERIAL ACTIVITY*

Norma / *Standard*: ISO 22196:2011

Fecha ensayo / *Test date:* 30/06/2020 – 02/07/2020

Referencia muestra / *Sample reference:* REF 1: Producto con PERMABLOK3

Microorganismo utilizado/ *Test microorganism:* *Escherichia coli ATCC 8739 (CECT 516)*

Resultados / *Results:*

Escherichia coli ATCC 8739 (CECT 516)		
Inóculo / *Inoculum*	**ufc/ml**	**log ufc/ml**
	$3{,}9 \cdot 10^6$	6,59
Muestra control / *Control sample*		
Tiempo de contacto / *Contact time*	**ufc/cm²**	**log ufc/cm²**
0 h	14.000	4,15
24 h (B)	1.700.0000	6,23
REF 1: Producto con PERMABLOK3		
Tiempo de contacto / *Contact time*	**ufc/ cm²**	**log ufc/cm²**
24 h (C)	<20	1,28
Valor actividad antimicrobiana (R) / *Value of antimicrobial activity*	**R= log B/C**	**4,95**

Observaciones / *Notes:*

- Se ha utilizado como control, la propia placa petri. / *It has been used like control sample, the own petri plate.*

- Se considera que la muestra presenta actividad antibacteriana a partir de un valor de R ≥ 2. / *It is considered that the sample shows antibacterial activity from a value of R ≥ 2.*

RESULTADOS / *RESULTS*

ACTIVIDAD ANTIBACTERIANA /*ANTIBACTERIAL ACTIVITY*

Norma / *Standard*: ISO 22196:2011

Fecha ensayo / *Test date:* 30/06/2020 – 02/07/2020

Referencia muestra / *Sample reference:* REF 1: Producto con PERMABLOK3

Microorganismo utilizado/ *Test microorganism:* *Staphylococcus aureus MRSA ATCC 33591 (LMG 16217)*

Resultados / *Results:*

Staphylococcus aureus MRSA ATCC 33591 (LMG 16217)		
Inóculo / *Inoculum*	**ufc/ml**	**log ufc/ml**
	$3{,}1 \cdot 10^6$	6,49
Muestra control / *Control sample*		
Tiempo de contacto / *Contact time*	**ufc/cm²**	**log ufc/cm²**
0 h	9.400	3,97
24 h (B)	1.700.0000	7,26
REF 1: Producto con PERMABLOK3		
Tiempo de contacto / *Contact time*	**ufc/ cm²**	**log ufc/cm²**
24 h (C)	<20	1,28
Valor actividad antimicrobiana (R) / *Value of antimicrobial activity*	**R= log B/C**	**5,98**

Observaciones / *Notes:*

- Se ha utilizado como control, la propia placa petri. / *It has been used like control sample, the own petri plate.*

- Se considera que la muestra presenta actividad antibacteriana a partir de un valor de R ≥ 2. / *It is considered that the sample shows antibacterial activity from a value of R ≥ 2.*