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	Revision	0
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Die Biologische Effektivität von DDAC

Biological Efficacy of DDAC


Revision	Date	Effective Pages	Changes
0	02.04.2020	All	Initial Release

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1 Introduction

Company Name & Address:

SFT Surface Treatment GmbH
Egnacherweg 11
8590 Romanshorn
Switzerland

Document N°:


SFT200025

2 Scope

This Report shows a selection of organisms that DDAC has been tested successfully with. Therefore the ready-to-use disinfectants was tested against the in chapter 3 mentioned organisms.

Item No.	Description	Composition
ST-010-003	SFT Hard Surface Interior Disinfectant	Didecyldimethylammoniumchloride (DDAC)

3 Overview of biological efficacy DDAC

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Antimicrobial Performance

Food, Industrial and Institutional Areas
Tested According to European Norms (EN)

Activity Claim: Bactericidal

EN 1276

Bactericidal result (log 5), in presence of dairy organic load
Test strains: *P. aeruginosa*, *S. aureus*, *E. coli* and *E. hirae*

Result	1.5%	3.0 g/l BSA	5 min.
Result	1.5%	10.0 g/l Skimmed milk	5 min.
Result	1.0%	10.0 g/l Sucrose	5 min.
Result	1.5%	10.0 g/l Yeast extract	5 min.

Certificate: Eurofins, 31 May 2016

EN 1276 (modified)

Bactericidal result (log 4), in presence of low organic load (BSA)
Test strains: *L. interrogans* (Weil's disease)

Result	1.0%	0.3 g/l BSA	5 min
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Certificate: Blue Scientific Test Data, August 2009

EN 1276 (MRSA)

Bactericidal result (log 5), in presence of high organic load (BSA) at 20°C

Test strains: *S. aureus* MRSA ATCC 33592

Result	1.0%	3.0 g/l BSA	5 min.
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Certificate: L + S AG, June 2010

EN 13697

Bactericidal result (log 4), in presence of high organic load (BSA)
Test strains: *P. aeruginosa*, *S. aureus*, *E. coli* and *E. hirae*

Result	2.5%	3.0 g/l BSA	5 min.
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Certificate: Eurofins-Biolab Spa, 30 July 2007

Activity Claim: Yeasticidal

EN 1650

Yeasticidal result (log 4), in presence of high organic load (BSA)
Test strain: *C. albicans*

Result	0.5%	3.0 g/l BSA	15 min.
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Certificate: Eurofins, 31 May 2016

EN 13697

Yeasticidal result (log 3), in presence of high organic load (BSA)
Test strains: *C. albicans*

Result	2.0%	3.0 g/l BSA	15 min.
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Certificates: Eurofins, 31 May 2016

Activity Claim: Fungicidal

EN 1650

Fungicidal result (log 4), in presence of low organic load (Albumin)
Test strains: *A. brasiliensis* (formerly known as *A. niger*)

Result	2.5%	0.3 g/l Albumin	15 min.
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Certificate: Eurofins, 17 June 2011

EN 13697

Fungicidal result (log 3), in presence of high organic load (Albumin)
Test strains: *A. brasiliensis* (formally known as *A. niger*)

Result	4.0%	3.0 g/l Albumin	15 min.
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Certificates: Eurofins-Biolab Spa, 23 April 2007

Activity Claim: Sporicidal

EN 13704

Sporicidal result (log 3), in presence of low organic load (BSA)
Test Strain: *C. difficile* ATCC 9689

Result	5.0%	0.3 g/l BSA	60 min.
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Certificate: Dr. Brill + Partner GmbH, 13 March 2009

EN 13704

Sporicidal result (log 3) in presence of low organic load (BSA)
Test strain: *B. subtilis* ATCC 6633

Result	5.0%	0.3 g/l BSA	60 min.
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Certificate: L+S, 23 April 2012

EN 13704

Sporicidal result (log 3) in presence of low organic load (BSA)
Test strains: *B. cereus* ATCC 12826

Result	4.0%	0.3 g/l BSA	60 min
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Certificate: Eurofins, 31 May 2016

Activity Claim: Virucidal Performance Against Bacteriophages

EN 13610


Virucidal activity against bacteriophages according to EN 13610 in presence organic load (1% skimmed milk)

Results:

<i>Lactococcus lactis</i> subsp. <i>lactis</i> phage P001:	3.0%	15 min.
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<i>Lactococcus lactis</i> subsp. <i>lactis</i> phage P008:	3.0%	15 min.
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Certificate: Dr. Brill + Partner GmbH, 25 February 2014

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Medical Areas

Tested According to European Norms (EN)

Activity Claim: Bactericidal

EN 13727

Bactericidal result (log 5), in presence of high medical organic load (BSA + Erythrocytes)

Test strains: *P. aeruginosa*, *S. aureus* and *E. hirae*

Result	2.0%	3.0 g/l (BSA + Erythrocytes)	5 min.
Result	1.0%	3.0 g/l (BSA + Erythrocytes)	60 min.

Certificate: Eurofins, 17 June 2011

EN 13697

Bactericidal result (log 4), in presence of high medical organic load (BSA + Erythrocytes)

Test strains: *P. aeruginosa*, *S. aureus* and *E. hirae*

Result	7.0%	3.0 g/l (BSA + Erythrocytes)	5 min.
Result	1.0%	3.0 g/l (BSA + Erythrocytes)	60 min.

Certificate: Eurofins, 6 June 2016

EN 14561

Bactericidal result (log 5), in presence of low organic load (BSA)

Test strains: *P. aeruginosa*, *S. aureus* and *E. hirae*

Result	2.5%	0.3 g/l BSA	15 min.
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Certificate: Eurofins, 23 September 2011

Activity Claim: Yeasticidal

EN 13624

Yeasticidal result (log 4), in presence of high medical organic load (BSA + Erythrocytes)

Test strain: *C. albicans*

Result:	1.0%	3.0 g/l (BSA + Erythrocytes)	5 min.
Result:	0.25%	3.0 g/l (BSA + Erythrocytes)	60 min.

Certificate: Eurofins, 31 May 2016

EN 13697

Yeasticidal result (log 3), in presence of high medical organic load (BSA + Erythrocytes)

Test strain: *C. albicans*

Result:	3.0%	3.0 g/l (BSA + Erythrocytes)	5 min.
Result:	1.0%	3.0 g/l (BSA + Erythrocytes)	60 min.

Certificate: Eurofins, 6 June 2016

EN 14562

Yeasticidal result (log 4), in presence of low organic load (BSA)

Test strain: *C. albicans*

Result:	3.0%	0.3 g/l BSA	15 min.
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Certificate: Eurofins, 23 September 2011

Activity Claim: Fungicidal

EN 13624

Fungicidal result (log 4), in presence of high medical organic load (BSA + Erythrocytes)

Test strain: *A. brasiliensis* (formerly known as *A. niger*)

Result	4.0%	3.0 g/l (BSA + Erythrocytes)	60 min.
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Certificate: Eurofins, 6 June 2016

EN 13697:2015

Fungicidal result (log 3), in presence of high medical organic load (BSA + Erythrocytes)

Test strain: *A. brasiliensis*

Result	6.0%	3.0 g/l (BSA + Erythrocytes)	60 min.
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Certificate: Dr. Brill + Partner GmbH, 17 February 2017

Activity Claim: Full Virucidal

EN 14476

Virucidal result (log 4), in presence of low organic load (BSA) and high medical organic load (BSA + Erythrocytes)

Test strain: *Poliovirus*

Result	4.0%	0.3 g/l BSA	30 min.
Result	6.0%	3.0 g/l BSA + Erythrocytes	120 min.

Certificate: Dr. J. Steinmann, MikroLab, 27 July 2010

EN 14476

Virucidal result (log 4), in presence of low organic load (BSA) and high medical organic load (BSA + Erythrocytes)

Test strain: *Adenovirus*

Result	2.0%	0.3 g/l BSA	15 min.
Result	2.0%	3.0 g/l BSA + Erythrocytes	60 min.
Result	4.0%	3.0 g/l BSA + Erythrocytes	15 min.

Certificate: Dr. J. Steinmann, MikroLab, 27 July 2010

EN 14476


Virucidal result (log 4), in presence of low organic load (BSA) and high medical organic load (BSA + Erythrocytes)

Test strain: *Norovirus* (murine Norovirus as surrogate for human Norovirus)

Result	2.0%	0.3 g/l BSA	5 min.
Result	2.0%	3.0 g/l BSA + Erythrocytes	15 min.

Certificate: Dr. J. Steinmann, MikroLab, 1 April 2014

After evaluation with Poliovirus, Adenovirus and MNV (murine Norovirus) the surface disinfectant DDAC can be declared as having "virucidal" properties according to EN 14476.

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Therefore, after successful experiments with the above mentioned non-enveloped viruses the surface disinfectant DDAC is also effective against enveloped viruses including HBV, HCV and HIV (blood-borne viruses), all members of the Coronaviridae family including MERS-CoV, the Filoviridae family including Ebola virus and the Paramyxoviridae family including Measles virus.

Result	4.0%	0.3 g/l BSA	30 min.
Result	6.0%	3.0g/l BSA + Erythrocytes	120 min.
Statements: Dr. J. Steinmann, 8 March 2015			

EN 14476

Virucidal result (log 4), in presence of high medical organic load (BSA + Erythrocytes)

Test strain: *Influenza A (H7N9) Virus*

Result	0.5%	3.0g/l BSA + Erythrocytes	5 min.
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Certificate: Microbac Laboratory, Sterling VA20164 (USA), 13 September 2013

EN 14476:2013+A1:2015

Virucidal result (log 4), in presence of high medical organic load (BSA + Erythrocytes)

Test strain: *Influenza A (H1N1) Virus*

Result	0.5%	3.0g/l BSA + Erythrocytes	5 min.
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Certificate: Dr. J. Steinmann, Dr. Brill + Partner GmbH, Bremen, 8 February 2017

EN 14476

Virucidal result (log 4), in presence of high medical organic load (BSA + Erythrocytes)

Test strain: Duck Hepatitis B (as a surrogate for Hepatitis B (HBV))

Result:	5.0%	3.0 g/l BSA + Erythrocytes	5 min.
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Certificate: Blu Test Laboratories Ltd., 27 July 2016

EN 14476

Virucidal result (log 4), in presence of low organic load (BSA)

Test strain: *Bovine Corona Virus (BCoV)* (as a surrogate for other members of the Coronavirus family including MERS-CoV)

Result:	1.0%	0.3 g/l BSA	1 min.
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Certificate: Dr. J. Steinmann, MikroLab, 25 May 2014

EN 14476:2013+A1:2015

Virucidal result (log 4), in presence of high medical organic load (BSA + Erythrocytes)

Test strain: *Modified Vaccinia Virus Ankara (MVA)*

Result:	1.0%	3.0 g/l BSA + Erythrocytes	5 min.
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Certificate: Dr. J. Steinmann, Dr. Brill + Partner GmbH, Bremen, 7 February 2017

Activity Claim: Sporicidal

EN 13704

Sporicidal result (log 3), in presence of low organic load (BSA)

Test Strain: *C.difficile ATCC 9689*

Results:	5.0%	0.3 g/l BSA	60 min.
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Certificate: Dr. Brill + Partner GmbH, 13 March 2009

Test According to VAH

Test strains: *P. aeruginosa*, *S. aureus*, *E. hirae* and *C. albicans*

Results low organic load	2.0%	15 and 30 min.
	1.0%	60 min.
	0.5%	240 min.
Results increased organic load	2.0%	15, 30 and 60 min.
	1.0%	240 min.

Certificates:

Prof. Dr. R. Schubert, Frankfurt (M), 29 December 2002

Prof. Dr. H.-P. Werner, Schwerin, 4 October 2002

Veterinary Areas

Tested According to European Norms (EN)

Activity Claim: Bactericidal

EN 1656

Bactericidal result (log 5), in presence of high veterinary organic load (Yeast Extract + BSA) at 10°C

Test strains: *P. aeruginosa*, *S. aureus*, *E. hirae* and *P. vulgaris*

Result	4.0%	10.0 g/l Yeast extract + 10.0g/l BSA	30 min.
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Certificate: Eurofins, 31 May 2016

EN 14349 (non-porous surfaces)

Bactericidal result (log 4), in presence of high veterinary organic load (Yeast Extract + BSA) at 10°C

Test strains: *P. aeruginosa*, *S. aureus*, *E. hirae* and *P. vulgaris*

Result	6.0%	10.0 g/l Yeast extract + 10.0g/l BSA	30 min.
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Certificate: Eurofins, 31 May 2016

Activity Claim: Yeastcidal

EN 1657

Yeastcidal result (log 4), in presence of high veterinary organic load (Yeast Extract + BSA) at 10°C

Test strains: *C. albicans*

Result	2.0%	10.0 g/l Yeast extract + 10.0g/l BSA	30 min.
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Certificate: Eurofins, 31 May 2016

EN 16438


Yeastcidal result (log 3), in presence of high veterinary organic load (Yeast Extract + BSA) at 10°C

Test strains: *C. albicans*

Result	2.0%	10.0 g/l Yeast extract + 10.0g/l BSA	30 min.
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Result	1.0%	10.0 g/l Yeast extract + 10.0g/l BSA	60 min.
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Certificate: Dr Brill + Dr Steinmann, 5 October 2016; Eurofins, 31 May 2016

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Activity Claim: Virucidal

EN 14675:2015

Virucidal result (log 4), in presence of high-level soiling (BSA + Yeast extract) at 10°C

Test strains: *Modified Vaccinia Virus Ankara (MVA)*

Result 3.0% 10g/l BSA + 10g/l Yeast extract 30 min.

Certificate: Dr. J. Steinmann, Dr. Brill + Partner GmbH, Bremen, 25 January 2017

Tested According to DVG (German Veterinary Medical Society)

Food Sector, 8th List

Disinfectants for handling / processing area: Meat production and food of animal origin (except milk) and canteen kitchens.

Test strains: *P. aeruginosa*, *S. aureus*, *E. hirae*, *E. coli*, *C. albicans* and *A. brasiliensis*

General DVG recommendation: For effective disinfection, the use of 0.4 litre use solution per m² surface is normally necessary.

Deployed application concentrations are specified in volume percentage (V-%) for 5 and 30 minutes (Fungicide part C: 15 and 30 minutes)

Low contaminated area (basic organic load)

List Part	Temp /°C	Bacteria		Yeast (Levurocide)		Yeast and Moulds (Fungicide)		Virus	
		5a	5b	6a	6b	7a	7b	8a	8b
–	4	5a	5b	6a	6b	7a	7b	8a	8b
–	–	5´	30´	5´	30´	5´	30´	5´	30´
A	10	2	1	2	1	5	4	–	–
A	20	2	1	3	1,5	5	4	–	–
B	10	–	–	–	–	–	–	–	–
B	20	–	–	–	–	–	–	–	–
–	–	–	–	–	–	15´	–	–	–
C	20	2	1	3	1	4	4	–	–

Contaminated area (high organic load)

List Part	Temp /°C	Bacteria		Yeast (Levurocide)		Yeast and Moulds (Fungicide)		Virus	
		9a	9b	10a	10b	11a	11b	12a	12b
–	4	9a	9b	10a	10b	11a	11b	12a	12b
–	–	5´	30´	5´	30´	5´	30´	5´	30´
A	10	4	2,5	3,5	1,5	10	?	–	–
A	20	4	2	5	2	10	?	–	–

A Meat production and food of animal origin (except milk)

B Milk area

C Canteen kitchens

DVG committee disinfection decided that the formulation Lonzagard® DR-25aN can be DVG listed (8th list, meat production and food of animal origin (except milk) and canteen kitchens).

Prof. Rösler (DVG, chairman of the committee disinfection), Berlin

Certificates: Prof. Dr. U. Rösler (chairman of the committee disinfection), Berlin, 9 December 2014

Laboklin, Dr. B. Hunsinger, Bad Kissingen, 16 June 2014

Virucidal Performance

Tested According to BGA (now RKI) and DWV

Equivalence expertise based on formulation DDAC regarding virus inactivating properties of DDAC

Poliovirus

Results according to BGA (now RKI) and DVV

With soil load	5.0%	15 min.
	4.0%	60 min.

Certificate: Dr. J. Steinmann, Bremen, 15 February 2002

ECBO Virus

Results according to BGA (now RKI) and DVV

With soil load	5.0%	30 min.
	3.0%	60 min.

Certificate: Dr. J. Steinmann, Bremen, 21 August 2002

Adenovirus

Result according to BGA (now RKI) and DVV

With soil load	4.0%	30 min.
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Certificate: Dr. J. Steinmann, Bremen, 24 May 2005

Norovirus

Result according to BGA (now RKI) and DVV

Test strain: *Feline calici virus (FCV)*

With soil load	4.0%	30 min.
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Certificate: Dr. J. Steinmann, Bremen, 25 May 2005

Rota Virus

Result according to BGA (now RKI) and DVV

Without soil load	3.0%	15 min.
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Certificate: Dr. J. Steinmann, Bremen, 8 June 2005

Vaccinia Virus

Result according to BGA (now RKI) and DVV

With soil load	2.0%	5 min.
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Certificate: Dr. J. Steinmann, Bremen, 30 July 2005

Polyoma Virus SV 40 (formerly Papova virus)

Result according to BGA (now RKI) and DVV

With soil load	2.0%	30 min.
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Certificate: Dr. J. Steinmann, Bremen, 9 March 2006

Summary of Dr. J. Steinmann, MikroLab Bremen

The surface disinfectant Lonzagard® DR-25aN fulfils the requirement "virucidal" defined by a working group "Viruzidie" of the Robert Koch-Institute (RKI), the expert group of DVV (German Association for the Control of Virus Diseases) "virus disinfection" and the disinfectant commission of DGHM (now VAH). Following this recommendation a disinfectant can be declared "virucidal", if it is able to inactivate the following four test viruses (Polio-, Adeno-, Vaccinia- and Polyoma virus (SV40) in a quantitative suspension test under defined conditions.