

DR. F. H. H. BRILL · C/O DR. BRILL + PARTNER GMBH · STIEGSTÜCK 34 · DE-22339 HAMBURG

ROPIMEX R. OPEL GmbH  
Bildstocker Straße 12  
DE - 66538 Neunkirchen

Hamburg, 27 January 2022

## Expert opinion

### Bactericidal Activity of **Bacoban WBUS** in the quantitative suspension test according to DIN EN 1656:2019 (Phase 2, Step 1)

The disinfectant **Bacoban WBUS** was tested and evaluated according to DIN EN 1656:2019 "Chemical disinfectants and antiseptics - Quantitative suspension test for the evaluation of bactericidal activity of chemical disinfectants and antiseptics used in veterinary area - Test method and requirements (phase 2, step 1)".

According to the test report no. L21/01041.5 dated 27/01/2022 of Dr. Brill + Partner GmbH the preparation showed bactericidal activity under clean conditions at a test temperature of  $10^{\circ}\text{C} \pm 1^{\circ}\text{C}$ .

**Bacoban WBUS** complies with the requirements of DIN EN 1656:2019 (phase 2, step 1) with the following concentration-time relationship:

<b>Bactericidal:</b>	<b>clean conditions</b>	<b>0.5 %</b>	<b>30 minutes</b>
----------------------	-------------------------	--------------	-------------------



Dr. Florian H. H. Brill

Test report no L21/01041.5

Quantitative suspension test for the evaluation of bactericidal activity of **Bacoban WBUS**  
in the veterinary area (DIN EN 1656:2019; Phase 2, Step 1\*)

In accordance with your order, we tested the preparation **Bacoban WBUS** for its activity in the quantitative suspension test according to DIN EN 1656:2019\* under clean conditions.

**1 General Information and Material**

1.1 Client

Client: ROPI-MEX R. OPEL GmbH, Mrs Jennifer Sahl, Bildstocker Straße 12,  
DE - 66538 Neunkirchen, Germany  
Date of order: 23/12/2021  
Confirmation no.: 226415

1.2 Identification of Test Laboratory

Location: Dr. Brill + Partner GmbH · Institute for Hygiene and Microbiology,  
Stiegstück 34, DE-22339 Hamburg, Germany  
Study manager: Dipl.-Ing. Dr. rer. nat. Andreas Kampe  
Scientific assistant: Dipl.-Biol. Henrik Gabriel  
Laboratory technicians: Elahe Saroukhani

1.3 Table of Contents

General Information and Material	1
Methods	3
Results	3
Tables	4
List of Abbreviations	8

1.4 Identification of Sample

Name of product: **Bacoban WBUS**  
Batch no.: 20210920\_Bacoban WBUS\_imi

\* Test procedure accredited according to DIN EN ISO/IEC 17025. Test report issued by Dr. Brill + Partner GmbH, Stiegstück 34, DE - 22339 Hamburg, Phone +49 40 557631-0, Telefax +49 40 557631-11, [www.brillhygiene.com](http://www.brillhygiene.com). No copying or transmission, in whole or in part, of this test report without the explicit prior written permission. The test results exclusively apply to the tested samples. Information on measurement uncertainty and Version history on request. © Dr. Brill + Partner GmbH 2022



Internal no.:	21/01202
Manufacturer:	ROPIMEX R. OPEL GmbH, DE - 66538 Neunkirchen, Germany
Date of delivery:	21/09/2021
Storage conditions:	room temperature and darkness
Appearance of product:	clear liquid
Odour:	characteristic
Product type:	surface disinfectant
Recommended diluent:	Tap water
Diluent used:	water of standardised hardness (WSH, pH 7.0)
pH value, concentrate:	4.3
pH value, 1.0 % (measured in WSH):	6.2
pH value, 0.5 % (measured in WSH):	6.6
pH value, 0.1 % (measured in WSH):	7.0
Active agents (Manufacturer's data):	33.31 g benzalkoniumchloride

#### 1.5 Test Conditions

Test period:	04/01/ - 07/01/2022
Lab task no.:	L21/01041.5
Product test concentrations:	0.1 + 0.5 + 1.0 %
Exposure time:	30 minutes
Test temperature:	10°C ± 1°C
Incubation temperature:	36°C ± 1°C
Organic load:	clean conditions (3.0 g/L bovine albumin)
Neutraliser:	60 g/L polysorbate 80, 60 g/L saponine, 8 g/L lecithin, 1 g/L cysteine, 2.5 g/L SDS (TLSC-SDS)
Test organisms:	<i>Staphylococcus aureus</i> ATCC 6538 <i>Enterococcus hirae</i> ATCC 10541 <i>Proteus hauseri (vulgaris)</i> ATCC 13315 <i>Pseudomonas aeruginosa</i> ATCC 15442

\* Test procedure accredited according to DIN EN ISO/IEC 17025. Test report issued by Dr. Brill + Partner GmbH, Stiegstück 34, DE - 22339 Hamburg, Phone +49 40 557631-0, Telefax +49 40 557631-11, [www.brillhygiene.com](http://www.brillhygiene.com). No copying or transmission, in whole or in part, of this test report without the explicit prior written permission. The test results exclusively apply to the tested samples. Information on measurement uncertainty and Version history on request. © Dr. Brill + Partner GmbH 2022



## 2 Methods

The tests were carried out according to DIN EN 1656:2019 "Chemical disinfectants and antiseptics - Quantitative suspension test for the evaluation of bactericidal activity of chemical disinfectants and antiseptics used in veterinary area - Test method and requirements (phase 2, step 1)".

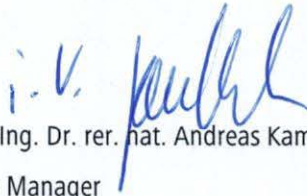
## 3 Results


The test results based on DIN EN 1656:2019 are summarised in tables 1.

The test bacteria were sufficiently (RF >5) inactivated with the following concentration-time relationship:

Bactericidal:                                      clean conditions                                      0.5 %                                      30 minutes

Hamburg, 27/01/2022

  
Dipl.-Ing. Dr. rer. nat. Andreas Kampe  
Study Manager

  
Dipl.-Biol. Henrik Gabriel  
Head of Laboratory



\* Test procedure accredited according to DIN EN ISO/IEC 17025. Test report issued by Dr. Brill + Partner GmbH, Stiegstück 34, DE - 22339 Hamburg, Phone +49 40 557631-0, Telefax +49 40 557631-11, www.brillhygiene.com. No copying or transmission, in whole or in part, of this test report without the explicit prior written permission. The test results exclusively apply to the tested samples. Information on measurement uncertainty and Version history on request. © Dr. Brill + Partner GmbH 2022



Table 1.1: Validation, Controls and Evaluation

Product name: **Bacoban WBUS** Batch: 20210920\_Bacoban  
WBUS\_imi  
Test organism: *Staphylococcus aureus* Temperature: 10°C ± 1°C  
Organic load: clean conditions Neutraliser: TLSC-SDS

Suspension for validation (N <sub>v0</sub> )			Control of test conditions (A)						
			5 minutes		30 minutes		n.t.		
Microbial count	∑		Microbial count	∑	Microbial count	∑	Microbial count	∑	
V <sub>c1</sub>	113	116,5	V <sub>c1</sub>		V <sub>c1</sub>	117	120,5	V <sub>c1</sub>	
V <sub>c2</sub>	120		V <sub>c2</sub>		V <sub>c2</sub>	124		V <sub>c2</sub>	
30 ≤ ∑ of N <sub>v0</sub> ≤ 160		<b>Yes</b>	∑ of A(5') is ≥ 0,5 x ∑ of N <sub>v0</sub> ?		∑ of A(30') is ≥ 0,5 x ∑ of N <sub>v0</sub> ?		<b>Yes</b>	∑ of A(60') is ≥ 0,5 x ∑ of N <sub>v0</sub> ?	
Control of neutraliser (B)			Validation of method (C) at highest product concentration: 1,0 %						
			5 minutes		30 minutes		n.t.		
Microbial count	∑		Microbial count	∑	Microbial count	∑	Microbial count	∑	
V <sub>c1</sub>	109	113	V <sub>c1</sub>		V <sub>c1</sub>	101	103	V <sub>c1</sub>	
V <sub>c2</sub>	117		V <sub>c2</sub>		V <sub>c2</sub>	105		V <sub>c2</sub>	
∑ of B is ≥ 0,5 x ∑ of N <sub>v0</sub> ?		<b>Yes</b>	∑ of C(5') is ≥ 0,5 x ∑ of N <sub>v0</sub> ?		∑ of C(30') is ≥ 0,5 x ∑ of N <sub>v0</sub> ?		<b>Yes</b>	∑ of C(60') is ≥ 0,5 x ∑ of N <sub>v0</sub> ?	

Test suspension (N and N <sub>0</sub> )	N	Microbial count of plates		V <sub>c1</sub>	V <sub>c2</sub>	∑ <sub>wm</sub> / lg N	N <sub>0</sub> =N/10; lg N <sub>0</sub>	7,17 ≤ N <sub>0</sub> ≤ 7,70 ?
	1,00E-06	>330	>330	>330	>330	4,40E+08	7,64	<b>Yes</b>
	1,00E-07	44	44	44	44	8,64		
Product concentration [%]	Exposure time [min]	Microbial count of plates		V <sub>c1</sub>	V <sub>c2</sub>	N <sub>a</sub> = ∑ x 10	lg N <sub>a</sub>	lg R (lg N <sub>0</sub> = 7,64)
0,10	30	0	0	<14	<14	<140	<2,15	≥ 5,49
0,50	30	0	0	<14	<14	<140	<2,15	≥ 5,49
1,00	30	0	0	<14	<14	<140	<2,15	≥ 5,49

\* Test procedure accredited according to DIN EN ISO/IEC 17025. Test report issued by Dr. Brill + Partner GmbH, Stiegstück 34, DE - 22339 Hamburg, Phone +49 40 557631-0, Telefax +49 40 557631-11, www.brillhygiene.com. No copying or transmission, in whole or in part, of this test report without the explicit prior written permission. The test results exclusively apply to the tested samples. Information on measurement uncertainty and Version history on request. © Dr. Brill + Partner GmbH 2022



Table 1.2: Validation, Controls and Evaluation

Product name: **Bacoban WBUS** Batch: 20210920\_Bacoban  
WBUS\_imi  
Test organism: *Enterococcus hirae* Temperature: 10°C ± 1°C  
Organic load: clean conditions Neutraliser: TLSC-SDS

Suspension for validation (N <sub>v0</sub> )				Control of test conditions (A)											
				5 minutes				30 minutes				n.t.			
Microbial count		x̄		Microbial count		x̄		Microbial count		x̄		Microbial count		x̄	
V <sub>c1</sub>	84		86,5	V <sub>c1</sub>			81,5	V <sub>c1</sub>	80		81,5	V <sub>c1</sub>			
V <sub>c2</sub>	89			V <sub>c2</sub>				V <sub>c2</sub>	83			V <sub>c2</sub>			
30 ≤ x̄ of N <sub>v0</sub> ≤ 160				<b>Yes</b>				x̄ of A(5') is ≥ 0,5 x x̄ of N <sub>v0</sub> ?				<b>Yes</b>			
				x̄ of A(30') is ≥ 0,5 x x̄ of N <sub>v0</sub> ?								x̄ of A(60') is ≥ 0,5 x x̄ of N <sub>v0</sub> ?			
Control of neutraliser (B)				Validation of method (C) at highest product concentration: 1,0 %											
				5 minutes				30 minutes				n.t.			
Microbial count		x̄		Microbial count		x̄		Microbial count		x̄		Microbial count		x̄	
V <sub>c1</sub>	79		88	V <sub>c1</sub>			79,5	V <sub>c1</sub>	77		79,5	V <sub>c1</sub>			
V <sub>c2</sub>	97			V <sub>c2</sub>				V <sub>c2</sub>	82			V <sub>c2</sub>			
x̄ of B is ≥ 0,5 x x̄ of N <sub>v0</sub> ?				<b>Yes</b>				x̄ of C(5') is ≥ 0,5 x x̄ of N <sub>v0</sub> ?				<b>Yes</b>			
				x̄ of C(30') is ≥ 0,5 x x̄ of N <sub>v0</sub> ?								x̄ of C(60') is ≥ 0,5 x x̄ of N <sub>v0</sub> ?			

Test suspension (N and N <sub>0</sub> )	N	Microbial count of plates		V <sub>c1</sub>	V <sub>c2</sub>	x̄ <sub>wm</sub> / lg N	N <sub>0</sub> =N/10; lg N <sub>0</sub>	7,17 ≤ N <sub>0</sub> ≤ 7,70 ?
	1,00E-06	>330	>330	>330	>330	3,30E+08	7,52	<b>Yes</b>
	1,00E-07	29	37	29	37	8,52		

Product concentration [%]	Exposure time [min]	Microbial count of plates		V <sub>c1</sub>	V <sub>c2</sub>	N <sub>a</sub> = x̄ x 10	lg N <sub>a</sub>	lg R
								(lg N <sub>0</sub> = 7,52)
0,10	30	0	0	<14	<14	<140	<2,15	≥ 5,37
0,50	30	0	0	<14	<14	<140	<2,15	≥ 5,37
1,00	30	0	0	<14	<14	<140	<2,15	≥ 5,37

\* Test procedure accredited according to DIN EN ISO/IEC 17025. Test report issued by Dr. Brill + Partner GmbH, Stiegstück 34, DE - 22339 Hamburg, Phone +49 40 557631-0, Telefax +49 40 557631-11, www.brillhygiene.com. No copying or transmission, in whole or in part, of this test report without the explicit prior written permission. The test results exclusively apply to the tested samples. Information on measurement uncertainty and Version history on request. © Dr. Brill + Partner GmbH 2022



Table 1.3: Validation, Controls and Evaluation

Product name: **Bacoban WBUS** Batch: 20210920\_Bacoban  
WBUS\_imi  
Test organism: *Proteus hauseri* Temperature: 10°C ± 1°C  
Organic load: clean conditions Neutraliser: TLSC-SDS

Suspension for validation (N <sub>v0</sub> )			Control of test conditions (A)											
			5 minutes				30 minutes				n.t.			
Microbial count		̄	Microbial count		̄	Microbial count		̄	Microbial count		̄	Microbial count		̄
V <sub>c1</sub>	103	110	V <sub>c1</sub>		92	V <sub>c1</sub>	84	92	V <sub>c1</sub>			V <sub>c1</sub>		
V <sub>c2</sub>	117		V <sub>c2</sub>			V <sub>c2</sub>	100		V <sub>c2</sub>					
30 ≤ ̄ of N <sub>v0</sub> ≤ 160		<b>Yes</b>	̄ of A(5') is ≥ 0,5 x ̄ of N <sub>v0</sub> ?				̄ of A(30') is ≥ 0,5 x ̄ of N <sub>v0</sub> ?				<b>Yes</b> ̄ of A(60') is ≥ 0,5 x ̄ of N <sub>v0</sub> ?			
Control of neutraliser (B)			Validation of method (C) at highest product concentration: 1,0 %											
			5 minutes				30 minutes				n.t.			
Microbial count		̄	Microbial count		̄	Microbial count		̄	Microbial count		̄	Microbial count		̄
V <sub>c1</sub>	95	95,5	V <sub>c1</sub>		93	V <sub>c1</sub>	89	93	V <sub>c1</sub>			V <sub>c1</sub>		
V <sub>c2</sub>	96		V <sub>c2</sub>			V <sub>c2</sub>	97		V <sub>c2</sub>					
̄ of B is ≥ 0,5 x ̄ of N <sub>v0</sub> ?		<b>Yes</b>	̄ of C(5') is ≥ 0,5 x ̄ of N <sub>v0</sub> ?				̄ of C(30') is ≥ 0,5 x ̄ of N <sub>v0</sub> ?				<b>Yes</b> ̄ of C(60') is ≥ 0,5 x ̄ of N <sub>v0</sub> ?			
Test suspension (N and N <sub>0</sub> )		N	Microbial count of plates			V <sub>c1</sub>	V <sub>c2</sub>	̄ <sub>wm</sub> / lg N	N <sub>0</sub> =N/10; lg N <sub>0</sub>	7,17 ≤ N <sub>0</sub> ≤ 7,70 ?				
		1,00E-06	>330		>330	>330	>330	4,70E+08	7,67	<b>Yes</b>				
		1,00E-07	46		48	46	48	8,67						
Product concentration [%]		Exposure time [min]	Microbial count of plates			V <sub>c1</sub>	V <sub>c2</sub>	N <sub>a</sub> = ̄ x 10	lg N <sub>a</sub>	lg R (lg N <sub>0</sub> = 7,67)				
0,10		30	0		0	<14	<14	<140	<2,15	≥ 5,52				
0,50		30	0		0	<14	<14	<140	<2,15	≥ 5,52				
1,00		30	0		0	<14	<14	<140	<2,15	≥ 5,52				

\* Test procedure accredited according to DIN EN ISO/IEC 17025. Test report issued by Dr. Brill + Partner GmbH, Stiegstück 34, DE - 22339 Hamburg, Phone +49 40 557631-0, Telefax +49 40 557631-11, www.brillhygiene.com. No copying or transmission, in whole or in part, of this test report without the explicit prior written permission. The test results exclusively apply to the tested samples. Information on measurement uncertainty and Version history on request. © Dr. Brill + Partner GmbH 2022



Table 1.4: Validation, Controls and Evaluation

Product name: **Bacoban WBUS** Batch: 20210920\_Bacoban  
Test organism: *Pseudomonas aeruginosa* WBUS\_imi  
Organic load: clean conditions Temperature: 10°C ± 1°C  
Neutraliser: TLSC-SDS

Suspension for validation (N <sub>v0</sub> )			Control of test conditions (A)						
			5 minutes		30 minutes		n.t.		
Microbial count	x̄		Microbial count	x̄	Microbial count	x̄	Microbial count	x̄	
V <sub>c1</sub>	85	85	V <sub>c1</sub>		V <sub>c1</sub>	83	87,5	V <sub>c1</sub>	
V <sub>c2</sub>	85		V <sub>c2</sub>		V <sub>c2</sub>	92		V <sub>c2</sub>	
30 ≤ x̄ of N <sub>v0</sub> ≤ 160		<b>Yes</b>	x̄ of A(5') is ≥ 0,5 x x̄ of N <sub>v0</sub> ?		x̄ of A(30') is ≥ 0,5 x x̄ of N <sub>v0</sub> ?		<b>Yes</b>	x̄ of A(60') is ≥ 0,5 x x̄ of N <sub>v0</sub> ?	
Control of neutraliser (B)			Validation of method (C) at highest product concentration: 1,0 %						
			5 minutes		30 minutes		n.t.		
Microbial count	x̄		Microbial count	x̄	Microbial count	x̄	Microbial count	x̄	
V <sub>c1</sub>	84	89,5	V <sub>c1</sub>		V <sub>c1</sub>	92	92,5	V <sub>c1</sub>	
V <sub>c2</sub>	95		V <sub>c2</sub>		V <sub>c2</sub>	93		V <sub>c2</sub>	
x̄ of B is ≥ 0,5 x x̄ of N <sub>v0</sub> ?		<b>Yes</b>	x̄ of C(5') is ≥ 0,5 x x̄ of N <sub>v0</sub> ?		x̄ of C(30') is ≥ 0,5 x x̄ of N <sub>v0</sub> ?		<b>Yes</b>	x̄ of C(60') is ≥ 0,5 x x̄ of N <sub>v0</sub> ?	

Test suspension (N and N <sub>0</sub> )	N	Microbial count of plates		V <sub>c1</sub>	V <sub>c2</sub>	x̄ <sub>wm</sub> / lg N	N <sub>0</sub> =N/10; lg N <sub>0</sub>	7,17 ≤ N <sub>0</sub> ≤ 7,70 ?
	1,00E-06	>330	>330	>330	>330	4,60E+08	7,66	<b>Yes</b>
	1,00E-07	43	49	43	49	8,66		
Product concentration [%]	Exposure time [min]	Microbial count of plates		V <sub>c1</sub>	V <sub>c2</sub>	N <sub>a</sub> = x̄ x 10	lg N <sub>a</sub>	lg R (lg N <sub>0</sub> = 7,66)
0,10	30	>330	>330	>330	>330	>3300	>3,52	≤ 4,14
0,50	30	20	21	20	21	205	2,31	5,35
1,00	30	0	0	<14	<14	<140	<2,15	≥ 5,51

\* Test procedure accredited according to DIN EN ISO/IEC 17025. Test report issued by Dr. Brill + Partner GmbH, Stiegstück 34, DE - 22339 Hamburg, Phone +49 40 557631-0, Telefax +49 40 557631-11, www.brillhygiene.com. No copying or transmission, in whole or in part, of this test report without the explicit prior written permission. The test results exclusively apply to the tested samples. Information on measurement uncertainty and Version history on request. © Dr. Brill + Partner GmbH 2022





#### 4 List of Abbreviations

A	=	control of test conditions
B	=	control of neutraliser
C	=	validation of method at highest product concentration
N	=	test suspension
N <sub>vo</sub>	=	suspension for validation
n.t.	=	not tested
N <sub>0</sub>	=	microbial count of test suspension N / 10 (microbial count at time index 0)
R	=	germ reduction in log <sub>10</sub> -steps
V <sub>c</sub>	=	viable microbial count per ml
$\bar{x}$	=	weighted mean of N

\* Test procedure accredited according to DIN EN ISO/IEC 17025. Test report issued by Dr. Brill + Partner GmbH, Stiegstück 34, DE - 22339 Hamburg, Phone +49 40 557631-0, Telefax +49 40 557631-11, [www.brillhygiene.com](http://www.brillhygiene.com). No copying or transmission, in whole or in part, of this test report without the explicit prior written permission. The test results exclusively apply to the tested samples. Information on measurement uncertainty and Version history on request. © Dr. Brill + Partner GmbH 2022

DR. F. H. H. BRILL · C/O DR. BRILL + PARTNER GMBH · STIEGSTÜCK 34 · DE-22339 HAMBURG

ROPIMEX R. OPEL GmbH  
Bildstocker Straße 12  
DE - 66538 Neunkirchen

Hamburg, 27 January 2022

## Expert opinion

### Yeasticidal Activity of **Bacoban WBUS** in the quantitative suspension test according to DIN EN 1657:2016 (Phase 2, Step 1)

The disinfectant **Bacoban WBUS** was tested and evaluated according to DIN EN 1657:2016 "Chemical disinfectants and antiseptics - Quantitative suspension test for the evaluation of fungicidal or yeasticidal activity of chemical disinfectants and antiseptics used in veterinary area - Test method and requirements (phase 2, step 1)".

According to the test report no. L21/01041.7 dated 27/01/2022 of Dr. Brill + Partner GmbH the preparation showed yeasticidal activity under clean conditions at a test temperature of  $10^{\circ}\text{C} \pm 1^{\circ}\text{C}$ .

**Bacoban WBUS** complies with the requirements of DIN EN 1657:2016 (phase 2, step 1) with the following concentration-time relationship:

<b>Yeasticidal:</b>	<b>clean conditions</b>	<b>0.5 %</b>	<b>30 minutes</b>
---------------------	-------------------------	--------------	-------------------



Dr. Florian H. H. Brill



## Test report no L21/01041.7

### Quantitative suspension test for the evaluation of fungicidal or yeasticidal activity of **Bacoban WBUS** in veterinary area according to DIN EN 1657:2016 (Phase 2, step 1)\*

In accordance with your order, we tested the preparation **Bacoban WBUS** for its activity in the quantitative suspension test according to DIN EN 1657:2016\* under clean conditions.

#### 1 General Information and Material

##### 1.1 Client

Client: ROPIMEX R. OPEL GmbH, Mrs Jennifer Sahl, Bildstocker Straße 12,  
DE - 66538 Neunkirchen, Germany  
Date of order: 23/12/2021  
Confirmation no.: 226415

##### 1.2 Identification of Test Laboratory

Location: Dr. Brill + Partner GmbH · Institute for Hygiene and Microbiology,  
Stiegstück 34, DE-22339 Hamburg, Germany  
Study manager: Dipl.-Ing. Dr. rer. nat. Andreas Kampe  
Scientific assistant: Dipl.-Biol. Henrik Gabriel  
Laboratory technicians: Elahe Saroukhani

##### 1.3 Table of Contents

General Information and Material	1
Methods	2
Results	3
Tables	4
List of Abbreviations	5

##### 1.4 Identification of Sample

Name of product: **Bacoban WBUS**  
Batch no.: 20210920\_Bacoban WBUS\_imi

\* Test procedure accredited according to DIN EN ISO/IEC 17025. Test report issued by Dr. Brill + Partner GmbH, Stiegstück 34, DE - 22339 Hamburg, Phone +49 40 557631-0, Telefax +49 40 557631-11, www.brillhygiene.com. No copying or transmission, in whole or in part, of this test report without the explicit prior written permission. The test results exclusively apply to the tested samples. Information on measurement uncertainty and Version history on request. © Dr. Brill + Partner GmbH 2022



Internal no.:	21/01202
Manufacturer:	ROPIMEX R. OPEL GmbH, DE - 66538 Neunkirchen, Germany
Date of delivery:	21/09/2021
Storage conditions:	room temperature and darkness
Appearance of product:	clear liquid
Odour:	characteristic
Product type:	surface disinfectant
Recommended diluent:	Tap water
Diluent used:	water of standardised hardness (WSH, pH 7.0)
pH value, concentrate:	4.3
pH value, 1.0 % (measured in WSH):	6.2
pH value, 0.5 % (measured in WSH):	6.5
pH value, 0.1 % (measured in WSH):	7.0
Active agents (Manufacturer's data):	33.31 g benzalkoniumchloride

#### 1.5 Test Conditions

Test period:	13/01/ - 17/01/2022
Lab task no.:	L21/01041.7
Product test concentrations:	0.1 + 0.5 + 1.0 %
Exposure time:	30 minutes
Test temperature:	10°C ± 1°C
Incubation temperature:	30°C ± 1°C
Organic load:	clean conditions (3.0 g/L bovine albumin)
Neutraliser:	60 g/L polysorbate 80, 60 g/L saponine, 8 g/L lecithin, 1 g/L cysteine, 2.5 g/L SDS (TLSC-SDS)
Test organisms:	<i>Candida albicans</i> ATCC 10231

## 2 Methods

The tests were carried out according to DIN EN 1657:2016 "Chemical disinfectants and antiseptics - Quantitative suspension test for the evaluation of fungicidal or yeasticidal activity of chemical disinfectants and antiseptics used in veterinary area - Test method and requirements (phase 2, step 1)".

\* Test procedure accredited according to DIN EN ISO/IEC 17025. Test report issued by Dr. Brill + Partner GmbH, Stiegstück 34, DE - 22339 Hamburg, Phone +49 40 557631-0, Telefax +49 40 557631-11, www.brillhygiene.com. No copying or transmission, in whole or in part, of this test report without the explicit prior written permission. The test results exclusively apply to the tested samples. Information on measurement uncertainty and Version history on request. © Dr. Brill + Partner GmbH 2022



### 3 Results

The test results based on DIN EN 1657: 2016 are summarised in tables 1 and 2.

The test yeast was sufficiently (RF >4) inactivated with the following concentration-time relationship:

Yeasticidal:                                      clean conditions                                      0.5 %                                      30 minutes

Hamburg, 27/01/2022

  
i-v. feuchel

Dipl.-Ing. Dr. rer. nat. Andreas Kampe  
Study Manager

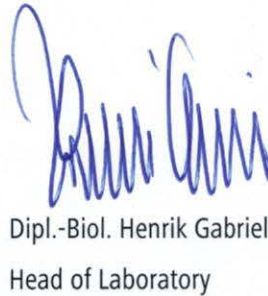
  
Dipl.-Biol. Henrik Gabriel  
Head of Laboratory





Table 1: Validation, Controls and Evaluation

Product name: **Bacoban WBUS**  
Test organism: *Candida albicans*  
Organic load: clean conditions  
Contact time: **30 minutes**

Batch: 20210920\_Bacoban  
WBUS\_imi  
Temperature: 10°C ± 1°C  
Neutraliser: TLSC-SDS

Suspension for Validation ( $N_{v0}$ )			Control of test conditions (A)								
			n.t.		30 minutes				n.t.		
	Microbial count	$\bar{x}$		Microbial count	$\bar{x}$		Microbial count	$\bar{x}$		Microbial count	$\bar{x}$
$V_{c1}$	31	34,5	$V_{c1}$			$V_{c1}$	29		31	$V_{c1}$	
$V_{c2}$	38		$V_{c2}$			$V_{c2}$	33			$V_{c2}$	
$30 \leq \bar{x} \text{ of } N_{v0} \leq 160$		<b>Yes</b>	$\bar{x} \text{ of } A(15') \text{ is } \geq 0,5 \times \bar{x} \text{ of } N_{v0}?$			$\bar{x} \text{ of } A(30') \text{ is } \geq 0,5 \times \bar{x} \text{ of } N_{v0}?$			<b>Ja</b>	$\bar{x} \text{ of } A(') \text{ is } \geq 0,5 \times \bar{x} \text{ of } N_{v0}?$	
Control of neutralizer (B)			Validation (C) of method at highest product concentration: 1,00 %								
			n.t.		30 minutes				n.t.		
	Microbial count	$\bar{x}$		Microbial count	$\bar{x}$		Microbial count	$\bar{x}$		Microbial count	$\bar{x}$
$V_{c1}$	28	31,5	$V_{c1}$			$V_{c1}$	24		28,5	$V_{c1}$	
$V_{c2}$	35		$V_{c2}$			$V_{c2}$	33			$V_{c2}$	
$\bar{x} \text{ of } B \text{ is } \geq 0,5 \times \bar{x} \text{ of } N_{v0}?$		<b>Yes</b>	$\bar{x} \text{ of } C(15') \text{ is } \geq 0,5 \times \bar{x} \text{ of } N_{v0}?$			$\bar{x} \text{ of } C(30') \text{ is } \geq 0,5 \times \bar{x} \text{ of } N_{v0}?$			<b>Ja</b>	$\bar{x} \text{ of } C(') \text{ is } \geq 0,5 \times \bar{x} \text{ of } N_{v0}?$	
Test suspension (N and $N_0$ )	N	Microbial count of plates				$V_{c1}$	$V_{c2}$	$\bar{x}_{wm} / \lg N$	$N_0 = N/10; \lg N_0$	$6,17 \leq N_0 \leq 6,70 ?$	
	1,00E-05	>330		>330		>660	>660	2,00E+07	6,30	<b>Yes</b>	
	1,00E-06	17		23		17	23	7,30			
Product concentration [%]	Exposure time [min]	Microbial count of plates				$V_{c1}$	$V_{c2}$	$N_a = \bar{x} \times 10$	$\lg N_a$	$\lg R$ ( $\lg N_0 = 6,30$ )	
	0,10	30	>330		>330		>330	>330	>3300	>3,52	$\leq 2,78$
	0,50	30	0		0		<14	<14	<140	<2,15	$\geq 4,15$
	1,00	30	0		0		<14	<14	<140	<2,15	$\geq 4,15$

\* Test procedure accredited according to DIN EN ISO/IEC 17025. Test report issued by Dr. Brill + Partner GmbH, Stiegstück 34, DE - 22339 Hamburg, Phone +49 40 557631-0, Telefax +49 40 557631-11, www.brillhygiene.com. No copying or transmission, in whole or in part, of this test report without the explicit prior written permission. The test results exclusively apply to the tested samples. Information on measurement uncertainty and Version history on request. © Dr. Brill + Partner GmbH 2022



#### 4 List of Abbreviations

A	=	control of test conditions
B	=	control of neutraliser
C	=	validation of method at highest product concentration
N	=	test suspension
N <sub>vo</sub>	=	suspension for validation
n.t.	=	not tested
N <sub>0</sub>	=	microbial count of test suspension N / 10 (microbial count at time index 0)
R	=	germ reduction in log <sub>10</sub> -steps
V <sub>c</sub>	=	viable microbial count per ml
$\bar{x}$	=	weighted mean of N

\* Test procedure accredited according to DIN EN ISO/IEC 17025. Test report issued by Dr. Brill + Partner GmbH, Stiegstück 34, DE - 22339 Hamburg, Phone +49 40 557631-0, Telefax +49 40 557631-11, www.brillhygiene.com. No copying or transmission, in whole or in part, of this test report without the explicit prior written permission. The test results exclusively apply to the tested samples. Information on measurement uncertainty and Version history on request. © Dr. Brill + Partner GmbH 2022

ROPIMEX R. OPEL GmbH  
Bildstocker Straße 12  
DE - 66538 Neunkirchen

Hamburg, 27 January 2022

## Expert opinion

### Bactericidal Activity of **Bacoban WBUS** in the quantitative surface test according to DIN EN 14349:2013 (Phase 2, Step 2)

The disinfectant **Bacoban WBUS** was tested and evaluated according to DIN EN 14349:2013 "Chemical disinfectants and antiseptics - Quantitative surface test for the evaluation of bactericidal activity of chemical disinfectants and antiseptics used in veterinary area on non-porous surfaces without mechanical action - Test method and requirements (phase 2, step 2)".

According to the test report no. L21/01041.6 dated 27/01/2022 of Dr. Brill + Partner GmbH the preparation showed bactericidal activity under clean conditions at a test temperature of 10°C ± 1°C.

**Bacoban WBUS** complies with the requirements of DIN EN 14349:2013 (phase 2, step 2) with the following concentration-time relationship:

<b>Bactericidal:</b>	<b>clean conditions</b>	<b>1.0 %</b>	<b>30 minutes</b>
----------------------	-------------------------	--------------	-------------------

  
Dr. Florian H. H. Brill





## Test report no L21/01041.6

### Quantitative surface test for the evaluation of bactericidal activity of **Bacoban WBUS** in the veterinary area (DIN EN 14349:2013; Phase 2, Step 2\*)

In accordance with your order, we tested the preparation **Bacoban WBUS** for its activity in the quantitative surface test according to DIN EN 14349:2013\* under clean conditions.

#### 1 General Information and Material

##### 1.1 Client

Client: ROPILEX R. OPEL GmbH, Mrs Jennifer Sahl, Bildstocker Straße 12,  
DE - 66538 Neunkirchen, Germany  
Date of order: 23/12/2021  
Confirmation no.: 226415

##### 1.2 Identification of Test Laboratory

Location: Dr. Brill + Partner GmbH · Institute for Hygiene and Microbiology,  
Stiegstück 34, DE-22339 Hamburg, Germany  
Study manager: Dipl.-Biol. Dr. rer. nat. Jan-Hendrik Klock  
Scientific assistant: Dipl.-Biol. Henrik Gabriel  
Laboratory technicians: Elahe Saroukhani

##### 1.3 Table of Contents

General Information and Material	1
Methods	3
Results	3
Tables	4
List of Abbreviations	8

##### 1.4 Identification of Sample

Name of product: **Bacoban WBUS**  
Batch no.: 20210920\_Bacoban WBUS\_imi

\* Test procedure accredited according to DIN EN ISO/IEC 17025. Test report issued by Dr. Brill + Partner GmbH, Stiegstück 34, DE - 22339 Hamburg, Phone +49 40 557631-0, Telefax +49 40 557631-11, www.brillhygiene.com. No copying or transmission, in whole or in part, of this test report without the explicit prior written permission. The test results exclusively apply to the tested samples. Information on measurement uncertainty and Version history on request. © Dr. Brill + Partner GmbH 2022



Internal no.:	21/01202
Manufacturer:	ROPIMEX R. OPEL GmbH, DE - 66538 Neunkirchen, Germany
Date of delivery:	21/09/2021
Storage conditions:	room temperature and darkness
Appearance of product:	clear liquid
Odour:	characteristic
Product type:	surface disinfectant
Recommended diluent:	Tap water
Diluent used:	water of standardised hardness (WSH, pH 7.0)
pH value, concentrate:	4.3
pH value, 1.0 % (measured in WSH):	6.3
pH value, 0.5 % (measured in WSH):	6.9
pH value, 0.1 % (measured in WSH):	7.4
Active agents (Manufacturer's data):	33.31 g benzalkoniumchloride

#### 1.5 Test Conditions

Test period:	26/10/ - 28/10/2021, 30/12/2021 - 03/01/2022	
Lab task no.:	L21/01041.2+.6	
Test pieces:	stainless steel	
Drying time:	<60 minutes (22.5 min ± 2.5 min)	
Product test concentrations:	0.1 + 0.5 + 1.0 %	
Exposure time:	30 minutes	
Test temperature:	10°C ± 1°C	
Relative humidity:	45 % ± 5 %	
Incubation temperature:	36°C ± 1°C	
Organic load:	clean conditions (3.0 g/L bovine albumin)	
Neutraliser:	60 g/L polysorbate 80, 60 g/L saponine, 8 g/L lecithin, 1 g/L cysteine, 2.5 g/L SDS (TLSC-SDS)	
Test organisms:	<i>Staphylococcus aureus</i>	ATCC 6538
	<i>Enterococcus hirae</i>	ATCC 10541
	<i>Proteus hauseri (vulgaris)</i>	ATCC 13315
	<i>Pseudomonas aeruginosa</i>	ATCC 15442

\* Test procedure accredited according to DIN EN ISO/IEC 17025. Test report issued by Dr. Brill + Partner GmbH, Stiegstück 34, DE - 22339 Hamburg, Phone +49 40 557631-0, Telefax +49 40 557631-11, www.brillhygiene.com. No copying or transmission, in whole or in part, of this test report without the explicit prior written permission. The test results exclusively apply to the tested samples. Information on measurement uncertainty and Version history on request. © Dr. Brill + Partner GmbH 2022



## 2 Methods

The tests were carried out according to DIN EN 14349:2013 "Chemical disinfectants and antiseptics - Quantitative surface test for the evaluation of bactericidal activity of chemical disinfectants and antiseptics used in veterinary area on non-porous surfaces without mechanical action - Test method and requirements (phase 2, step 2)".

## 3 Results

The test results based on DIN EN 14349: 2013 are summarised in tables 1.

The test bacteria were sufficiently (RF >4) inactivated with the following concentration-time relationship:

Bactericidal:                                      clean conditions                                      1.0 %                                      30 minutes

Hamburg, 27/01/2022

Dipl.-Biol. Dr. rer. nat. Jan-Hendrik Klock  
Study Manager

Dipl.-Biol. Henrik Gabriel  
Head of Laboratory



\* Test procedure accredited according to DIN EN ISO/IEC 17025. Test report issued by Dr. Brill + Partner GmbH, Stiegstück 34, DE - 22339 Hamburg, Phone +49 40 557631-0, Telefax +49 40 557631-11, www.brillhygiene.com. No copying or transmission, in whole or in part, of this test report without the explicit prior written permission. The test results exclusively apply to the tested samples. Information on measurement uncertainty and Version history on request. © Dr. Brill + Partner GmbH 2022



Table 1.1: Validation, Controls and Evaluation

Product name: **Bacoban WBUS** Batch: 20210920\_Bacoban  
WBUS\_imi  
Test organism: *Staphylococcus aureus* Temperature: 10°C ± 1°C  
Organic load: clean conditions Neutraliser: TLSC-SDS  
Contact time: **30 minutes** Test surface: stainless steel

Test and validation suspension ( <i>N</i> )				Control concerning toxicity of neutraliser ( <i>B</i> )				Control of neutralisation ( <i>C</i> ) At concentration: 1,0 %			
Dilution	V <sub>c1</sub>	V <sub>c2</sub>	Σ	Dilution	V <sub>c1</sub>	V <sub>c2</sub>	Σ	Dilution	V <sub>c1</sub>	V <sub>c2</sub>	Σ
1,00E-07	>330	>330	92	1,00E-04	>330	>330	60	1,00E-04	>330	>330	78
1,00E-08	42	50		1,00E-05	28	32		1,00E-05	41	37	
$\bar{x}_{xm} = 1,15E+08 = 8,061$				$\bar{x} = 3,00E+07 = 7,477$				$\bar{x} = 3,90E+07 = 7,591$			
7,57 ≤ lg <i>N</i> ≤ 8,10 ?			<b>Yes</b>	x̄ of <i>B</i> ≥ 0,5 x x̄ von <i>N<sub>w</sub></i> ?			<b>Yes</b>	x̄ of <i>C</i> ≥ 0,5 x x̄ von <i>N<sub>w</sub></i> ?			<b>Yes</b>

Water control ( <i>N<sub>w</sub></i> )	<i>N<sub>w</sub></i>	Microbial count				V <sub>c1</sub>	V <sub>c2</sub>	x̄	lg <i>N<sub>w</sub></i>	lg <i>N<sub>w</sub></i> ≥ lg 6,2 ?
		>330	>330	>330	>330					
	1,00E-04	>330	>330	>330	>330	>330	3,00E+07	7,48	<b>Yes</b>	
	1,00E-05	30	30	30	30					

Product-concentration [%]	Dilution	Microbial count				V <sub>c1</sub>	V <sub>c2</sub>	<i>N<sub>a</sub></i>	lg <i>N<sub>a</sub></i> = lg (x̄ oder x̄ <sub>wm</sub> )	lg <i>R</i> = (lg <i>N<sub>w</sub></i> = 7,48)
		>330	>330	>330	>330					
0,1	1,00E+00	>330	>330	>330	>330	>330	1,47E+04	4,17	3,31	
	1,00E-01	130	162	130	162					
	1,00E-02	16	16	16	16					
	<i>N<sub>ts</sub></i> =	58	<i>N<sub>ts</sub></i> < 1 ?	<b>No</b>	5 ≤ Quotient of x̄ <sub>wm</sub> ≤ 15 ?		<b>Yes</b>			
0,5	1,00E+00	34	35	34	35	3,45E+02	2,54	4,94		
	1,00E-01	6	7	<14	<14					
	1,00E-02	0	0	<14	<14					
	<i>N<sub>ts</sub></i> =	3	<i>N<sub>ts</sub></i> < 1 ?	<b>No</b>	5 ≤ Quotient of x̄ <sub>wm</sub> ≤ 15 ?		Na			
1,0	1,00E+00	2	9	<14	<14	<1,40E+02	< 2,15	≥ 5,33		
	1,00E-01	0	0	<14	<14					
	1,00E-02	0	0	<14	<14					
	<i>N<sub>ts</sub></i> =	0	<i>N<sub>ts</sub></i> < 1 ?	<b>Yes</b>	5 ≤ Quotient of x̄ <sub>wm</sub> ≤ 15 ?		Na			

\* Test procedure accredited according to DIN EN ISO/IEC 17025. Test report issued by Dr. Brill + Partner GmbH, Stiegstück 34, DE - 22339 Hamburg, Phone +49 40 557631-0, Telefax +49 40 557631-11, www.brillhygiene.com. No copying or transmission, in whole or in part, of this test report without the explicit prior written permission. The test results exclusively apply to the tested samples. Information on measurement uncertainty and Version history on request. © Dr. Brill + Partner GmbH 2022



Table 1.2: Validation, Controls and Evaluation

Product name: **Bacoban WBUS** Batch: 20210920\_Bacoban  
WBUS\_imi  
Test organism: *Enterococcus hirae* Temperature: 10°C ± 1°C  
Organic load: clean conditions Neutraliser: TLSC-SDS  
Contact time: **30 minutes** Test surface: stainless steel

Test and validation suspension ( <i>N</i> )				Control concerning toxicity of neutraliser ( <i>B</i> )				Control of neutralisation ( <i>C</i> ) At concentration: 1,0 %			
Dilution	V <sub>c1</sub>	V <sub>c2</sub>	Σ	Dilution	V <sub>c1</sub>	V <sub>c2</sub>	Σ	Dilution	V <sub>c1</sub>	V <sub>c2</sub>	Σ
1,00E-07	>330	>330	84	1,00E-04	>330	>330	47	1,00E-04	>330	>330	45
1,00E-08	42	42		1,00E-05	23	24		1,00E-05	20	25	
$\bar{x}_{xm} = 1,05E+08 = 8,021$				$\bar{x} = 2,35E+07 = 7,371$				$\bar{x} = 2,25E+07 = 7,352$			
7,57 ≤ lg <i>N</i> ≤ 8,10 ?			<b>Yes</b>	x̄ of <i>B</i> ≥ 0,5 x x̄ von <i>N<sub>w</sub></i> ?			<b>Yes</b>	x̄ of <i>C</i> ≥ 0,5 x x̄ von <i>N<sub>w</sub></i> ?			<b>Yes</b>

Water control ( <i>N<sub>w</sub></i> )	<i>N<sub>w</sub></i>	Microbial count				V <sub>c1</sub>	V <sub>c2</sub>	$\bar{x}$	lg <i>N<sub>w</sub></i>	lg <i>N<sub>w</sub></i> ≥ lg 6,2 ?
		1,00E-04	>330		>330		>330	>330	4,20E+07	7,62
	1,00E-05	37		47		37	47			

Product-concentration [%]	Dilution	Microbial count				V <sub>c1</sub>	V <sub>c2</sub>	<i>N<sub>a</sub></i>	lg <i>N<sub>a</sub></i> = lg (x̄ oder x̄ <sub>wm</sub> )	lg <i>R</i> =
										(lg <i>N<sub>w</sub></i> = 7,62)
0,1	1,00E+00	>330		>330		>330	>330	1,14E+04	4,06	3,57
	1,00E-01	114		114		114	114			
	1,00E-02	11		16		<14	16			
	<i>N<sub>ts</sub></i> =	50		<i>N<sub>ts</sub></i> < 1 ?	<b>No</b>	5 ≤ Quotient of x̄ <sub>wm</sub> ≤ 15 ?		<b>Yes</b>		
0,5	1,00E+00	23		29		23	29	2,60E+02	2,41	5,21
	1,00E-01	3		5		<14	<14			
	1,00E-02	0		0		<14	<14			
	<i>N<sub>ts</sub></i> =	1		<i>N<sub>ts</sub></i> < 1 ?	<b>No</b>	5 ≤ Quotient of x̄ <sub>wm</sub> ≤ 15 ?		Na		
1,0	1,00E+00	0		0		<14	<14	<1,40E+02	< 2,15	≥ 5,48
	1,00E-01	0		0		<14	<14			
	1,00E-02	0		0		<14	<14			
	<i>N<sub>ts</sub></i> =	0		<i>N<sub>ts</sub></i> < 1 ?	<b>Yes</b>	5 ≤ Quotient of x̄ <sub>wm</sub> ≤ 15 ?		Na		

\* Test procedure accredited according to DIN EN ISO/IEC 17025. Test report issued by Dr. Brill + Partner GmbH, Stiegstück 34, DE - 22339 Hamburg, Phone +49 40 557631-0, Telefax +49 40 557631-11, www.brillhygiene.com. No copying or transmission, in whole or in part, of this test report without the explicit prior written permission. The test results exclusively apply to the tested samples. Information on measurement uncertainty and Version history on request. © Dr. Brill + Partner GmbH 2022



Table 1.3: Validation, Controls and Evaluation

Product name: **Bacoban WBUS** Batch: 20210920\_Bacoban  
WBUS\_imi  
Test organism: *Proteus hauseri* Temperature: 10°C ± 1°C  
Organic load: clean conditions Neutraliser: TLSC-SDS  
Contact time: **30 minutes** Test surface: stainless steel

Test and validation suspension ( <i>N</i> )				Control concerning toxicity of neutraliser ( <i>B</i> )				Control of neutralisation ( <i>C</i> ) At concentration: 1,0 %			
Dilution	V <sub>c1</sub>	V <sub>c2</sub>	Σ	Dilution	V <sub>c1</sub>	V <sub>c2</sub>	Σ	Dilution	V <sub>c1</sub>	V <sub>c2</sub>	Σ
1,00E-07	>330	>330	94	1,00E-04	78	78	179	1,00E-04	28	34	68
1,00E-08	46	48		1,00E-05	9	14		1,00E-05	3	3	
$\bar{x}_{xm} = 1,18E+08 =$			8,07	$\bar{x} = 8,14E+06 =$			6,91	$\bar{x} = 3,09E+06 =$			6,49
7,57 ≤ lg <i>N</i> ≤ 8,10 ?			<b>Yes</b>	x̄ of <i>B</i> ≥ 0,5 x x̄ von <i>N<sub>w</sub></i> ?			<b>Yes</b>	x̄ of <i>C</i> ≥ 0,5 x x̄ von <i>N<sub>w</sub></i> ?			<b>Yes</b>
Water control ( <i>N<sub>w</sub></i> )	<i>N<sub>w</sub></i>		Microbial count			V <sub>c1</sub>	V <sub>c2</sub>	x̄	lg <i>N<sub>w</sub></i>	lg <i>N<sub>w</sub></i> ≥ lg 6,2 ?	
	1,00E-04	26		31		26	31	2,85E+06	6,45	<b>Yes</b>	
	1,00E-05	4		4		4	4				
Product-concentration [%]	Dilution	Microbial count			V <sub>c1</sub>	V <sub>c2</sub>	<i>N<sub>a</sub></i>	lg <i>N<sub>a</sub></i> = lg (x̄ oder x̄ <sub>wm</sub> )	lg <i>R</i> = (lg <i>N<sub>w</sub></i> = 6,45)		
	0,1	1,00E+00	22		28		22	28	2,50E+02	2,40	4,06
		1,00E-01	2		4		<14	<14			
		1,00E-02	0		0		<14	<14			
	<i>N<sub>ts</sub></i> =	0		<i>N<sub>ts</sub></i> < 1 ?	<b>Yes</b>	5 ≤ Quotient of x̄ <sub>wm</sub> ≤ 15 ?		Na			
0,5	1,00E+00	0		0		<14	<14	<1,40E+02	< 2,15	≥ 4,31	
	1,00E-01	0		0		<14	<14				
	1,00E-02	0		0		<14	<14				
	<i>N<sub>ts</sub></i> =	0		<i>N<sub>ts</sub></i> < 1 ?	<b>Yes</b>	5 ≤ Quotient of x̄ <sub>wm</sub> ≤ 15 ?		Na			
1,0	1,00E+00	0		0		<14	<14	<1,40E+02	< 2,15	≥ 4,31	
	1,00E-01	0		0		<14	<14				
	1,00E-02	0		0		<14	<14				
	<i>N<sub>ts</sub></i> =	0		<i>N<sub>ts</sub></i> < 1 ?	<b>Yes</b>	5 ≤ Quotient of x̄ <sub>wm</sub> ≤ 15 ?		Na			

\* Test procedure accredited according to DIN EN ISO/IEC 17025. Test report issued by Dr. Brill + Partner GmbH, Stiegstück 34, DE - 22339 Hamburg, Phone +49 40 557631-0, Telefax +49 40 557631-11, www.brillhygiene.com. No copying or transmission, in whole or in part, of this test report without the explicit prior written permission. The test results exclusively apply to the tested samples. Information on measurement uncertainty and Version history on request. © Dr. Brill + Partner GmbH 2022



Table 1.4: Validation, Controls and Evaluation

Product name: **Bacoban WBUS** Batch: 20210920\_Bacoban  
WBUS\_imi  
Test organism: *Pseudomonas aeruginosa* Temperature: 10°C ± 1°C  
Organic load: clean conditions Neutraliser: TLSC-SDS  
Contact time: **30 minutes** Test surface: stainless steel

Test and validation suspension (M)				Control concerning toxicity of neutraliser (B)				Control of neutralisation (C) At concentration: 1,0 %			
Dilution	V <sub>c1</sub>	V <sub>c2</sub>	Σ	Dilution	V <sub>c1</sub>	V <sub>c2</sub>	Σ	Dilution	V <sub>c1</sub>	V <sub>c2</sub>	Σ
1,00E-07	>330	>330	93	1,00E-04	>330	>330	66	1,00E-04	>330	>330	76
1,00E-08	42	51		1,00E-05	28	38		1,00E-05	36	40	
$\bar{x}_{xm} = 1,16E+08 = 8,07$				$\bar{x} = 3,30E+07 = 7,52$				$\bar{x} = 3,80E+07 = 7,58$			
$7,57 \leq \lg N \leq 8,10?$ <b>Yes</b>				$\bar{x}$ of B $\geq 0,5 \times \bar{x}$ von $N_W$ <b>Yes</b>				$\bar{x}$ of C $\geq 0,5 \times \bar{x}$ von $N_W$ <b>Yes</b>			
Water control ( $N_W$ )	$N_W$		Microbial count		V <sub>c1</sub>	V <sub>c2</sub>	$\bar{x}$	$\lg N_W$	$\lg N_W \geq \lg 6,2?$		
	1,00E-04	>330	>330	>330	>330	>330	4,15E+07	7,62	<b>Yes</b>		
	1,00E-05	38	45	38	45						
Product-concentration [%]	Dilution	Microbial count		V <sub>c1</sub>	V <sub>c2</sub>	$N_a$	$\lg N_a = \lg (\bar{x}$ oder $\bar{x}_{wm})$	$\lg R =$ ( $\lg N_W = 7,62$ )			
	0,1	1,00E+00	>330	>330	>330	>330	>3,30E+05	> 5,52	$\leq 2,10$		
		1,00E-01	>330	>330	>330	>330					
		1,00E-02	>330	>330	>330	>330					
	$N_{ts} =$	>330	$N_{ts} < 1?$	<b>No</b>	5 ≤ Quotient of $\bar{x}_{wm} \leq 15?$		Na				
0,5	1,00E+00	>330	>330	>330	>330	3,45E+04	4,54	3,08			
	1,00E-01	>330	>330	>330	>330						
	1,00E-02	34	35	34	35						
	$N_{ts} =$	>330	$N_{ts} < 1?$	<b>No</b>	5 ≤ Quotient of $\bar{x}_{wm} \leq 15?$		Na				
1,0	1,00E+00	10	12	<14	<14	<1,40E+02	< 2,15	$\geq 5,47$			
	1,00E-01	0	2	<14	<14						
	1,00E-02	0	0	<14	<14						
	$N_{ts} =$	0	$N_{ts} < 1?$	<b>Yes</b>	5 ≤ Quotient of $\bar{x}_{wm} \leq 15?$		Na				

\* Test procedure accredited according to DIN EN ISO/IEC 17025. Test report issued by Dr. Brill + Partner GmbH, Stiegstück 34, DE - 22339 Hamburg, Phone +49 40 557631-0, Telefax +49 40 557631-11, www.brillhygiene.com. No copying or transmission, in whole or in part, of this test report without the explicit prior written permission. The test results exclusively apply to the tested samples. Information on measurement uncertainty and Version history on request. © Dr. Brill + Partner GmbH 2022



#### 4 List of Abbreviations

cfu	=	colony forming units (viable microbial count)
N	=	test and validation suspension
$N_w$	=	$\log_{10}$ cfu per test surface of water control
$N_a$	=	$\log_{10}$ cfu per test surface of disinfection test
B	=	toxicity of neutraliser
C	=	neutralisation control
$N_{ts}$	=	remaining cfu on test surface
RF	=	germicidal activity ( $\lg N_w - \lg N_a$ )
Na	=	not applicable
n.t.	=	not tested
$\Sigma$	=	sum of $V_c$
$V_c$	=	viable microbial count per ml
$\bar{x}$	=	mean of $V_c$

\* Test procedure accredited according to DIN EN ISO/IEC 17025. Test report issued by Dr. Brill + Partner GmbH, Stiegstück 34, DE - 22339 Hamburg, Phone +49 40 557631-0, Telefax +49 40 557631-11, www.brillhygiene.com. No copying or transmission, in whole or in part, of this test report without the explicit prior written permission. The test results exclusively apply to the tested samples. Information on measurement uncertainty and Version history on request. © Dr. Brill + Partner GmbH 2022



DR. F. H. H. BRILL · C/O DR. BRILL + PARTNER GMBH · STIEGSTÜCK 34 · DE-22339 HAMBURG

ROPIMEX R. OPEL GmbH  
Bildstocker Straße 12  
DE - 66538 Neunkirchen

Hamburg, 16 November 2021

## Expert opinion


### Yeasticidal Activity of **Bacoban WBUS** in the quantitative surface test according to DIN EN 16438:2014 (Phase 2, Step 2)

The disinfectant **Bacoban WBUS** was tested and evaluated according to DIN EN 16438:2014 „ Chemical disinfectants and antiseptics – Quantitative surface test for the evaluation of fungicidal or yeasticidal activity of chemical disinfectants and antiseptics used in the veterinary area on non-porous surfaces without mechanical action – Test method and requirements (phase 2, step 2)“.

According to the test report no. L21/01041.3 dated 16/11/2021 of Dr. Brill + Partner GmbH the preparation showed yeasticidal activity under clean conditions at a test temperature of 10°C ± 1°C.

**Bacoban WBUS** complies with the requirements of DIN EN 16438:2014 (phase 2, step 2) with the following concentration-time relationship:

<b>Yeasticidal:</b>	<b>clean conditions</b>	<b>0.5 %</b>	<b>30 minutes</b>
---------------------	-------------------------	--------------	-------------------



Dr. Florian H. H. Brill



Test report no L21/01041.3

Quantitative surface test for the evaluation of fungicidal or yeasticidal activity of **Bacoban WBUS** in veterinary area according to DIN EN 16438:2014 (Phase 2, step 2)\*

In accordance with your order, we tested the preparation **Bacoban WBUS** for its activity in the quantitative surface test according to DIN EN 16438:2014 \* under clean conditions.

**1 General Information and Material**

1.1 Client

Client: ROPI-MEX R. OPEL GmbH, Frau Jennifer Sahl, Bildstocker Straße 12,  
DE - 66538 Neunkirchen, Germany  
Date of order: 24/09/2021  
Confirmation no.: 225183

1.2 Identification of Test Laboratory

Location: Dr. Brill + Partner GmbH · Institute for Hygiene and Microbiology,  
Stiegstück 34, DE-22339 Hamburg, Germany  
Study manager: Dipl.-Ing. Dr. rer. nat. Andreas Kampe  
Scientific assistant: Dipl.-Biol. Dr. rer. nat. Jan-Hendrik Klock  
Laboratory technicians: Elahe Saroukhani

1.3 Table of Contents

General Information and Material	1
Methods	3
Results	3
Tables	4
List of Abbreviations	5

1.4 Identification of Sample

Name of product: **Bacoban WBUS**  
Batch no.: 20210920\_Bacoban WBUS\_imi

\* Test procedure accredited according to DIN EN ISO/IEC 17025. Test report issued by Dr. Brill + Partner GmbH, Stiegstück 34, DE - 22339 Hamburg, Phone +49 40 557631-0, Telefax +49 40 557631-11, www.brillhygiene.com. No copying or transmission, in whole or in part, of this test report without the explicit prior written permission. The test results exclusively apply to the tested samples. Information on measurement uncertainty and Version history on request. © Dr. Brill + Partner GmbH 2021



Internal no.:	21/01202
Manufacturer:	ROPIMEX R. OPEL GmbH, DE - 66538 Neunkirchen, Germany
Date of delivery:	21/09/2021
Storage conditions:	room temperature and darkness
Appearance of product:	clear liquid
Odour:	characteristic
Product type:	surface disinfectant
Recommended diluent:	Tap water
Diluent used:	water of standardised hardness (WSH, pH 7.0)
pH value, concentrate:	4.3
pH value, 1.0 % (measured in WSH):	6.4
pH value, 0.5 % (measured in WSH):	6.7
pH value, 0.1 % (measured in WSH):	7.0
Active agents (Manufacturer's data):	33.31 g benzalkoniumchloride

#### 1.5 Test Conditions

Test period:	27/10/ - 01/11/2021
Lab task no.:	L21/01041.3
Product test concentrations:	0.1 + 0.5 + 1.0 %
Exposure time:	30 minutes
Germ carrier:	stainless steel disc
Test temperature:	10°C ± 1°C
Incubation temperature:	30°C ± 1°C
Organic load:	clean conditions (3.0 g/L bovine albumin)
Neutraliser:	60 g/L polysorbate 80, 60 g/L saponine, 8 g/L lecithin, 1 g/L histidine, 2.5 g/L SDS (TLSH-SDS)
Test organisms:	<i>Candida albicans</i> ATCC 10231

\* Test procedure accredited according to DIN EN ISO/IEC 17025. Test report issued by Dr. Brill + Partner GmbH, Stiegstück 34, DE - 22339 Hamburg, Phone +49 40 557631-0, Telefax +49 40 557631-11, [www.brillhygiene.com](http://www.brillhygiene.com). No copying or transmission, in whole or in part, of this test report without the explicit prior written permission. The test results exclusively apply to the tested samples. Information on measurement uncertainty and Version history on request. © Dr. Brill + Partner GmbH 2021



## 2 Methods

The tests were carried out according to DIN EN 16438:2014 " Chemical disinfectants and antiseptics – Quantitative surface test for the evaluation of fungicidal or yeasticidal activity of chemical disinfectants and antiseptics used in the veterinary area on non-porous surfaces without mechanical action – Test method and requirements (phase 2, step 2); German version EN 16438:2014".

## 3 Results

The test results based on DIN EN 16438:2014 are summarised in table 1.

The test yeast *C. albicans* was sufficiently (RF >3) inactivated with the following concentration-time relationship:

Yeasticidal:                                      clean conditions                                      0.5 %                                      30 minutes

Hamburg, 16/11/2021

Dipl.-Ing. Dr. rer. nat. Andreas Kampe  
Study Manager

Dipl.-Biol. Henrik Gabriel  
Head of Laboratory



\* Test procedure accredited according to DIN EN ISO/IEC 17025. Test report issued by Dr. Brill + Partner GmbH, Stiegstück 34, DE - 22339 Hamburg, Phone +49 40 557631-0, Telefax +49 40 557631-11, www.brillhygiene.com. No copying or transmission, in whole or in part, of this test report without the explicit prior written permission. The test results exclusively apply to the tested samples. Information on measurement uncertainty and Version history on request. © Dr. Brill + Partner GmbH 2021



Table 1: Validation, Controls and Evaluation (DIN EN 16438:2014\*)

Product name:	<b>Bacoban WBUS</b>	Batch:	20210920_Bacoban WBUS_imi
Test organism:	<i>Candida albicans</i>	Temperature:	10°C ± 1°C
Organic load:	clean conditions	Neutraliser:	TLSH-SDS
Contact time:	<b>30 minutes</b>	Germ carrier:	stainless steel disc

Test and validation suspension (N)			Toxicity control (B)			Validation neutralisation medium / Neutralisation control (C)		
	V <sub>c1</sub>	V <sub>c2</sub>		V <sub>c1</sub>	V <sub>c2</sub>	Product	1,00 %	
1,00E-06	>330	>330	1,00E-03	>330	>330	1,00E-03	>330	>330
1,00E-07	27	28	1,00E-04	35	42	1,00E-04	40	45
$\bar{x} =$	6,88E+06 = 6,84 lg		$\bar{x} =$	3,85E+06 = 6,59 lg		$\bar{x} =$	4,25E+06 = 6,63 lg	
6,57 ≤ lg N ≤ 7,1? <b>Yes</b>			B > 0,5 x N <sub>W</sub> ? <b>Yes</b>			C > 0,5 x N <sub>W</sub> ? <b>Yes</b>		

<b>Water control</b>	Water control (N <sub>W</sub> ):	N <sub>W</sub>	V <sub>c1</sub>	V <sub>c2</sub>	$\bar{x} =$	4,00E+06
		1,00E-03	>330	>330	lgN <sub>W</sub> =	<b>6,60</b>
		1,00E-04	39	41	lgN <sub>W</sub> ≥ 5,27 log? <b>Yes</b>	

Test	Concentration of product test solution [%]	Dilution step	V <sub>c1</sub>	V <sub>c2</sub>	N <sub>a</sub>	lg N <sub>a</sub>	R	Exposure time (min)
					( $\bar{x}$ v $\bar{x}$ wm) cfu/ml	lg ( $\bar{x}$ v $\bar{x}$ wm)	(lgN <sub>W</sub> =6,60) lgN <sub>W</sub> - lgN <sub>a</sub>	
0,10		1,00E+00	>330	>330	> 3,30E+05	> 5,52	≤ 1,08	30
		1,00E-01	>330	>330				
		1,00E-02	>330	>330				
0,50		1,00E+00	6	10	< 1,40E+02	< 2,15	≥ 4,45	30
		1,00E-01	0	0				
		1,00E-02	0	0				
1,00		1,00E+00	0	0	< 1,40E+02	< 2,15	≥ 4,45	30
		1,00E-01	0	0				
		1,00E-02	0	0				

\* Test procedure accredited according to DIN EN ISO/IEC 17025. Test report issued by Dr. Brill + Partner GmbH, Stiegstück 34, DE - 22339 Hamburg, Phone +49 40 557631-0, Telefax +49 40 557631-11, www.brillhygiene.com. No copying or transmission, in whole or in part, of this test report without the explicit prior written permission. The test results exclusively apply to the tested samples. Information on measurement uncertainty and Version history on request. © Dr. Brill + Partner GmbH 2021



#### 4 List of Abbreviations

$\bar{x}$	=	mean of a and a' and x and x'
B	=	control of toxicity of neutraliser
C	=	neutralisation control
cfu	=	colony forming units (viable microbial count)
N	=	test suspension
n.t.	=	not tested
$N_a$	=	$\log_{10}$ cfu per test surface of disinfection test
$N_w$	=	$\log_{10}$ cfu per test surface of water control
R	=	germicidal activity ( $N_w - N_a$ )
Vc	=	viable microbial count per ml of the test suspension

\* Test procedure accredited according to DIN EN ISO/IEC 17025. Test report issued by Dr. Brill + Partner GmbH, Stiegstück 34, DE - 22339 Hamburg, Phone +49 40 557631-0, Telefax +49 40 557631-11, [www.brillhygiene.com](http://www.brillhygiene.com). No copying or transmission, in whole or in part, of this test report without the explicit prior written permission. The test results exclusively apply to the tested samples. Information on measurement uncertainty and Version history on request. © Dr. Brill + Partner GmbH 2021