Cleaning and Disinfecting

Intoximeters Handheld Breath Testing Instruments

March 2020

INDEX

INTOXIMETERS INC.'S MISSION

To ensure that the products it sells are safe and effective, Intoximeters, Inc. relies upon all of its knowledge to provide innovative design and quality products. Intoximeters has been a leader in providing the safest breath alcohol instruments available. These products are supported by up to date operating and maintenance procedures. Additionally, as new information is made available, Intoximeters, Inc. updates its recommendations on the proper use and maintenance of its products. These updates are published and available on its website (www.intox.com)

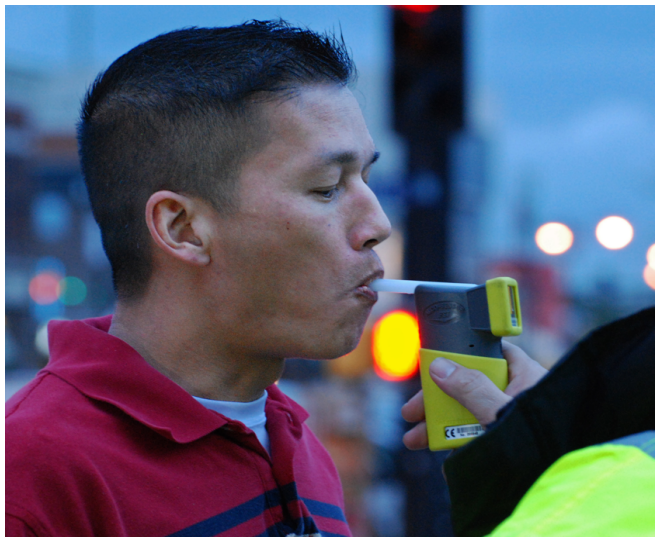
At the time of this update the threat of the Novel Coronavirus SARS-CoV-2 (the cause of COVID-19) has motivated Intoximeters, Inc. to re-assess its recommendations for proper use and maintenance of the instruments it manufactures and sells. COVID-19 is reported to be a viral disease that is often passed though airborne droplets of fluid from an infected person to another.

Intoximeters does not claim to be experts on infectious diseases and would urge its customers to seek additional direction from the proper government agencies or medical experts for questions related to the transmission of any disease (see Additional References section at the end of this document). There are, however, several commonsense steps that can be taken to reduce the likelihood of disease transmission when using a breath alcohol measurement device.

In this document, Intoximeters has set forth some general guidelines to consider for how to use, clean and disinfect the Intoximeters, Inc. handheld breath alcohol testing instruments.

Some of the suggestions in this document may conflict with information provided in manuals and other documentation previously provided by Intoximeters, Inc. Our intent is to provide the latest information available and provide recommendations for safe use of the products that we manufacture and sell. You may choose to consider this information when developing the guidelines for your program.

This document is intended to help Intoximeters 'users build their procedures for cleaning and/or disinfecting their Alco-Sensor® ("Alco-Sensor") instruments.



STEPS TO REDUCE DISEASE TRANSMISSION DURING A BREATH ALCOHOL TEST

All protocols and procedures should consider how to minimize the possibility that a subject can contract a disease in the process of providing a breath sample to a breath alcohol testing instrument. It is assumed that disease transmission could occur from either an infectious airborne microbe or an infectious microbe that was deposited on, or in the instrument from a prior subject, an operator or anyone else that has had contact with the device.

The protocol should also consider what can be done to reduce the likelihood that the operator or other handler of the instrument is exposed to an infectious disease from the subject directly, the mouthpiece, or from the instrument.

The following are methods that could be instituted to address some or all of these concerns:

- disallowing infected people from blowing into the instrument
- for instruments where the breath sample is blown into the instrument, use a mouthpiece with a check valve in it.

Another line of defense for the operator is to:

- Use protective gear when testing
  - New disposable gloves worn by the operator or maintenance technician for:
    - each subject
    - handling the mouthpiece
    - both installing it and removing the mouthpiece
    - keeping the breath or other expectorants from being deposited on the operator during a sample capture
    - keeping microbes from being transferred to the instrument or mouthpiece by the handler of the instrument and the mouthpiece
  - Use masks or respirators to avoid breathing in volatile airborne pathogens.
- Operate the instrument in a manner that the subject and operator are least exposed to possible disease transmission
  - Attaching a new clean mouthpiece for each subject

- With instruments where the breath sample is exposed to internal surfaces and a subsequent subject could inhale deposited infectious materials from that internal surface; use a one-way mouthpiece
- Removing (with disposable gloves) and disposing of the mouthpiece after each subject test sequence
- Positioning the subject, instrument and operator in a manner that the subject's breath flow is directed away from the operator.

• Take proper care to inspect, clean and/or disinfect the instruments

- Follow the directions for proper use of the cleaning product.
- If the disinfecting substance used has alcohol in it make sure the areas that you cleaned or disinfected are dry before testing the next subject. Waiting fifteen minutes after the cleaner has dried will further ensure that all volatilized alcohol has dissipated.

• Properly wash one's hands after testing a subject, handling the instrument, handling the mouthpiece or removing the disposable gloves or other protective gear.

THE DIFFERENCE BETWEEN CLEANING AND DISINFECTING

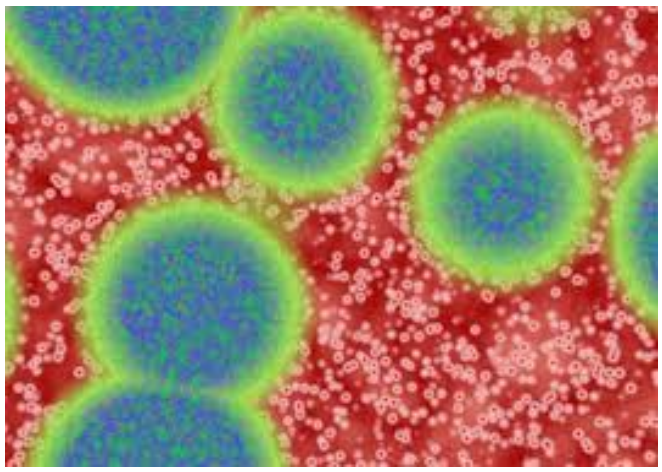
The term **"cleaning"** relates to the removal of visible particulate contamination. This may be as simple as wiping over surfaces but may involve washing and mechanically removing surface particulates. Cleaning does not kill germs, but is intended to remove them to lower the risk of disease transmission.

Once the item has been cleaned, some or all parts of the breath alcohol testing instrument may require disinfection. **"Disinfection"** is the act of applying a process to reduce the survival rate of micro-organisms on a surface. The disinfection is commonly done by using a disinfecting solution or exposing the micro-organisms to an energy source to kill the germs.

A user should strongly consider having a plan in place for cleaning and disinfecting breath alcohol testing instruments. The plan might include a risk assessment and a list of requirements for when cleaning and disinfecting are necessary.

The plan might suggest:

- When general cleaning and disinfection should occur.
- What type of events require cleaning and what type of events require disinfecting.
- How to handle devices that are believed to have been contaminated.
- What products will be used to clean and to disinfect
- The procedures for cleaning and/or disinfecting
- What gear (protective equipment) is needed to be used by the person providing the maintenance
- Practices for the person providing the maintenance to follow to reduce the likelihood of disease transmission.



THE RISK OF BREATH ALCOHOL INSTRUMENT CONTAMINATION

To date, cross-infection from Breath Alcohol Testing instruments has not been reported. However, reasonable steps should be taken to reduce the likelihood that it may occur.

An obvious potential cause for disease transmission would be if an operator failed to replace the disposable mouthpiece after a subject had completed his/her test. **New, clean mouthpieces should be used on each subject tested.**

Cross-infection via direct contact through the transfer of breath condensate, saliva and other body fluids introduce the highest risks facing the subject and operator.

Body fluids and other biological matter can be excreted through the lungs, particularly during a forced expiration, coughing or sneezing. These particles are carried by aerosolized droplets which then may be deposited in the mouthpiece or on the instrument that the subject is providing the breath sample to.

The amount of aerosolized material that will be deposited in the mouthpiece or instrument will be inversely proportional to the distance traveled from the mouth. The greatest amount of deposited material will be close to the mouth and what is deposited will lessen the further it travels away from the mouth. For this reason, the removal of the mouthpiece will eliminate the vast majority of, if not all of the deposited material.

With instruments where the breath flow is directed through the instrument, it is recommended that a delay of at least five minutes be allowed between test subjects because it has been shown by Hierbert, et. al (Hierbert T, Miles J & Okeson G C; Contaminated aerosol recovery from pulmonary function testing equipment. Am J Respir Critical Care Med Vol 159. pp 610-612, 1999) that this is the safety margin required to allow aerosolized organisms to be removed from a vapor state by gravitational sedimentation and condensation. Infectious microbes in a solid state are less mobile than in an aerosolized state; making cross infection less likely.

DOES ISOLATING AN INSTRUMENT FOR A PERIOD OF TIME ENSURE THAT THE INFECTING MICRO-ORGANISMS ARE NO LONGER ACTIVE?

Bacteria and viruses have a limited life span outside of the body. They tend to last longer on non-porous surfaces than porous ones. They tend to last shorter periods of time in low humidity environments and they can be disabled if they are exposed to certain chemicals or radiated energy.

While different bacteria or viruses can survive for different lengths of time, most will become inactive within several days, once outside the body, but there are some, like the MRSA bacteria or Norovirus that can remain active for several weeks outside the body.

Early studies indicate that the Novel Coronavirus SARS-CoV-2 can remain viable in aerosols for multiple hours and on surfaces for up to days (see Additional Reference link to article, Aerosol and surface stability of HCoV-19 (SARS-CoV-2) compared to SARS-CoV-1.)

The fact is that time can be used as a strategy to eliminate the risk of transmission, but using it as the only line of defense means that you would have to have a great deal of knowledge about all of the infecting microbes that you are trying to eradicate and you would likely need a great deal of time where the instrument would need to be isolated.

We suggest that time can be used as part of the solution, but using it as the sole prophylactic is not practical in most cases so actively cleaning and/or disinfecting the instrument will often need to be the backbone of a program.

USER'S ROLE

Test Protocol

It is the responsibility of the user to determine the test protocols and procedures for their breath testing program.

In order to develop an effective plan for cleaning and disinfecting, it is important to understand how contamination most frequently occurs.

There are three main paths for contamination:

1. breathing aerosolized particles,
    a. The subject could suck aerosolized particles in from a previously contaminated instrument or part.
    b. The instrument operator could be infected from the breath of an infected subject.
2. skin contact with breath condensate particles coming directly from the breath sample.
    a. The instrument operator could have this condensate on them which could be transferred to another person allowing them to be infected or it could cause an infection of the operator if they touch their nose, mouth or eyes with the infected substance.
3. skin contact with saliva or other bodily fluids deposited on the instrument or expectorated directly onto the operator
    a. The instrument operator could transfer the infected substance to another person allowing them to be infect themselves or it could cause an infection of the operator if they touch their nose, mouth or eyes with the infected substance.

A few good practices to follow:

- Check the instrument to make sure it is clean before testing a subject
- Wearing clean disposable gloves for each subject. This will reduce the likelihood of:

- the operator infecting the instrument or mouthpiece, thus exposing the subject to infection

- the subject infecting the operator by transferring infectious material onto the operator's hands during breath sampling or mouthpiece removal which can then be transferred into the operator's mouth, eyes or other pathways that can result in infection.

- Position the subject so that when the sample is provided, the breath flow is directed away from the operator. During the test, make sure you have good ventilation in the space that you are performing the test.

- Change the mouthpiece for each subject test sequence

    - Researchers (such as A.H. Kendrick) who have studied pulmonary testing equipment have found that the deposition of breath matter is directly proportional to the distance from the mouth, i.e., most deposition occurs within a few centimeters of the mouth with corresponding decrease of deposition further away from the mouth. If we apply these findings to breath alcohol testing it is assumed that a high proportion of deposition occurs within the mouthpiece as well as the major risk of the saliva on the outside of the mouthpiece.

    - the greatest danger of cross-infection is via direct contact with bodily fluids and the mouthpiece is the most likely place for residual fluids to exist after a breath sample has been provided.

    - the design of the mouthpiece can further reduce the likelihood for disease transmission. Your instrument may have more than one type of mouthpiece design for use. If the instrument design allows, consider:

        - a mouthpiece that makes up as much of the sampling chamber as is possible.

            - This design eliminates most all of the possible wetted areas that exist after the mouthpiece is disposed of, thus reducing parts that can hold deposited matter from a previous sample; or

        - a mouthpiece that has a check valve so that reverse flow (suck back) from instruments with internally contaminated surfaces is not possible; and

        - a mouthpiece or instrument design that directs the breath flow away from the operator

        - a mouthpiece that is ejected from the instrument without the need for handling it, or is easily removed, reducing the chance of contact with saliva or breath condensate.

- Make sure the instrument is clean and ready for use after testing a subject.

- It is recommended that a delay of at least five minutes be allowed between test subjects because it has been shown by Hierbert, et. al (Hierbert T, Miles J & Okeson G C; Contaminated aerosol recovery

  from pulmonary function testing equipment. Am J Respir Critical Care Med Vol 159. pp 610-612, 1999) that this is the safety margin required. This allows aerosolized organisms to be removed by gravitational sedimentation between tests and reduces the likelihood that an aerosolized infecting microbe will infect a subsequent subject.

An Example Timetable of Cleaning and Disinfecting

EVERY TEST: Perform a visual inspection at the beginning and end of testing to determine if cleaning or disinfecting is necessary. Check the mouthpiece to ensure that it is clean and unused.

DAILY: Perform a visual inspection before the first test of day. If there is visible contamination on the instrument, clean and disinfect.

PERIODICALLY (as determined by your organization based on use or elapsed time): Disinfect all exposed parts of the instrument which can come into contact with subjects or operators.

Methods for cleaning and for disinfecting

Consider creating a list of acceptable methods and products that can be used for cleaning and disinfecting the instrument. Your guidelines should provide instructions on how and when to use each method. To learn more about the methods discussed in this brief there are references for additional information available in the Additional References section of this document.

General Cleaning Rules

Utilizing a liquid or wipe:

Read the label of the cleaner or disinfectant before using it. The instructions should tell you:

- What precautions you should take when applying the product, such as wearing gloves or aprons or making sure you have good ventilation during application.
- How to apply the product to a surface.
- Instructions on how to prepare (e.g., dilute) if the product is a concentrate.
- Contact time - How long you need to leave it on the surface to be effective.
- If the surface needs to be cleaned first and/or rinsed after using.
- If the product is safe for the surface.

  - Intoximeters, Inc. does not warrant against the use of any cleaning product that might damage the instrument. To avoid damaging the instrument it is important that you take steps to test the chemical to ensure that it does not discolor or otherwise damage the

instrument's case, display or nipples before applying the solution to the entire instrument.

A Few Other Recommendations:

- Use disposable gloves to clean the instrument prior to applying cleaner or disinfectant.
- Wash hands after removing disposable gloves.
- Be certain not to let liquid get into the sample system (fuel cell or pressure sensor) or onto the instrument's circuit board(s).
- Do not submerge the instrument in a liquid. Use a moist, but not dripping cloth to apply the cleaning solution to the exterior surfaces that you wish to clean.
- Follow the cleaner/disinfectant manufacturers guidelines to clean exterior surfaces where the subject has come in contact with the instrument or subject's breath or other expectorants have come in contact with the instrument.
- If cleaning internal surfaces of the instrument is required, a factory maintenance technician can be employed to provide this service. Removing the case covers (not including the battery cover) to access internal components for cleaning may void your warranty.
- Let the instrument dry completely after cleaning or disinfecting process and then observe a fifteen-minute waiting period before subject testing resumes.

Lists exist on the EPA's website for tested wipes and disinfectants, including list for registered antimicrobial products for use against Novel Coronavirus SARS-CoV-2.

CLEANING AND DISINFECTING SUGGESTIONS

ALCO-SENSOR, ALCO-SENSOR III

The Alco-Sensor and Alco-Sensor III product lines have a single nipple that the mouthpiece attaches to. The mouthpiece is effectively the entire sample path for the provided breath sample.

The mouthpieces are designed such that the breath enters at one end of the mouthpiece and exits at the other end.

After the test is performed remove the mouthpiece from the instrument using disposable gloves. Some instruments are fitted with a mouthpiece ejector which would allow the operator to discard the mouthpiece without touching it.

Unless the subject has expectorated a liquid onto the instrument, only a review of the nipple that the mouthpiece attaches to will be necessary. During a properly provided sample, the nipple is the only instrument part that comes in contact with the sample and is therefore the only part that remains after the mouthpiece from that test is removed and discarded.

However, if the subject has created enough condensed breath or has expectorated liquid into or around the mouthpiece that travels onto the instrument, cleaning or disinfecting may be called for.

Cleaning an Alco-Sensor, Alco-Sensor III –

If there is a reason that necessitates a cleaning or disinfecting of the instruments it is prudent to clean the entire instrument since it will not take much more time than cleaning just the part (likely the nipple) that has deposited material on it.

A slightly damp cloth with mild detergent can be used to clean the instrument surfaces and the outside of the nipple that the mouthpiece attaches to but take great care when cleaning the nipple to avoid getting water on or into the hole on the top of the nipple. Liquid drawn into the sample port can damage the instrument.

The entire cleaning process usually takes less than 10 minutes.

Disinfecting an Alco-Sensor, Alco-Sensor III

To disinfect an Alco-Sensor or Alco-Sensor III use an effective wipe or towelette that contains a disinfecting agent. The EPA provides lists of effective cleaning materials (the Reference section of this document to provides a link to a list of cleaning materials effective for Novel Coronavirus SARS-CoV-2. The EPA has lists for other cleaning materials for other diseases as well.)

An effective towelette can be used to clean the case and mouthpiece channel. Many of these wipes have a relatively high concentration of alcohol or contain peroxide or sodium hypochlorite (the active ingredient in bleach).

While alcohol-based disinfectants can craze the instruments plastics and eventually damage their integrity; we believe that using an alcohol-based disinfectant may still be one of the better options for disinfecting your instrument if you are going to use a liquid or towelette cleaner.

The data suggests that when using either ethanol or isopropanol based disinfectants, for best performance, the disinfectant has an alcohol concentration of 62% to 71%. Additionally, when applied, the surfaces should be exposed to the cleaning liquid for the period of time as stated on the product's directions for use.

Obviously, care needs to be taken with an alcohol based cleaner since these instruments are used to measure breath alcohol concentrations and it is important that the alcohol from the disinfecting product will not impact subsequent test results.

If either the towelettes or damp cloth used to remove the alcohol solution are wet enough to produce liquid droplets, be sure to keep from introducing those droplets into the hole on the top of the instrument's nipple. Be certain that the instrument is completely dried and had time for any evaporated alcohol to have dissipated. A good rule of thumb for ensuring the dissipation of a volatile is to wait 15 minutes after the wetted surface has dried before subject testing resume.

The entire disinfecting process usually takes between than 10 minutes and 30 minutes

ALCO-SENSOR IV

Running a Test - The Alco-Sensor IV product line has a one-way mouthpiece that is inserted into the instrument to turn the instrument on. The mouthpiece allows the subject to provide a sample for analysis. The mouthpiece is a large portion of the breath sample path, and the check valve in the mouthpiece reduces the likelihood that a subject will draw an inhaled breath sample, from the instrument, back through the mouthpiece.

The breath sample is directed away from the instrument and a properly positioned operator by leaving the instrument through the exit port on the rear of the instrument at a ninety degree angle from the direction that the subject provides the sample.

Disposable gloves will protect the operator getting breath condensate, aerosolized breath or saliva from the instrument or subject's breath onto their hands. Additionally, disposable gloves will reduce the possibility that the operator contaminates the mouthpiece.

The Alco-Sensor IV has a mechanism that will eject the mouthpiece from the instrument which eliminates the need for the operator to handle a used mouthpiece.

At the end of each test, inspect the channel that the mouthpiece attaches to, observe the outside of the case (with particular care to observe the breath outlet port on the back of the instrument). If there is liquid observed on the instrument case, refer to your procedure to determine whether a cleaning or disinfection is required. If the subject has created enough condensed breath or has expectorated liquid into or onto the instrument, or onto the operator, refer to your maintenance guidelines for cleaning and disinfecting instructions.

After the test is completed the operator should remove and dispose of their gloves before washing their hands.

Cleaning an Alco-Sensor IV

If cleaning is required, to clean the instrument, the mouthpiece entry port should be cleaned along with the breath flow exit port on the rear face of the instrument. Since it will not take much more time, it is prudent the entire external portion of the instrument's case be cleaned as well.

A slightly damp cloth with mild detergent can be used to clean the instrument surfaces. Take great care when cleaning the mouthpiece channel as you will not want to leave liquid droplets in the channel after cleaning.

The entire cleaning process usually takes less than 15 minutes.

Disinfecting an Alco-Sensor IV

To disinfect an Alco-Sensor IV use an effective wipe or towelette that contains a disinfecting agent. The EPA provides lists of effective cleaning materials (the Reference section of this document to provides a link to a list of cleaning materials effective for Novel Coronavirus SARS-CoV-2. The EPA has lists for other cleaning materials for other diseases as well.)

An effective towelette can be used to clean the case and mouthpiece channel. Many of these wipes have a relatively high concentration of alcohol or contain peroxide or sodium hypochlorite (the active ingredient in bleach).

While alcohol-based disinfectants can craze the instruments plastics and eventually damage their integrity. We believe that using an alcohol-based disinfectant may still be one of the better wetted options for disinfecting your instrument.

The data suggests that when using either ethanol or isopropanol based disinfectants, for best performance, the disinfectant has an alcohol concentration of 62% to 71%. Additionally, when applied, the surfaces should be exposed to the cleaning liquid for the period of time as stated on the product's directions for use.

Obviously, care needs to be taken with an alcohol based cleaner since these instruments are used to measure breath alcohol concentrations and it is important that the alcohol from the disinfecting product will not impact subsequent test results.

If either the towelettes or damp cloth are wet enough to produce liquid droplets, be sure that the instrument is completely dried and had time for any evaporated alcohol to have dissipated. A good rule of thumb for ensuring the dissipation of a volatile is to wait 15 minutes after the wetted surface has dried before subject testing resumes.

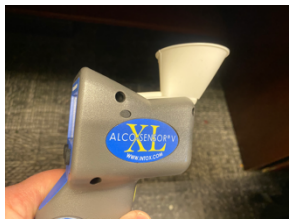
Disinfecting the instrument, depending upon the method used can be expected to take 10 to 40.

ALCO-SENSOR FST, ALCO-SENSOR V XL

The Alco-Sensor FST and Alco-Sensor V_{XL} products have two nipples that a mouthpiece attaches to. The mouthpieces are effectively the entire sample path. The mouthpiece for these instruments are designed to direct the breath out the top of the mouthpiece.

After the test is performed the mouthpiece should be removed from the instrument using disposable gloves. If the subject has not expectorated a liquid onto the instrument only a review of the nipple that the mouthpiece attaches to will be necessary. During a properly provided sample, the nipples are the only instrument part that comes in contact with the sample, and are therefore the only parts that remain after the mouthpiece from that test is removed and discarded.

However, if the subject has created enough condensed breath or has expectorated liquid into or around the mouthpiece that travels onto the instrument, cleaning or disinfecting may be called for.



Passive Testing – A user should strongly consider whether or not they will use this method of testing. Given that there is uncontrolled breath being delivered towards the instrument, the ability of the operator to control where the breath goes is lessened.

If the user believes that it is necessary and safe, extreme care should be taken to avoid the subject blowing on the instrument's operator. Gloves, protective clothing, glasses, masks, or respirators should be considered for use by the operator to avoid airborne transmission of an infectious disease, or the depositing of infectious particulates that can later be transmitted to the operator or others.

For those that choose to perform passive testing:

- use the cup/breath guide to capture a subject's breath sample and to help avoid breath particulates from depositing on the instrument or the operator.
- use a separate disinfected cup/breath guide for each subject.
- do not have the subject blow directly at the instrument without the cup/breath guide.
- The users guidelines should indicate whether the instrument should be disinfected if breath particulates are deposited on it after a sample is collected.
    - Follow the instructions for cleaning/disinfecting the instrument as described below.

Since the subject is not coming in direct contact with the passive cup/breath guide, the cup/breath guides can be re-used after disinfecting. To disinfect the cup/breath guide, use an effective alcohol wipe (see Additional Reference section of this document for the EPA's list of wipes that can disinfect surfaces for coronavirus and other infectious diseases) or other effective disinfecting product, in accordance with the products directions for effective use. If an alcohol based cleanser is used, and

you have no way of determining if the alcohol has dissipated, the cup/breath guide should be allowed to sit for fifteen minutes after the disinfectant has dried to make certain that all of the alcohol has dissipated before a subsequent use.

Cleaning an Alco-Sensor FST, Alco-Sensor V_{XL}

To properly clean the instrument, clean the nipples and the instrument's case.

A slightly damp cloth with mild detergent can be used to clean the instrument surfaces and the outside of the nipples that the mouthpiece attaches to, but take great care when cleaning the nipples to avoid getting water on or into the holes on the top of the nipples. Liquid drawn into the sample port can damage the instrument and liquid that gets into the pressure port can disable automatic sampling.

The entire cleaning process usually takes less than 10 minutes.

Disinfecting an Alco-Sensor FST, Alco-Sensor V_{XL}

To disinfect an Alco-Sensor FST or Alco-Sensor V_{XL} use an effective wipe or towelette that contains a disinfecting agent. The EPA provides lists of effective cleaning materials (the Additional References section of this document provides a link to a list of cleaning materials effective for Novel Coronavirus SARS-CoV-2. The EPA has lists for other cleaning materials for other diseases as well.)

Many of these wipes have a relatively high concentration of alcohol or contain peroxide or sodium hypochlorite (the active ingredient in bleach).

While alcohol-based disinfectants can craze the instruments plastics, we believe that using an alcohol-based disinfectant may be one of the better options for disinfecting your instrument.

The data suggests that when using either ethanol or isopropanol based disinfectants, for best performance, the disinfectant has an alcohol concentration of 62% to 71%. Additionally, when applied, the surfaces should be exposed to the cleaning liquid for the period of time as stated on the product's directions for use.

Obviously, care needs to be taken with an alcohol based cleaner since these instruments are used to measure breath alcohol concentrations and it is important that the alcohol from the disinfecting product will not impact subsequent test results.

If either the towelettes or damp cloth used to disinfect are wet enough to produce liquid droplets, be sure to keep from introducing those droplets into the hole on the top of the instrument's nipple. As well, be sure that the instrument is completely dried and had time for any evaporated alcohol to have dissipated before placing the instrument back into service. A good rule of thumb for ensuring the dissipation of a volatile is to wait 15 minutes after the wetted surface has dried before subject testing resumes.

Disinfecting the instrument, will normally take between 10 to 30 minutes.

ADDITIONAL REFERENCES:

The risk of breath alcohol instrument contamination

Center for Disease Control (CDC) - http://www.cdc.gov

- **CDC –** How to clean and disinfect **-** https://www.cdc.gov/coronavirus/2019-ncov/community/home/cleaning-disinfection.html#disinfect
- **CDC - Environmental** Cleaning and Disinfecting Guidelines **-** https://www.cdc.gov/coronavirus/2019-ncov/community/home/cleaning-disinfection.html

Environmental Protection Agency (EPA) - https://www.epa.gov/

- EPA's Registered Antimicrobial Products - https://www.epa.gov/pesticide-registration/selected-epa-registered-disinfectants
- EPA's Registered Antimicrobial Products for Use Against Novel Coronavirus SARS-CoV-2, the Cause of COVID-19 https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2

Evaluation of alcohol wipes used during aseptic manufacturing, M.N Panousi, G.J Williams, S. Girdlestone, S.J. Hiam, J-Y Mailard, Letter in Applied Microbiology, Volume 48, Issue 5, May 2009. https://sfamjournals.onlinelibrary.wiley.com/doi/full/10.1111/j.1472-765X.2009.02574.x

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