

ATA 25 Equipment / Furnishings

August 27, 2020

## Cleaning and Disinfecting Aircraft Interiors

F10	F20	F200	F50	Falcon 900					Falcon 2000								Falcon 7X	
	-	-5	-	EX	-	EX	EASy	DX	LX	-	EX	EASy	DX	LX	S	LXS	7X	8X
☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒

REVISION	DATE	DESCRIPTION
0	Mar 12, 2020	Original Publication – EASA SIB 2020-02R2
1	Apr 27, 2020	Information on cleaning and disinfecting aircraft interiors in accordance with aviation authorities official guidance material
2	Aug 27, 2020	Additional disinfectants

### 1. Sources of information

- World Health Organization (WHO):  
<https://www.who.int/emergencies/diseases/novel-coronavirus-2019>
- International Air Transport Association (IATA) 3.1.  
<https://www.iata.org/en/programs/safety/health/diseases/#tab-2>
- European Center for Disease Prevention and Control (ECDC):  
<https://www.ecdc.europa.eu/en/news-events>  
Disinfecting products: <https://www.ecdc.europa.eu/en/publications-data/interim-guidance-environmental-cleaning-non-healthcare-facilities-exposed-2019>
- European Aeronautical Safety Agency (EASA) Safety Information Bulletin (SIB):  
<https://ad.easa.europa.eu/ad/2020-02R4>
- National Business Aviation Association (NBAA) COVID-19 page:  
[http://www.nbaa.org/Aircraft Operations/Safety/ Coronavirus Disease 2019 \(COVID-19\)](http://www.nbaa.org/Aircraft%20Operations/Safety/Coronavirus%20Disease%202019%20(COVID-19))
- US Government Center for Disease Control and Prevention (CDC):  
<https://www.cdc.gov/coronavirus/2019-ncov/about/prevention-treatment.html>  
<https://www.cdc.gov/quarantine/air/managing-sick-travelers/ncov-airlines.html>

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## 2. Cleaning Procedures

Disinfecting agents are more efficient when applied on dry and clean surfaces.

The following cleaning tasks are available in the Aircraft Maintenance Manual:

	FALCON 50/ 900/ 2000/ 7X/ 8X	FALCON 10/ 20/ 20-5/ 200
Cleaning of the Display Units	31-60-13-160-801 (screen cleaner used full strength)	
Cleaning of the Head-Up Display system	34-31-00-100-802	
Cleaning of windshields & windows	56-00-00-100-801	56-00-00-3 (F10) 56-00-7 (F20)
Cleaning of oxygen masks	35-10-05—100-801 (crew)	35-10-20-7 (F20: crew) 35-20-20-7 (F20: passenger) 610-0 (F200: crew) 620-0 (F200: portable)

## 3. Cabin Disinfecting Products

Aircraft operators should inform crew members regarding the general disinfecting procedures to be applied in the cockpit and cabin. Crew members should also be provided with sufficient and appropriate disinfectants to avoid crew members using their own self-provided disinfection products which may harm materials.

Additionally this will avoid possible chemical reactions between different disinfecting agent residues, which could have corrosive effects on the materials and adverse effects on crew and passenger health.

- For cockpit instruments:

Due to the delicate nature of cockpit equipment, instruments and displays:

- Avoid spraying disinfectants directly on the cockpit equipment, instruments and displays
- Use sanitizing wipes or spray liquid disinfectant on a soft cloth.

- For cabin disinfection :

- Aerosols projected by a fogging machine may be used, but only in the cabin and the baggage compartment (on condition that the chemical composition is compliant with the recommendations below). No aerosol product shall be projected using a fog machine into the cockpit.
- In addition, Dassault recommends that all of the glass cabin surfaces be dried immediately following disinfection.

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The following table contains the approximate volume of the respective Falcon cabins, including the baggage compartment:

10 SERIES	20 SERIES	50 SERIES	900 SERIES	2000 SERIES	7X	8X
8 m3/ 290 cu ft	20 m3/ 706 cu ft	30 m3 / 1060 cu ft	40 m3/ 1413 cu ft	33 m3 / 1165 cu ft	48 m3 / 1695 cu ft	52 m3 / 1836 cu ft

Dassault recommends the use of alcohol-based disinfectants and only isopropanol-based (also named isopropyl alcohol-based) disinfectants. The other type of alcohol-based disinfectants (n-propanol-based and ethanol-based disinfectants) are not authorized.

The Falcon Consumable Products Manual (CPM) references the AMS1452 RTU disinfectant by Zep Industries.

For cockpit and cabin materials (excluding displays), Dassault only recommends the use of isopropanol/isopropyl alcohol-based disinfectants with an alcohol concentration between 60 and 80%.

For cockpit and cabin displays, you can refer to the attached Honeywell Service Information Letter D202004000758 entitled "Alternate cleaning solution usage in flight deck". Otherwise, Dassault only recommends the use of isopropanol/isopropyl alcohol-based disinfectants with an alcohol concentration lower than 50%, which will clean but does not properly disinfect.

The disinfected areas must then be ventilated for 30 minutes following disinfection to allow proper evaporation of the alcohol.

If the abovementioned disinfectants are not available, Operators can reference the disinfectant Technical Data Sheet (TDS) and Material Safety Data Sheet (MSDS, SDS) to verify the following:

- The product contains the abovementioned recommended disinfecting agents in the appropriate concentration.
- The product does not include strong acids (less than a pH of 4) or alkali components to limit the risk of damage on cabinetry components.

-Dassault recommends testing the disinfectant products in inconspicuous areas to ensure that there are no immediate adverse effects prior to widespread application throughout the aircraft interior.

The table hereafter provides available disinfecting products, including:

- Their international certification and nature, and composition, allowing for verification that their commercial distribution is allowed in your region
- The main disinfecting agents and their concentration:

No dedicated testing of these products has been performed on any Falcon cabin materials or furnishing so far. Therefore, Dassault cannot guarantee that the extensive use of the abovementioned products will not have unintended effects on the cabin materials. This is especially true for delicate soft good materials such as carpets, sidewalls, window shades, leather, upholstery and varnished elements in the long term. The products highlighted in yellow should be used with caution regarding the potential for corrosion on metallic elements in the cabin.

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The recommended minimum contact between surfaces and disinfecting agent is 2 min. They shall then be rinsed with clean water.

Columns 3, 4, 5 and 6 in the table below identify to which family of disinfectants each product belongs to: alcohol based, hydrogen peroxide based, chlorine based, or quaternary ammonium chloride disinfectants. Each of these agents has been recommended as efficient against the Coronavirus family.

Dassault recommends to always pick a disinfectant in the same family of disinfecting agents to avoid chemical reactions between different disinfecting agent residues. If not possible, make sure the surfaces have been cleaned or rinsed with clean water before performing disinfection.

NAME	Official Certification	Isopropyl Alcohol Based	Chlorine Based	Hydrogen Peroxide Based	Quaternary Ammonium Chloride	Composition	Recommended
Isopropyl alcohol (or Isopropanol or Propanol-2)	Yes	X				60% to 80% Isopropyl	
NETBIOKEM DSAM	Airbus qualification (CML 14-006C, CML 14-012A), Boeig qualification (D6-7127M), AMS 1526, AMS 1452, CFM2712, EN14476, EN14675					1% N(3-aminopropyl-n-dodecyl-1-3-propanediamine)	Y
SANOSIL S006	Not available			X		1- 5% Hydrogen peroxide (H2O2) 2- 0.005% Silver (Ag)	Y
SANOSIL S010	(EC) No. 1272/2008 (EC) No. 1907/2006 (REACH) EPA Registered: 84526-1			X		1- 5% Hydrogen peroxide (H2O2) 2- 0.001% Silver (Ag)	Y
Halospray/Halomist	EPA Registered: 84526-1 EPA Registered: 84526-6			X		1- 5% Hydrogen peroxide (H2O2) 2- 0.001% Silver (Ag) <i>Identical to Sanosil S010</i>	Y
99B (99 Technologies)	(EC) No. 1272/2008 (EC) No. 1907/2006 (REACH)			X		>5 <8% Hydrogen peroxide (H2O2)	Y
Vitaloxide	FAA approved EPA registered: 82972-1		X			1- 0.2% Chlorine Dioxide (ClO2) 2- 0.125% Dimethyl Benzyl Ammonium Chloride 3- 0.125% Dimethyl Ethylbenzyl Ammonium Chloride	Y
MICROSHIELD 360	EPA Registered: 1839-83 (Part 1)				X	<b>Part 1</b> - 0.105 % n-Alkyl (60% C14, 30% C16, 5% C12, 5% C18) Dimethyl Benzyl Ammonium Chloride <b>Part 2</b> - 1.0% 3 (Trihydroxysilyl) Propyldimethyl Octadecyl Ammonium Chloride	Y
Calla 1452 & 1452 RTU	AMS 1452, 1453, 1530B, 1550B NAVAIR 01-1A-509-2 EPA Registered: 1839-168				X	1- 1.09% dimethylbenzyl amonium chloride 2- 1.63% alkyl dimethylbenzyl ammonium chloride	Y
Aerodis 7127	AMS 1452, 15503-1				X	Similar Calla 1452	Y
Bacoban for Aerospace	Boeing D6-17487, Boeing D6-7127, AMS 1550B, AMS 1451B, AMS 1452B, Bombardier AW000-25-0001 Rev.2, ASTM E 2180, EN 14476, EN 1040, EN1276, EN 1275, DIN ISO EN 10993-1				X	0.25% Benzalkoniumchloride	Y
Aerocide	EPA Registered: 1677-249	X				70% Isopropyl Alcohol	Y

This FSN serves to share available information with Falcon operators. Please do not hesitate to provide your feedback regarding the use of these products. This FSN will be revised to take into account any recommendations and additional information brought forth that may be of value to Falcon operators.

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## 4. Disinfecting Guidelines

The Coronavirus can live on an inanimate object anywhere between a few hours to 9 days (on plastic). Elevated temperatures (about 30°C/85°F) shorten the life of the virus down to hours, whereas temperatures as low as 4°C/40°F increase the life of the virus up to 28 days.

High relative humidity increases the persistence of the virus

Therefore, it is recommended that extra care be used to disinfect the cabin in colder climates and, when possible, park the aircraft in a hot and dry area for at least 4 hours before performing cabin disinfection.

### PRECAUTIONS

- NOTIFY personnel outside the aircraft about ongoing disinfection activities inside the aircraft.
- OPEN the passenger door for fresh air.
- WEAR gloves and protective clothing.
- USE an appropriate mask (suitable for SARS-CoV-2) and eye protection.
- Check the Safety Data Sheet of the disinfectant you intend to use, and compare that to any disinfectants that have been used, or potentially will use to ensure no adverse reactions between products.
- For products that have a "leave behind" disinfection aspect, it is recommended to perform an ATP (Adenosine Tri-Phosphate) swab test to determine how effective the coating is at reducing the microbial load on the cabin surfaces.

### WARNINGS

- Do not let disinfectants contact your skin, eyes or mouth.
- Follow the disinfectant manufacturer's instructions.
- Get medical aid if irritation occurs.

### PROCEDURE

Follow the below recommendations to clean/disinfect the aircraft:

- Disinfectant contact time should be as indicated in the product directions (usually greater than 2 minutes)

For surfaces that do not absorb liquid substances:

- Remove the disinfectant with a clean water-moistened cloth
- Dry the surface with a clean dry cloth: Start from the top of the cabin and work down to the floor

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- Disinfect frequently touched surfaces:
  - Passenger and crew seats, cushions, armrests and backrests
  - Tables
  - Textile floor covering
  - Entertainment controls and screens
  - Windows
- Carefully clean and disinfect the lavatories including:
  - Door handle and locking mechanism, light switches
  - Faucet & sink
  - Flush switch controls & toilet seat

## 5. Aircraft water system disinfection

Guidance can be found in the AMM task 38-10-00-670-801 Sterilization of Potable Water System when available.

## 6. Aircraft air purification

As the virus can become airborne through a cough from an infected passenger, it may eventually be present in the cabin air system.

Dassault therefore recommends allowing the air to circulate in the cabin while the cabin is being disinfected, including opening all gaspers, so that air is circulating through all the ducts, vent, inlets, and gaspers.

On Falcon 7X and 8X aircraft equipped with a Cabin Air Filtration option, after review with the vendor (Donaldson), there is no specific recommendation for replacement of the filter cartridge after a disinfection.

Dassault is aware of several air and surface purification systems that are advertised to kill pathogens, allergens and Volatile Organic Compounds (VOCs). These systems can be used on the ground or installed on the aircraft, connected to the air conditioning system. They use ionization technology and generate ions which sever the pathogen's hydrogen bonds and consequently kill the pathogens.

Dassault does not endorse any ionizer systems, based on the lack of data available on their effectiveness against Coronavirus, the absence of harmful ozone or aldehydes emission, and their long-term effects on organic materials in the aircraft interior (rubber seals, o-rings, leather, hoses, etc).

This FSN will be updated as further pertinent information becomes available. Should you have any questions or require more information, please contact your Dassault Falcon Customer Service Manager or your Field Technical Representative.

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## 6. ATP Testing

Adenosine Triphosphate (or ATP) is a test that can quickly determine the number of organisms present through the detection of ATP. The ATP molecule is present in all living cells, and its presence on a surface doesn't specify which organism is present – only the number of organisms. ATP tests swabbing surfaces can quickly indicate how effective a disinfection process has been. Because of this, it is recommended, when operators/MROs are able, to perform this testing after a disinfection of the cabin.

Presented are two options by Hygiena company for operators/MRO's that want to procure their own ATP testing capabilities.

For operators/MROs that already have the ATP testing equipment for detecting fuel contamination (LuminUltra PhotonMaster II), they can order an additional kit that can test surface swabs.

Name	Part/Item Number	Comments	Links
Hygiena SystemSURE PLUS Luminometer	ASY0260/SS3	Hygiena Luminometer	<a href="https://www.hygiena.com/other-products/systemsure-plus-other.html#">https://www.hygiena.com/other-products/systemsure-plus-other.html#</a>
Hygiena Ultrasnap ATP Surface Test – 100/box	ASY0093/US2 020	Test swabs for SystemSURE PLUS Luminometer	<a href="https://www.hygiena.com/ultrasnap-food-and-beverage.html#:~:text=Surface%20ATP%20Test.%20UltraSnap%E2%84%A2%20is%20a%20user-friendly%2C%20all-in-one,accuracy%2C%20longer-lasting%20signal%20strength%2C%20and%20more%20reproducible%20results.">https://www.hygiena.com/ultrasnap-food-and-beverage.html#:~:text=Surface%20ATP%20Test.%20UltraSnap%E2%84%A2%20is%20a%20user-friendly%2C%20all-in-one,accuracy%2C%20longer-lasting%20signal%20strength%2C%20and%20more%20reproducible%20results.</a>
LuminUltra Deposit & Surface Analysis Kit	DSA-25/DSA-100	Surface Swab Analysis Kit for LuminUltra Luminometer	<a href="https://www.luminultra.com/products/dsa/">https://www.luminultra.com/products/dsa/</a>

### Frasers Aerospace - Internal Notes:

Bacoban for Aerospace only available from Frasers Aerospace

Bacoban for Aerospace 1% DL Hand Spray Application Bottle - <https://www.frasersaerospace.com/product/bacoban-for-aerospace-disinfectant/>

Bacoban for Aerospace 1% DL Pack of Wipes - <https://www.frasersaerospace.com/product/bacoban-for-aerospace-wipes/>

Bacoban for Aerospace 3% DL Fogging / Nebuliser type - <https://www.frasersaerospace.com/product/bacoban-for-aerospace-3-fogging-type/>

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