

# Before we start...

You may be wondering why a veterinarian will give a presentation dealing with aircraft (especially cleaning and disinfection), airworthiness and other related topics - here is the answer...

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Veterinärwesen

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In collaboration with:

Lufthansa Cargo AG,  
Lufthansa AG,  
Lufthansa Technik AG



Identifying and testing  
suitable and safe aircraft  
disinfectants  
for use on  
cargo planes that transport  
animals

# Statistics/Risks/Challenges (2018)

Airport Frankfurt

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	Shipments	Number of animals
<b>Total</b>	<b>20,568</b>	<b>330,398,962</b>
Pigs	39	461
Cattle	5	34
Poultry	310	3,937,981
Ornamental fish, fish eggs	6,247	72,592,935
Rodents	3,962	441,468

# Other animals

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Horses, sheep, alpacas, goats, wild claw animals,  
birds, dogs, cats, ferrets, foxes, rabbits, hares,  
monkeys, reptiles, amphibians, embryos, bees,  
bumble bees, arachnids, other mammals, insects,  
ticks, mites, leeches, fishing worms...

# The challenge is...

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Millions of animals are transported around the world.

Although appropriate veterinary checks are in place, the risk of spreading undetected diseases, particularly a new and emerging disease (see coronavirus/Wuhan), always remains.

Yet there is no global standard procedure to deal with the problem of cleaning and disinfecting cargo planes that transport animals especially in the case of an animal disease on board.

Animal diseases of major importance...(mostly with obligation to notify but also sometimes only reportable diseases)

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Foot and mouth disease (FMD)

African swine fever (ASF)

Avian influenza (AI)

Classical swine fever (CSF)

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Ebola

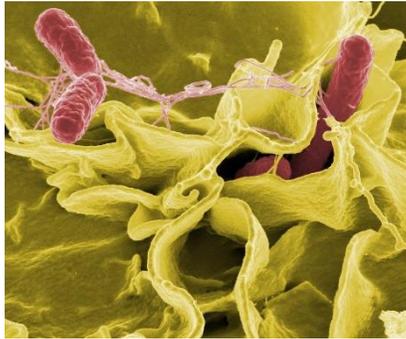
Anthrax

Rabies

New and emerging diseases

# Pathogens

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**Viruses**  
**Bacteria**



**(Fungi/Yeasts)**



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**(Prions)**



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# Tenacity

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The knowledge of the survivability of pathogens is particularly relevant in the context of an animal disease on board of a transport aircraft: A profound and detailed knowledge of the basic conditions of pathogenic mechanisms of action enables an adequate and precise risk assessment and is a prerequisite for the assessment of the necessity of appropriate measures.

# Continued...

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On the other hand, knowledge about resistance enables the correct selection of the disinfectant as well as the determination of further parameters (concentration, temperature, exposure time, etc.)

# Other properties of importance

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Zoonotic potential?

Dose of infection (one or more infectious particles necessary to initiate infection)

Spread by aerosol?

If you have no idea what to do next...the airplane might be grounded for an extended period of time!

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# Airworthiness

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The implementation of adequate cleaning and disinfection is challenging in itself, but is made considerably more difficult by the requirement to ensure airworthiness of the transport aircraft.

# Disinfectant testing

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Tests relevant to material compatibility and safety in Boeing Specification D6-7127

The disinfectant, aircraft, general purpose test (AMS 1452)

Total immersion corrosion test for aircraft maintenance chemicals (American Society for Testing Material [ASTM] F483)

# Continued...

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Stress Cracking On Acryl Plastics in contact with liquid or semi-liquid compounds (ASTM F484)

Rubber Test

The tests relevant to material compatibility and safety in the Federal Aviation Administration (FAA)/EASA rules (FAR/CS 25 Appendix F)

# Extremely corroded lavatory floor fitting

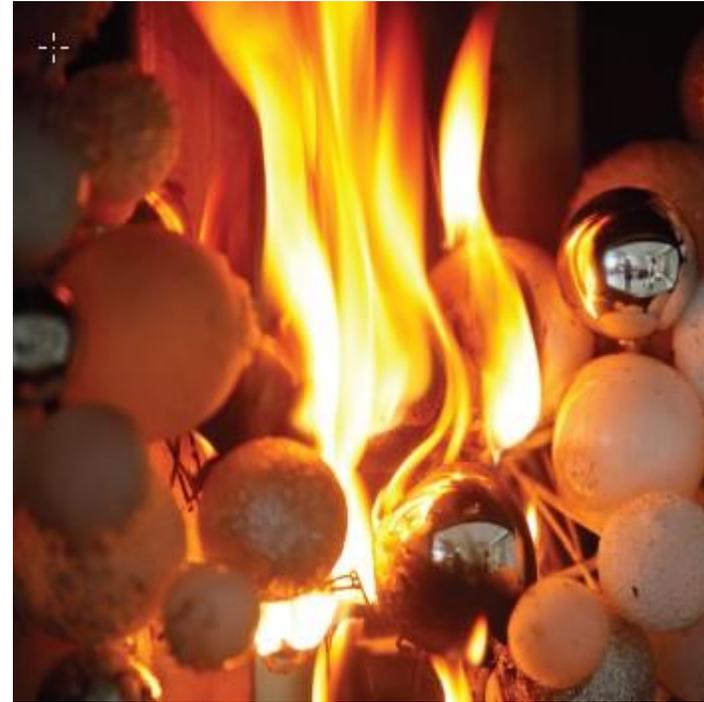


# Materials tested



# Flammability testing

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# Is there a solution?

## Aldasan<sup>®</sup> 2000

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- Formaldehyde-glutaraldehyde-based agent
- But – more than one application results in the ablation of magnesium
- Should therefore be used only as a single application (scrub-wipe)
  - A) Basic cleaning
  - B) Disinfection
  - C) Neutralization
- do not use as aerosol! – if needed (depending on the disease/causative agent) Dismozon<sup>®</sup> plus (oxygen releasing agent) can be used as aerosol

# Aldasan<sup>®</sup> Specs.

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## **Composition**

100 g contain:

9.8 g formaldehyde, 9.9 g glutaraldehyde

## **Fields of application**

For all bacterial (incl. Tbc), viral and skin fungal infections for disinfection and cleaning of surfaces, inventory and instruments in one step.

# Station Emergency Response Plan (SERP)

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The results achieved by this work and procedures themselves are available at Lufthansa and Lufthansa Cargo destinations worldwide, published in the **SERP**.

**SOPs** are freely available in a document on board of Lufthansa and Lufthansa Cargo aircrafts and can be downloaded using the following QR code:



# The result of the disinfection procedure must in any case meet the requirements of the Competent Authorities (Veterinary Services)

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How can you be sure? (Verification of disinfection)

- Test specimens e.g. *Geobacillus stearothermophilus* (containing endospores) or if available comparative specimens with similar tenacity as the agent in question.
- Sentinel animals???
- PCR???



**Thank you for  
your attention!**