



Hard Floor Cleaning and Disinfection Options in Educational Facilities



Overview

The COVID-19 global pandemic has caused educational institutions to re-evaluate operational practices to ensure student safety from the novel coronavirus (SARS-CoV-2), which causes COVID-19 disease. One area receiving increasing scrutiny is floor hygiene. With a wide range of options for cleaning and disinfection of hard floors and the relative infection risk posed by floors being poorly understood, it is challenging to determine the best option for an educational facility.

This document discusses the main floor cleaning and disinfection options and the benefits and limitations of each option and discusses Diversey's recommended best practices.

These materials are provided for general information purposes only and do not replace each user's responsibility to assess the operational, legal and other requirements applicable to each facility.



Background and Virus Transmission:

When pandemics, such as COVID-19, reach the level of widespread community transmission, the pathogen will be easily transmitted from person to person and public health practices will be considered including:

- Identifying sick people and keeping them isolated while recovering
- Social distancing and limits on the number of people in a given area
- Protective barriers such as screens, partitions, and other physical barriers
- Respiratory hygiene and the use of masks
- Hand hygiene
- Surface disinfection

For SARS-CoV-2, the main route of person to person transmission is believed to be small respiratory droplets that are expelled from a person when they breathe, talk, sing, cough, or sneeze. If respiratory droplets contaminated with the virus are inhaled or swallowed, a person can become infected and develop COVID-19.

While not the primary route of infection respiratory droplets that land on environmental surfaces can result in hand contamination, which can lead to self-inoculation (by touching one's face), infection, and developing the disease. While environmental contamination is only likely to contribute to a small portion of the overall infection risk (i.e. 10-20% of all SARS-CoV-2 infections), it is still an important risk that must be addressed.

Risk of High Touch Surfaces versus Floors:

The risk of transmission of viruses from environmental surfaces to hands is well established. The phrase "high touch surface" is used to refer to a surface that is likely to receive a significant amount of hand contact. Examples of high touch surfaces in education facilities include door handles, elevator buttons, railings, light switches, water faucets, toilet flush handles, tables, desks, and chairs. For the portion of SARS-CoV-2 risk associated with surfaces, these surfaces are the most likely to contribute to person to person transmission. Methods for controlling the risk from high touch surfaces include frequent hand hygiene and surface disinfection.

Floors have historically been viewed as contributing no risk to hand contamination (which could lead to infection). Recently a new set of studies in healthcare facilities have demonstrated that there is likely some risk associated with floors, but that level of risk is so far unquantified.

Examples of how floors may play a role in virus transmission in an educational facility include:

- Students sitting or lying on floors and touching the floor with their hands
- Students placing objects on the floor (such as backpacks, lunch containers, purses, and other personal items) and then touching the item without washing their hands
- Students in athletic facilities, fitness centers or gymnasiums, secreting body fluids and picking up from wrestling, tumbling, and other activities
- Virus on the floor may be moved by foot traffic which can cause floor contamination to become airborne and potentially land on people

As a consequence, many facilities are considering switching from routine cleaning of floors to routine cleaning and disinfection of floors. While the evidence supporting that floor disinfection is necessary is very limited, the desire to disinfect floors is heightened due to concerns for student safety.

The latest CDC guidance on facility reopening (2020) does not list floors as a surface requiring disinfection. While the guidance does advise that frequent disinfection of surfaces and objects touched by multiple people is important, it also states that surfaces and objects that are not frequently touched should be cleaned and do not require additional disinfection. Thus for public spaces, including educational facilities, routine disinfection of floors should not be necessary to address the risk of SARS-CoV-2. Blood and body fluid spills on floors would continue to require the use of a disinfectant.

Within an educational facility, common areas and hallways may generally be a low risk level, but certain floor areas may be a higher risk. Areas that may be higher risk include floors where students sit or lay on the floor, such as lunch areas, nap areas, and exercise areas. It may be appropriate to consider disinfection on these areas while maintaining a standard cleaning method for other floor areas. Risk assessments are commonly performed in educational facilities to determine whether cleaning or disinfection is needed, and should be done as part of any application method change.



Hygiene Outcomes of Cleaners and Disinfectants on Floors

With formulated cleaners, their role is to facilitate soil removal from floors. Visible soil should be removed by sweeping, dust mopping, or dry mopping before the wet cleaning which removes smaller/finer soil particles. The use of surfactants and solvents in a floor cleaner provides emulsification of a wide range of soils and enables efficient removal of soil from floors. An important part of proper cleaning is the mechanical action to the surface of the floor, which helps remove soil. The use of a scrubber-drier (auto scrubber), flat mop, or other mopping tool improves soil removal by mechanically agitating the floor surface during cleaning although the amount of mechanical action provided varies significantly by application method. In standard low risk cases, the level of microorganism removal generated by the mechanical and chemical action of cleaning the floor is adequate to provide an acceptable level of floor hygiene.

When used, the role of the disinfectant is to kill or inactivate the microorganisms left on the floor after the cleaning process. A disinfectant with good cleaning properties makes it easier for the disinfectant portion of the product to kill any remaining pathogenic microorganisms. When a disinfectant is used, the disinfectant is applied to the floor and remains on the floor after the mechanical action of cleaning (manual mopping or use of a scrubber-drier). To achieve the optimal efficacy, the disinfectant must remain wet on the floor for the contact time listed on the product label, and the floor must not receive foot traffic while the floor is wet, which would re-contaminate the floor.

Floor disinfection in nightly cleaning will have a limited impact on the hygiene level on the floor during the school day. As students and staff walk or sit on the floor, the floor rapidly becomes re-contaminated and may create a risk of pathogen transmission. It may be necessary to clean or disinfect a floor multiple times per day if a given section of floor is considered higher risk.

Options in Floor Hygiene:

There are a number of important factors in considering a change from floor cleaning to floor disinfection. This section reviews the common application methods of achieving floor hygiene and discusses the benefits and limitations of each method. With any of these methods a cleaner or disinfectant can be used, but for simplicity, we refer to cleaning to include both product options.

- 1. Scrubber-drier.** In this method, a machine is used to apply cleaning solution to the floor. The machine also is equipped with a pad to provide mechanical action and a vacuum and squeegee to ensure the floor is dry and safe to walk on after cleaning. The machine is equipped with a floor pad that is removed and cleaned at the end of the shift.
- 2. Flat Mop-launderable.** In this method, an absorbent mop pad is saturated with cleaning solution and wiped across the floor using a mopping handle/frame to hold the mop pad. The mop head is changed frequently during the shift. This method may include a charging container, but mop heads should not be put into the charging container more than once.
- 3. Microfiber Mop-launderable and disposable.** This method is similar to the flat-mop option, but the mop head is made from microfiber, which may provide a higher level of friction on the floor when mopping. The mop head is similarly changed frequently during the shift. While a charging container may be used with some microfiber mops, where mop heads are immersed in cleaning solution immediately before cleaning, another variation is to prewet a group of mops in the charging container by stacking mop heads on their side in the charging container and pouring a predetermined amount of cleaning solution over the stacked mops. Capillary action wicks the cleaning solution into the mop heads so that they are ready for use.
- 4. Cotton String Mop.** This method uses a mop head composed of a series of cords/strings of cotton and is used with a mopping bucket containing the cleaning solution. The mop head is typically submerged in the bucket multiple times during cleaning. While a less hygienic method of cleaning than the other methods listed, it is still seen in practice.

Hygiene Implications of Each Floor Cleaning Method When Performed with Disinfectant:

Consideration	Scrubber-Drier	Flat-Mop	Microfiber Mop	Cotton String Mop
Mechanical Action	High	Low	Medium	Low
Keeps floor wet for contact time of disinfectant	Only with 2 passes	Yes	May not if too little disinfectant is used	Yes
Risk of cross-contamination from method	High if walk-behind, otherwise low	Medium (if re-submerged)	Low if single charge Medium (if re-submerged)	High due to re-submerging the mop in the bucket
Risk of binding with quat disinfectants	No risk	High risk	High risk	High risk

The table above identifies some key considerations in selecting a floor cleaning method when attempting to disinfect the floor.

- 1. Scrubber-driers.** The highest mechanical action, and thus the best soil removal will come from using a scrubber-drier. However, when a scrubber-drier is used in a single pass with disinfectant, this method would not keep the floor wet long enough for the disinfectant to work. If disinfecting with a scrubber-drier, a two pass method where on the first pass disinfectant is applied and the floor is agitated (pad on, vacuum off, squeegee up) and after the contact time the scrubber-drier is used on the floor again (with the vacuum on, squeegee down). When scrubber-driers are used with disinfectants, all surfaces of the machine that touch the floor or receive hand contact should be manually disinfected each night. This includes squeegees, machine controls, etc.
- 2. Manual mopping.** Friction in manual floor mopping methods all are sensitive to the mop-floor friction, which is heavily influenced by the amount of cleaning solution. Higher amounts of cleaning solution cause the floor mop to glide, reducing the mechanical action from mopping. Microfiber mops especially that are oversaturated provide less mechanical action, but may keep the floor wet longer, providing better disinfection.
- 3. Floor contamination.** Any method where the worker or others walk on the floor while wet re-contaminates the floor and creates a slip-fall risk.
- 4. Quat binding.** When quaternary disinfectants are used, quat-binding with the mopping substrate can occur, which reduces the amount of efficacy achieved. The solution on the floor can be tested to see if quat binding is occurring. Mop heads treated to prevent quat binding are available.

Diversey Best Practice Recommendation for Educational Facilities:

Diversey's best practice recommendation for floor hygiene in educational facilities includes:

1. For all areas, sweep, dust mop, or dry mop the floor before cleaning.
2. For general risk areas, use of a scrubber-drier with neutral cleaner in a single pass method, cleaning all floors at least daily.
3. For elevated risk areas, use of a flat mop with disinfectant. If a quaternary disinfectant is being used, the flat mop should be treated to prevent quat binding. When disinfecting the floor in elevated risk areas, the frequency of floor disinfection should be based on a risk assessment to align periods of higher risk with the timing of the disinfection.

Summary:

This document discussed floor hygiene in educational facilities and the various application methods, associated hygiene outcomes, and certain risks associated with the methods. Diversey best practice recommendations for floor hygiene were also discussed. If there are any questions about this document, please contact Diversey Customer Service.



Diversey has been, and always will be, a pioneer and facilitator for life. We constantly deliver revolutionary cleaning and hygiene technologies that provide total confidence to our customers across all of our global sectors.

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References

Centers for Disease Control and Prevention. Reopening guidance for cleaning and disinfecting public spaces, workplaces, businesses, schools, and homes. 2020. Retrieved from: <https://www.cdc.gov/coronavirus/2019-ncov/community/reopen-guidance.html>