BRAINCON technologies efficient. innovative. safe. DCX disinfection control extended

Smart and Sophisticated Bio Decontamination

Raise your standards

efficient.
innovative.
safe.

DCX
disinfection control
extended

Braincon – our vision – our mission

efficient.
innovative.
safe.

DCX
disinfection control extended

Braincon GmbH & Co KG

an Austrian high-tech company for medical solutions with own developed and produced innovations. One main area is research, production and further development of decontamination systems as well as providing disinfection and decontamination services

Mission

„The future of new technologies must be actively pursued today with research and development in order to improve medical care, quality of life and safety.“

DCX Technology - Size works

DCX Technologies has shown the “Proof of Concept” in many different situations. The microbiological results were measured and documented in several tests.

The DCX decontamination is recommended wherever microorganisms or insects pose a threat for humans (public transport, hotels, hospitals, etc.), or products (Food Industry, pharmaceutical industry, etc.)

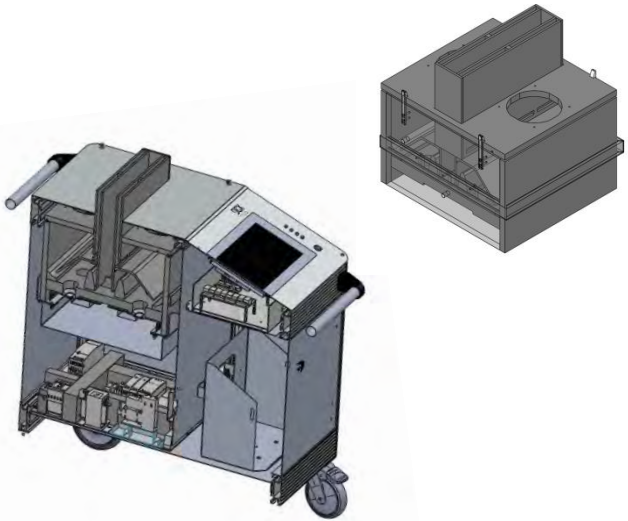
The DCX decontamination effect virus, bacteria, fungi (yeast and mold) and odor within a validable process.

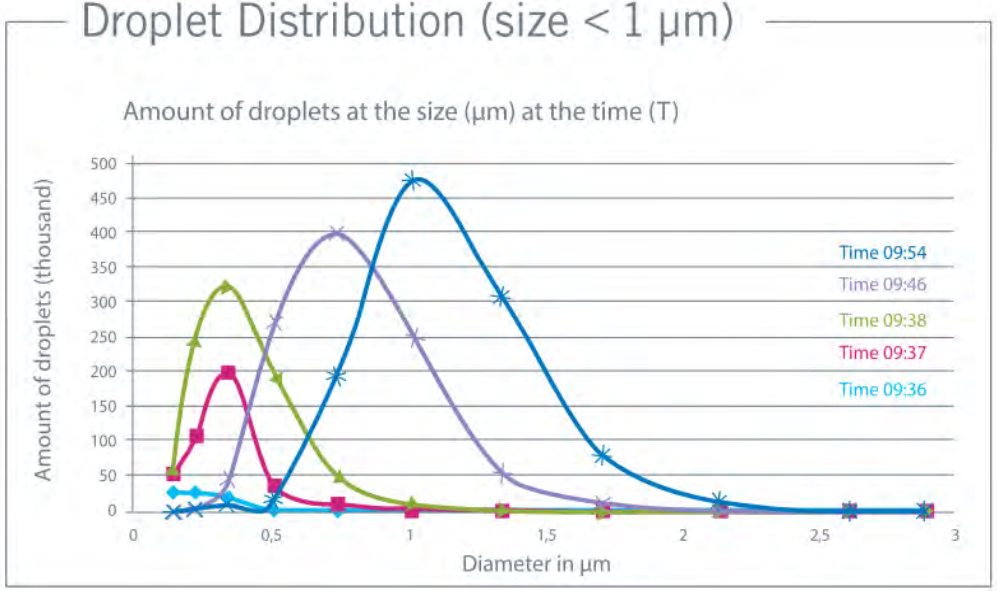
Tested microorgansims

- Staphylococcus aureus (ATCC 6538)
- Pseudomonas aeruginosa (ATCC 15442)
- Enterococcus hirae (ATCC 10541)
- Candida albicans (ATCC 10231)
- Aspergillus brasiliensis (ATCC 16404)
- Proteus mirabilis (ATCC 14153)
- Escherichia coli (NCTC 10538)
- Clostridium difficile (ATCC 700057, ATC 9689)
- Human Norovirus (HNV) (GGII.3)
- Feline calicivirus (FCV) (KS 20)
- Geobacillus stearothermophilus (ATCC12980)
- Acinetobacter XDR (Extensively drug resistant)
- ESBL (Extended-Spectrum Beta-Lactamase)
- KPC (Klebsiella pneumoniae
- Carbapenemase) ATCC–BAA 1705
- MRSA (Methicillin resistant S. aureus) ATCC 43300
- VRE (Vancomycin resistant
- Enterococcus) ATCC 51299
- …

DCXpro – inside

An insight into the compact design of the DCXpro and the H_2O_2 generator for non-condensing micro aerosol, which has been further developed and optimized for the DCXpro.



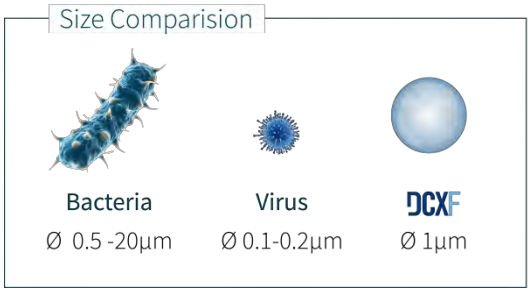


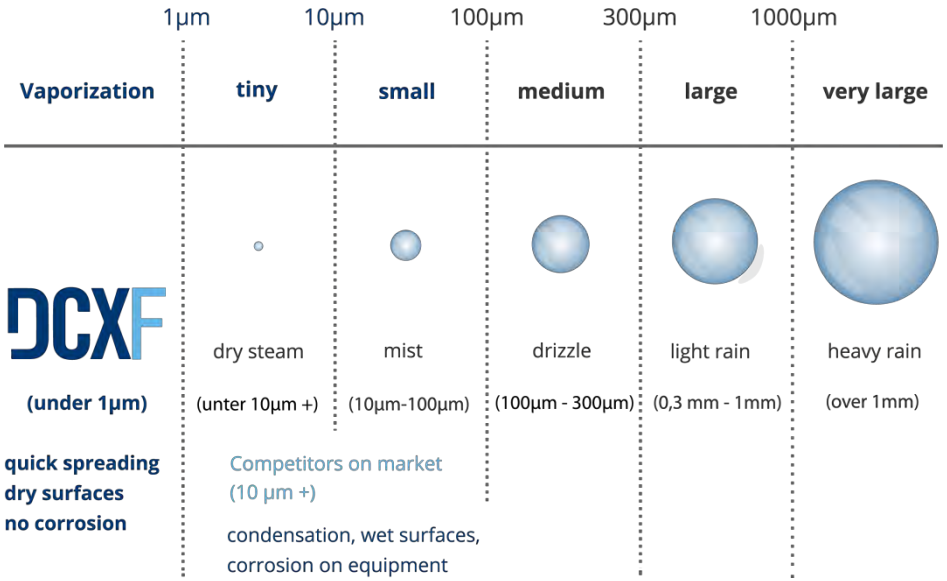
Changes in the course of technical development reserved.

DCX Technology - Small. Smaller. DCX Micro Aerosols

Size matters – our advantage!

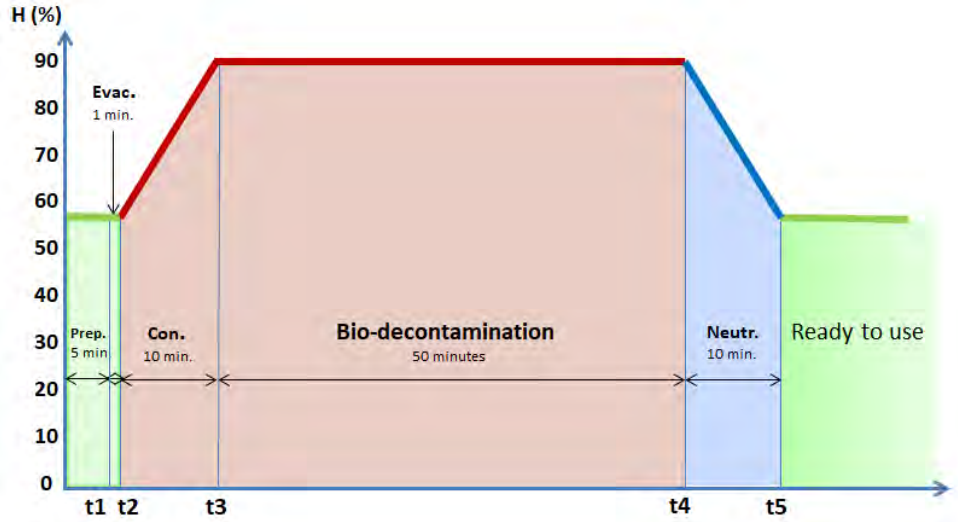
The smaller the particles the better in order to achieve a „dry decontamination“ and highest efficiency. DCX creates micro aerosols smaller than 1µm in diameter.





DCX Technology – brief description of the process

The hole process is divided in:



- Preparation*(1)* und evacuation*(2)*
- Conditioning*(3)*
- Decontamination*(4)*
- Neutralization*(5)* and room clearance

Average values for the individual phases that apply under defined conditions:

1 TBD – 5 bis 15 min
2 TBD – 1 bis 5 min
3 TBD – >10 bis 20 min
4 TBD – >30 min
5 TBD – 20 bis 60 min

Timeline / product development

	DCXF	DCXN	DCXF-AP	DCXF-25
Application areas:	Hospital Odor	Food	Parasites & insects	Fungi (yeast & mold)
				based on DCXF

2005 2007 2012 2015 2018 2020 ongoing

DCX type:

DCXpert
Roomsize 3000m³+

DCXpro
Roomsize 1500m³+

DCXplus / DCXplus (lc)
Roomsize 250m³+

Three (4) powerful systems for all your needs

efficient. innovative. safe.

DCX disinfection control extended

	DCXpert	DCXpro	DCXplus	DCXplus (Ic)
Roomsize:	3000m³+	1500m³+	250m³+	250m³+
Dimensions in mm (L/B/H):	1256 x 590 x 920	900 x 450 x 920	605 x 460 x 776,5	605 x 460 x 776,5
Weight:	appr 90 kg	appr 50 kg	appr 17 kg	appr 15 kg
Voltage:	230 V / 50 Hz	230 V / 50 Hz	12-264 V / 50/60 Hz	12-264 V / 50/60 Hz
Power consumption:	max. 600 Watt	max. 400 Watt	max. 300 Watt	max. 300 Watt
Control:	Display / remote WLAN	Display / remote WLAN	Display / remote WLAN	-- / Remote WLAN
Battery supply:	--	--	Yes / dual slot	--
Certificate:	CE EN 17272	CE EN 17272	CE/UL* EN 17272	CE/UL* EN 17272
Fluids:	F/N/-AP/-25	F/N/-AP/-25	F/N/-AP/-25	F/N/-AP/-25
Systemcheck:	-	-	on board diagnosis (ODB)	on board diagnosis (ODB)
Use for	big halls	middle rooms	smaller rooms	smaller rooms

Changes in the course of technical development reserved.

Application spectrum DCX Technology

Food

- Noroviruses
- Verotoxin-producing E. coli
- Stapylococcus aureus
- Salmonellae
- Listeria monocytogenes
- …

Hospital & Ambulances

- Staphylococcus aureus (ATCC 6538)
- Pseudomonas aeruginosa (ATCC 15442)
- Enterococcus hirae (ATCC 10541)
- Acinetobacter
- MERS
- Ebola
- …

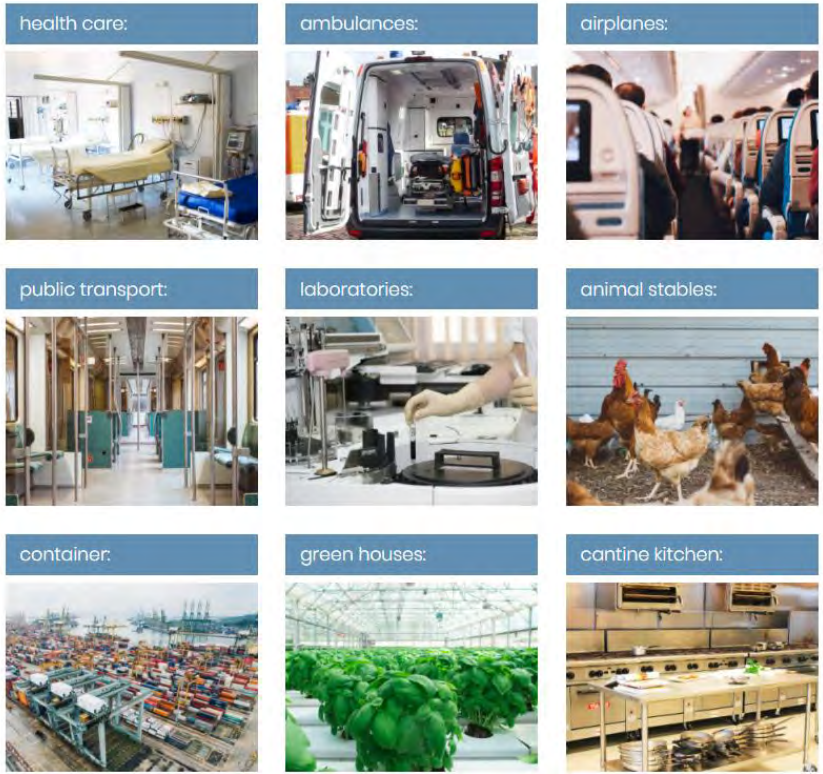
Parasites & Insects

- Bed bugs eggs
- Bed bugs nymphs
- Bed bugs
- Wide range of parasites and insects
- German cockroach (Blattella germanica)
- …

Fungi

- Aspergillus niger
- Candida albicans (ATCC 10231)
- Aspergillus brasiliensis (ATCC 16404)
- …

DCX Technology - Fields of applications



Fields of Applications

- Hospital
- Health care facilities
- Retirement homes
- Nursing homes
- Clinics
- Laboratories
- Pharmaceutical industry
- Ambulances
- Public transport
- Food industry
- Container decontamination
- Kitchens
- Schools
- Kindergarten
- Pest Control
- …

Overview – Application fields

Kindergarten, senior home

Hospitals, medical care

Vegetables, fruit, cocoa beans, Packaging / containers

Overview – Application fields

Intensiv care unit

Ambulance

sleeping wagon

DCX Technology - DIN EN 17272

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DCX disinfection control extended

In several tests it was proven that a high level of humidity in combination with large size of aerosols in the air during a room nebulization do not lead to the desired results.

It is precisely these parameters that are optimally controlled with the patented DCX technology.

Tests in neutral accredited laboratories have shown that the germ reduction with DCX dry nebulization is up to log 10^8 levels (within 24 hours*), i.e. significantly higher than with conventional room desinfection methods, such as wipe disinfection.

* The long test duration was deliberatly chosen in order to provide evidence of dry nebulization, even longer periods of time

DCX Technology - DIN EN 17272

The results of the DCX dry nebulization are outstanding. Among other things, the folowing germs were tested and a germ reduction was achieved:

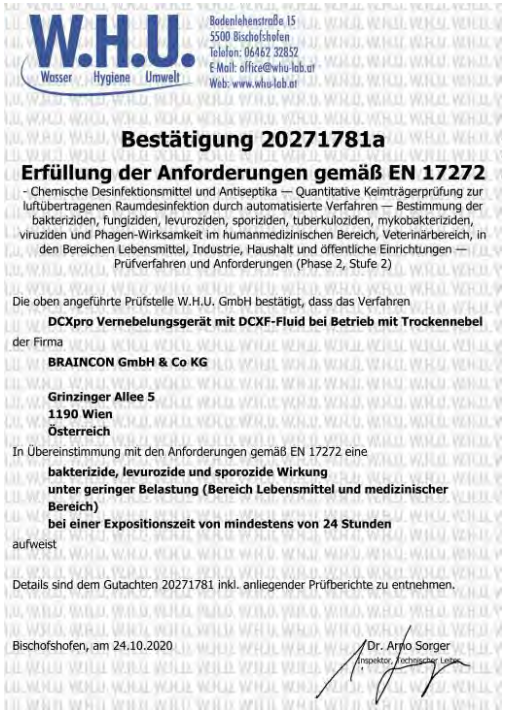
Test validations

Aufgrund der geänderten Auswertung sind für die Versuchsvalidierungen nur N_1 und n_1 relevant (die Daten stammen vom jeweiligen Prüftag).

MO-Stamm	N_1	n_1	**condition N1 / n1 > 0,5 fulfilled**
S. aureus	$4{,}7 \times 10^8$	$3{,}6 \times 10^8$	Ja
E. hirae	$3{,}1 \times 10^8$	$3{,}0 \times 10^8$	Ja
E. coli	$7{,}2 \times 10^8$	$5{,}2 \times 10^8$	Ja
P. aeruginosa	$8{,}2 \times 10^8$	$8{,}2 \times 10^8$	Ja
A. baumannii	$3{,}2 \times 10^8$	$1{,}9 \times 10^8$	Ja
C. albicans	$7{,}0 \times 10^7$	$5{,}6 \times 10^7$	Ja
B. subtilis	$4{,}5 \times 10^6$	$4{,}2 \times 10^6$	Ja

DCX Technology - DIN EN 17272

The DCX nebulization technology is certified according to the European test standard DIN 17272.



W.H.U. Wasser Hygiene Umwelt

Bodenlehenstraße 15
5500 Bischofshofen
Telefon: 06462 32852
E-Mail: office@whu-lab.at
Web: www.whu-lab.at

Bestätigung 20271781a

Erfüllung der Anforderungen gemäß EN 17272

- Chemische Desinfektionsmittel und Antiseptika — Quantitative Keimträgerprüfung zur luftübertragenen Raumdesinfektion durch automatisierte Verfahren — Bestimmung der bakteriziden, fungiziden, levuroziden, sporiziden, tuberkuloziden, mykobakteriziden, viruziden und Phagen-Wirksamkeit im humanmedizinischen Bereich, Veterinärbereich, in den Bereichen Lebensmittel, Industrie, Haushalt und öffentliche Einrichtungen — Prüfverfahren und Anforderungen (Phase 2, Stufe 2)

Die oben angeführte Prüfstelle W.H.U. GmbH bestätigt, dass das Verfahren

DCXpro Vernebelungsgerät mit DCXF-Fluid bei Betrieb mit Trockennebel

der Firma

BRAINCON GmbH & Co KG

Grinzinger Allee 5
1190 Wien
Österreich

In Übereinstimmung mit den Anforderungen gemäß EN 17272 eine

bakterizide, levurozide und sporozide Wirkung
unter geringer Belastung (Bereich Lebensmittel und medizinischer Bereich)
bei einer Expositionszeit von mindestens von 24 Stunden

aufweist

Details sind dem Gutachten 20271781 inkl. anliegender Prüfberichte zu entnehmen.

Bischofshofen, am 24.10.2020

Dr. Arno Sorger
Inspektor, Technischer Leiter

W.H.U. Wasser Hygiene Umwelt

Laboratorium für Wasseruntersuchungen und Hygiene

W.H.U. GmbH Bodenlehenstraße 15, 5500 Bischofshofen, Österreich

BRAINCON GmbH & Co KG

Grinzinger Allee 5
1190 Wien
Österreich

Bischofshofen, 03.11.2020

Gutachten 20271782

DCXpro Vernebelungsgerät mit DCXF-Fluid

Prüfung gemäß EN 17272 - Chemische Desinfektionsmittel und Antiseptika — Quantitative Keimträgerprüfung zur luftübertragenen Raumdesinfektion durch automatisierte Verfahren — Bestimmung der bakteriziden, fungiziden, levuroziden, sporiziden, tuberkuloziden, mykobakteriziden, viruziden und Phagen-Wirksamkeit im humanmedizinischen Bereich, Veterinärbereich, in den Bereichen Lebensmittel, Industrie, Haushalt und öffentliche Einrichtungen — Prüfverfahren und Anforderungen (Phase 2, Stufe 2)

Dieses Gutachten ist eine Erweiterung der Aussage des Gutachtens 20271781. Details zu den Prüfungen und den Prüfergebnissen sind diesem Gutachten zu entnehmen.

Zusammenfassung

Das Vernebelungsverfahren mit dem Vernebelungsgerät DCXpro und dem vernebelten Desinfektionsmittel DCXF-fluid führt unter geringer Belastung bei Betrieb mit Trockennebel bei einer Expositionszeit von mindestens 24 Stunden zu einer ausreichenden bakteriziden, levuroziden und sporoziden Wirkung sowohl im Bereich Lebensmittel als auch im medizinischen Bereich. Unter den gleichen Bedingungen wirkt ein Betrieb mit feuchtem Nebel nicht ausreichend mikrobiozid.

Dr. Arno Sorger
Technischer Leiter

Ergeht an: Auftraggeber

DCX Technology – case study “rehabilitation clinic ENNS”

REHAKLINIK ENNS

Typical disinfection results with use of DCX technology in hospital environment

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Decontamination of a patient room:

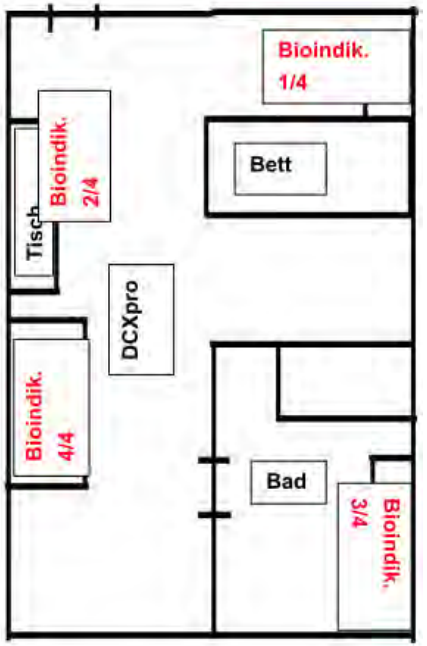
Patient room

Position of the DCX in the patient room

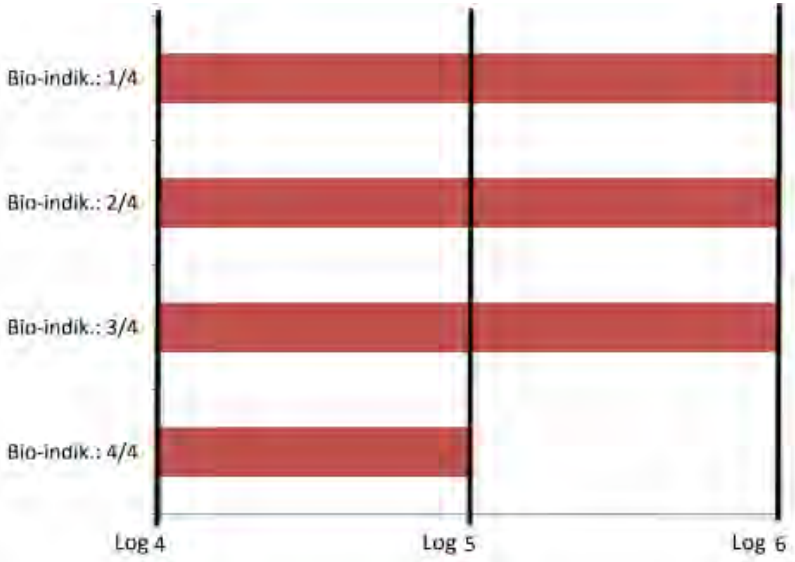
Bathroom

DCX Technology – case study “rehabilitation clinic ENNS”

Decontamination of a patient room / position of the bio indicators & results:



Sketch of the patient room



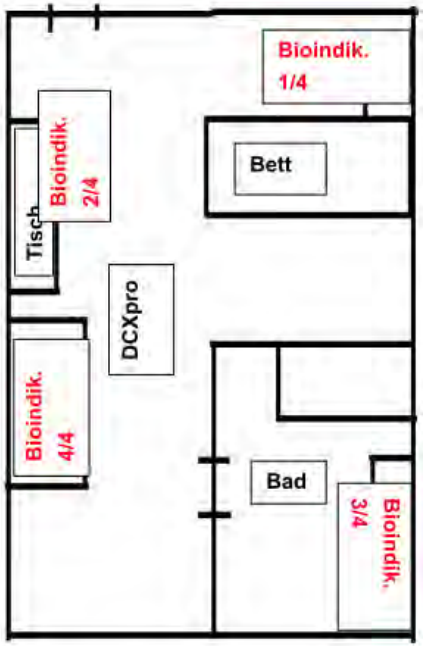
Evaluation of bio indicators / bar chart

External test center:

Laboratory Dr. Mustafa
Medical diagnostic laboratory
Vienna / Austria

DCX Technology – case study “rehabilitation clinic ENNS”

Decontamination of a patient room / position of the bio indicators & results:



Sketch of the patient room

Analysen von Geobacillus stearothermophilus
Bioindikatoren

Auftraggeber:

Fa.Braincon GmbH & Co KG
Grinzinger Allee 5
Wien
1190

Ansprechpartner:

Proben erhalten am: 30.01.2020

Proben inkubiert bei 55-60°C:
von: 30.01.2020 18.43
bis: 03.02.2020 09:10

Ergebnisliste:

Bezeichnung/Codierung	Log4	Log5	Log6
Rehaklinik ENNS 30.01.19 1/4	negativ	negativ	negativ
Rehaklinik ENNS 30.01.19 2/4	negativ	negativ	negativ
Rehaklinik ENNS 30.01.19 3/4	negativ	negativ	negativ
Rehaklinik ENNS 30.01.19 4/4	negativ	negativ	WACHSTUM
NK offen und zu	negativ	negativ	
Positiv Kontrolle eg 31./ikb 31.1.21 00	WACHSTUM	WACHSTUM	WACHSTUM
NK offen	negativ		

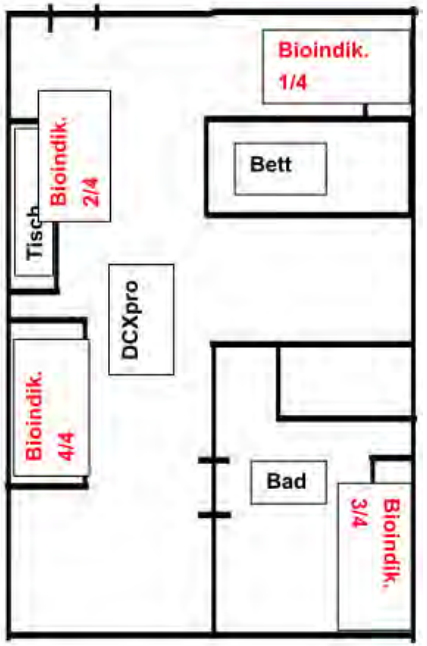
Evaluation report bio indicators from Labor Mustafa / Vienna

External test center:

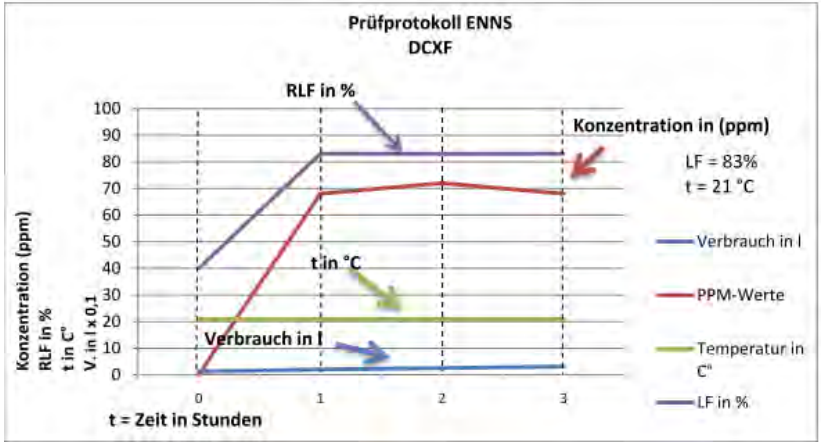
Laboratory Dr. Mustafa
Medical diagnostic laboratory
Vienna / Austria

DCX Technology – case study “rehabilitation clinic ENNS”

Decontamination of a patient room / position of the bio indicators & results:



Sketch of the patient room



Graphic display of the PPM values (concentration values), temperature (C), consumptions (liters) and humidity (%)

	Nach 1 Std.	Nach 2 Std.	Nach 3 Std.
RLF in %	83%	83%	83%
PPM- Werte	68	72	67
Temperatur in °C	21	22	21
Verbrauch in ml	2000	2500	3100

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DCX disinfection control extended

Results from the test report (contact test / graphically processed):

External test center:

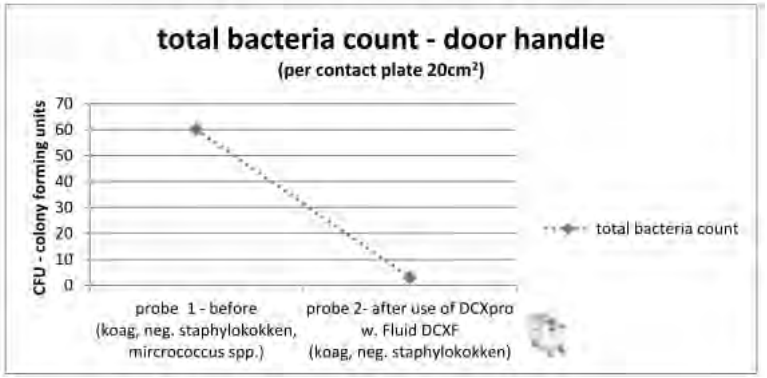
Kepler University Hospital / Austria Hygiene Center

Institute for pathology and Microbiology / Medcampus III

3.7.1 Door handle

Probe Nr. 1 door handle **before** room disinfection
(koag, neg. staphylokokken, mircrococcus spp.) / **60 CFU**

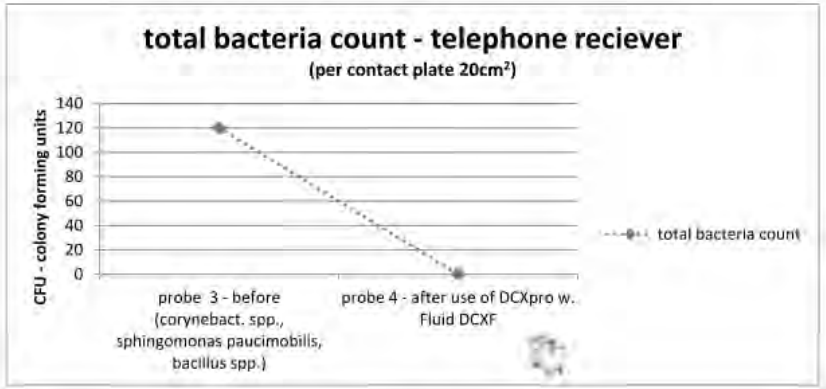
Probe Nr. 2 door handle **AFTER 3 HOURS** room disinfection
after use of DCXpro w. Fluid DCXF (koag, neg. staphylokokken) / **3 CFU**



3.7.2 Telephone reciever

Probe Nr. 3 telephone reciever **before** room disinfection
(corynebact. spp., sphingomonas paucimobilis, bacillus spp.) / **120 CFU**

Probe Nr. 4 telephone receiver **AFTER 3 HOURS** room disinfection
after use of DCXpro w. Fluid DCXF / **0 CFU**



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DCX disinfection control extended

Results from the test report (contact test / graphically processed):

External test center:

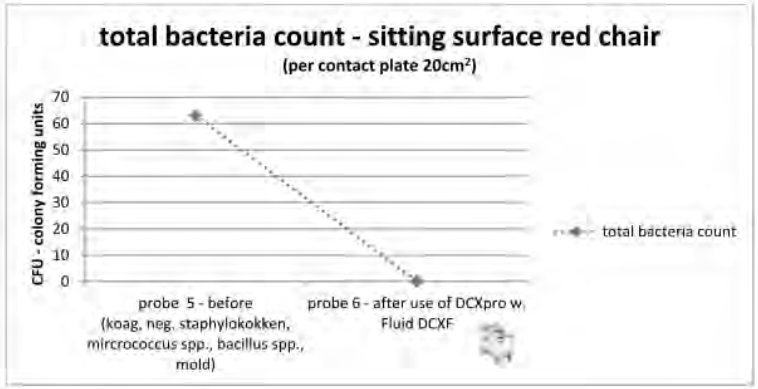
Kepler University Hospital / Austria Hygiene Center

Institute for pathology and Microbiology / Medcampus III

3.7.3 Sitting surface red chair

Probe Nr. 5 sitting surface red chair **before** room disinfection
(koag, neg. staphylokokken, mircrococcus spp., bacillus spp., mold) / **63 CFU**

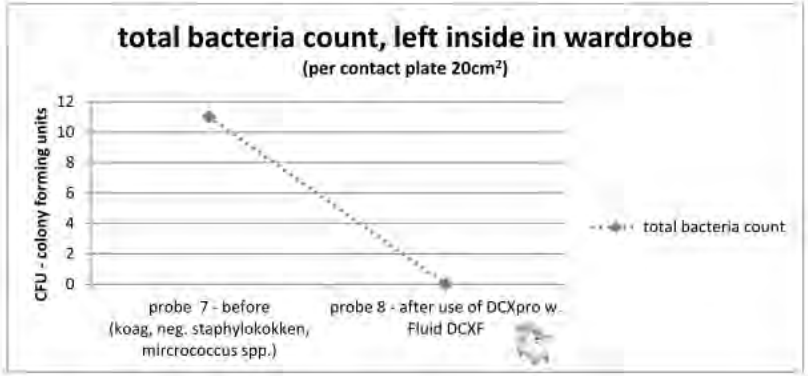
Probe Nr. 6 sitting surface red chair **AFTER 3 HOURS** room disinfection
after use of DCXpro w. Fluid DCXF / **0 CFU**



3.7.4 Left side in wardrobe

Probe Nr. 7 left side in the box **before** room disinfection
(koag, neg. staphylokokken, mircrococcus spp.) / **11 CFU**

Probe Nr. 8 left side in the box **AFTER 3 HOURS** room disinfection
after use of DCXpro w. Fluid DCXF / **0 CFU**



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DCX disinfection control extended

Results from the test report (contact test / graphically processed):

External test center:

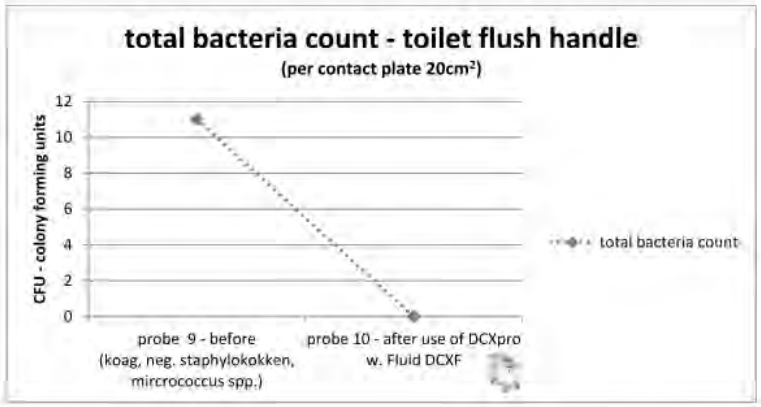
Kepler University Hospital / Austria Hygiene Center

Institute for pathology and Microbiology / Medcampus III

3.7.5 Toilet flush handle

Probe Nr. 9 toilet flush handle **before** room disinfection (koag, neg. staphylokokken, mircrococcus spp.) / **11 CFU**

Probe Nr. 10 toilet flush handle **AFTER 3 HOURS** room disinfection after use of DCXpro w. Fluid DCXF / **0 CFU**



DCX Technology – Fight against nosocomial infections – (example Norovirus)

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DCX disinfection control extended

The Impact Of A Hydrogen Peroxide Vapour Based Decontamination Method On The Infectivity and Detectability of Feline Caliciviruses as Surrogates for Human Noroviruses

Susanne Fister [1] , Franz Allerberger [2] , Martin Wagner [3] and Peter Rossmanith [1, 3] *(peter.rossmanith@vetmeduni.ac.at)

[1] Christian Doppler Laboratory for Monitoring of Microbial Contaminants; University of Veterinary Medicine, Veterinärplatz 1, 1210 Vienna, Austria
[2] Austrian Agency for Health and Food Safety (AGES), Spargelfeldstraße 191, 1220 Vienna, Austria
[3] Institute for Milk Hygiene, Milk Technology and Food Science, Department for Farm Animals and Public Veterinary Health, Vienna, Austria

DCX Technology – Fight against nosocomial infections – (example Norovirus)

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INTRODUCTION

Human noroviruses are a leading cause of gastroenteritis worldwide and effective decontamination following an outbreak is crucial to avoid recurrent outbreaks. Recently hydrogen peroxide vapour has been shown to be a suitable decontamination system. The aim of this study was to test a decontamination device (DCXpert®) in complete rooms, based on hydrogen peroxide micro aerosol fumigation. As noroviruses are caliciviruses we tested the efficacy of this technology on the feline calicivirus (FCV) as surrogate by determining infectivity and detectability via RT qPCR.

RESULTS AND DISCUSSION

Infectivity

Infectivity tests showed that it was difficult to obtain clear cytopathic effects (CPE) when fumigated viruses were used for infection of CRFK cells. It could be seen that the infected cells were damaged in comparison to the not infected controls but they were not as much lysed as when non treated viruses were used (Fig. 1). Fumigated negative controls did not lead to a changed phenotyp of CRFK cells. This indicates that the CPE of the cells infected with vaporised viruses was to due to the viruses and not to residues of vaporization.

$TCID_{50}$- determinations could be made from both types of tiles treated for 60 minutes and the ceramic tile fumigated for 120 minutes. A reduction in infectivity of 2 – 3 log_{10} was observed (see Fig 2). FCVs on PVC tiles that were treated for 120 min did not show CPE. None of the viruses treated with H_2O_2 were able to produce plaques.

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AGES

DCX Technology – Fight against nosocomial infections – (example Norovirus)

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Detectability

It was possible to detect viruses in all samples using RT qPCR. However, there was a reduction of 3 log_{10} as a result of the 60 and 120 min treatments. Virus numbers counts on the PVC title carrier fumigated for 120 min decreased by 4 log_{10}.

Detectionlimit

Both PCR and $TCID_{50}$ data show a reduction of virus numbers on the not treated process control tiles of at least 0.5 log_{10} compared to the starting concentration (data not shown). This indicates a reduction of virus numbers during the processing caused by drying, elution and transport.
This and the use of only 100 µl sample for PCR and titer determination led to a detection limit of a maximum reduction of 3 log_{10} using $TCID_{50}$ determination and 4 log_{10} using PCR.

Fig.1: Cells after treatment with fumigated viruses (B). (A) shows cells 'infected' with process negative control and (C) cells after infection with non treated viruses are shown.

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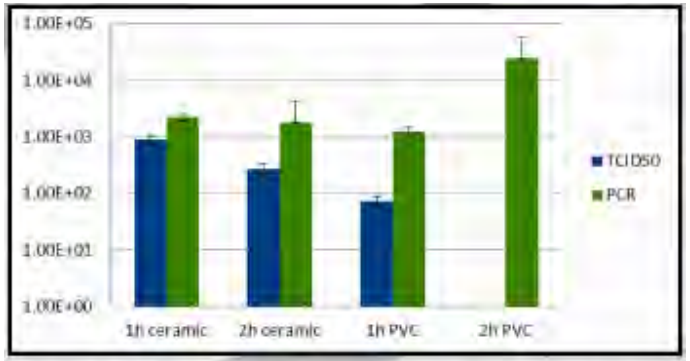

Fig.2: Log10 Reduction of FCV after DCXpert® Treatment. $TCID_{50}$ determinations showed that no infective viruses were observed after two hours fumigation on PVC.

DCX Technology – Fight against nosocomial infections – (example Norovirus)

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DCX disinfection control extended

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CONCLUSION

While $TCID_{50}$ values and PCR data cannot be compared directly, both methods revealed reduced counts of feline caliciviruses by at least 2 log_{10} following DCXpert® fumigation when titer determinations were done or 3 log_{10} when quantification was done by PCR. These observations are in agreement with other studies which have investigated hydrogen peroxide decontamination and which showed a slightly higher reduction (e.g. Bentely et al. 2012: - 4 log_{10}).

MATERIAL AND METHODS

Experimental procedure

PCV- and ceramic tiles were artificially contaminated by 50 µl suspension of feline calicivirus or PBS as a negative control and left to dry for 30 min in a cabinet.
Afterwards the carriers were placed in a room which was decontaminated by the DCXpert® for 60 min and 120 min or left in the cabinet as process controls (all samples in duplicate).
The tiles were washed with 35 ml PBS for 30 min on a shaker to elute the viruses.
The washing solution was stored on ice, transported to the laboratory and used directly and in ten-fold dilutions for titer determination and RNA isolation.

Determination of Infectivity

Infectivity of the viruses in the washing solution and ten-fold dilutions of it was tested by $TCID_{50}$-determinations and plaque assays using confluent layers Crandell-Reese feline kidney (CRFK) cells.
Detectability by RT qPCR
To test detectability, 100 µl of the washing solution was used for RNA isolation and subsequent RT-qPCR.

Calculation of virus reduction

Drying, elution and transport can lead to a reduction of viruses. Therefore the effect of the DCXpert® was calculated in comparison to the non fumigated process controls. $TCID_{50}$ values / ml were multiplied with 0.7 the get PFU / ml.

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This study demonstrates the effect of cold nebulized H_2O_2 on murine norovirus (MNV) on fruit and vegetable surfaces and shows the potential for the food industry.

Dabisch-Ruthe, M., Weinstock, M., Pfannebecker, J., Becker, B., Life Science Technologies, Microbiology, University of Applied Sciences, D-32657 Lemgo, Germany

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This study demonstrates the effect of cold nebulized H_2O_2 on murine norovirus (MNV) on fruit and vegetable surfaces and shows the potential for the food industry. Infective MNV were reduced by
approximately 4 log 10 on smooth surfaces (apples, blueberries). Treatment of artificially contaminated cucumbers resulted in lower
virucidal efficiency, whereas a reduction of 1.9log_{10} was determined.
The treatment of inoculated strawberries resulted in no reliable reduction rates of MNV. First steps for the application of cold misted
H_2O_2 in the food industry were demonstrated in this study and the
fundamental effectiveness of the procedure was shown.

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Usage of cold hydrogen peroxide vapour for inactivation of murine norovirus on fruit and vegetable surfaces

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Introduction

In 2017 15 outbreaks of human norovirus (hNV) in fruit and vegetables were reported in the Rapid Alert System for Food and Feed Portal (https://ec.europa.eu/food/safety/rasff_en). For research investigations, surrogates as murine norovirus (MNV) are utilized for studying norovirus infection due to the lack of a cell culture for hNV. It is known that hydrogen peroxide vapour (H_2O_2) can be utilized as cold fog (nebulization at room temperature) in order to inactivate MNV on surface areas. Although hNV contamination of fruit and vegetables is an ongoing problem the virucidal efficiency of this application regarding the inactivation of norovirus on different fresh produce is not characterized.

Materials and Methods

The DCXpert system (DCX Technologies GmbH) and the Diosol Generator MF (DIOP GmbH & Co. KG) (Fig.1) were applied for cold fogging decontamination with H_2O_2 (19 % H_2O_2, 60 min). MNV (S99 P19) was used in order to illustrate if cold nebulized H_2O_2 inactivates the virus on different fruit and vegetable surfaces (apples, blueberries, cucumbers, strawberries).

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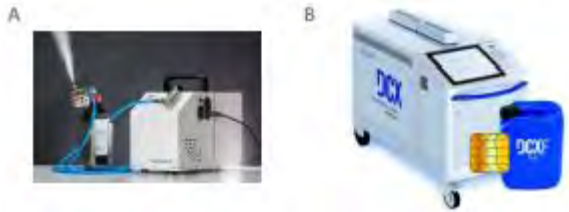

Fig.1: Two different application systems for nebulization of cold H_2O_2. A: Diosol Generator MF (DIOP GmbH & Co. KG). B: DCXpert (DCX Technologies GmbH).

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After H_2O_2 treatment spiked MNV was recovered from untreated and treated fresh products according to DIN EN ISO 15216-2. Plaque assays were performed after recovery of MNV to compare the quantity of infective MNV.

Fig.2: Fruit and vegetables used in this study (A). Recovery of MNV from cucumber surface (B).

Results

Infective MNV were reduced on smooth surfaces (apples, blueberries) by approximately 4 $\log_{10}$ with cold nebulized H_2O_2 (19 % H_2O_2, 60 min, max. 260 ppm H_2O_2). Cucumbers were chosen as additional vegetable for this study to show the reduction rate due to cold misted H_2O_2 procedure of infective MNV on hard surfaces, because they are more structured than apples and blueberries. However, similar treatment of artificially contaminated cucumbers resulted in lower virucidal efficiency of this application, whereas a median value of 1.9 $\log_{10}$ reduction can be determined (0.6 $\log_{10}$ up to 2.8 $\log_{10}$).

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Strawberries were used as an example of soft berry fruit with a rougher exterior and inoculated with MNV on the surfaces. There was no reproducible reduction rate of infectious MNV after treatment with 214 ppm of aerosolized H_2O_2. However, recovery of MNV from untreated strawberries varied between 2.5×10^4 and 1.4×10^7 PFU/mL. The reductions measured during treatment varied between 0.1 and 2.8 $\log_{10}$ PFU/mL (Fig.3).

In particular, the influence of H_2O_2 treatment on the color of the fruit was considered. No color differences were detected of apples, blueberries, cucumbers and strawberries due to treatment with H_2O_2 for 60 min.

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Details on this study: Weinstock et al., 2018: Inactivation of murine norovirus on fruit and vegetable surfaces by cold nebulized hydrogen peroxide. Food Microbiology. Under review.

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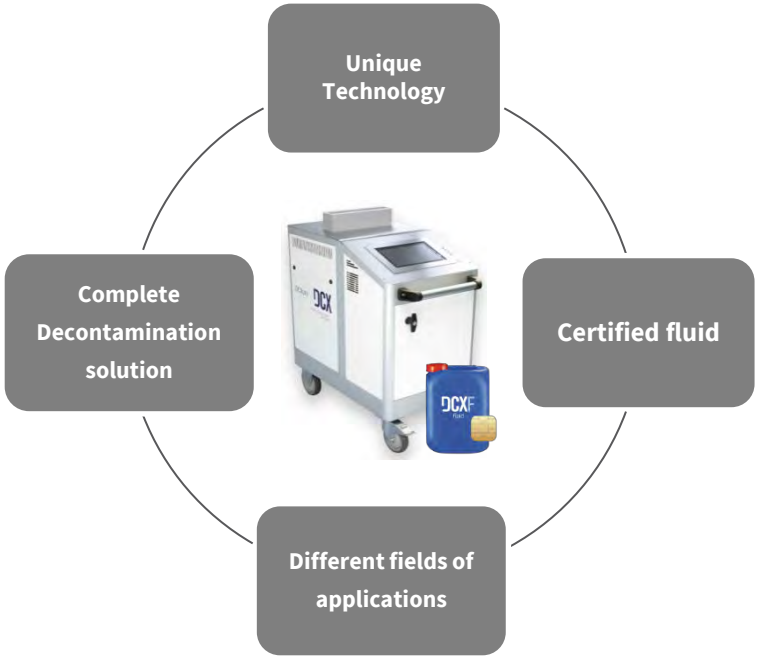

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- Most effective and economic decontamination based on “dry” micro-aerosols
- Patented technology which was successfully tested multiple times.
- Endorsed by leading hygiene experts e.g.: using DCX to decontaminate after Ebola at the official Ebola-Training, AGES Vienna
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