

# Do we need better buildings? What are they, how do we get there?



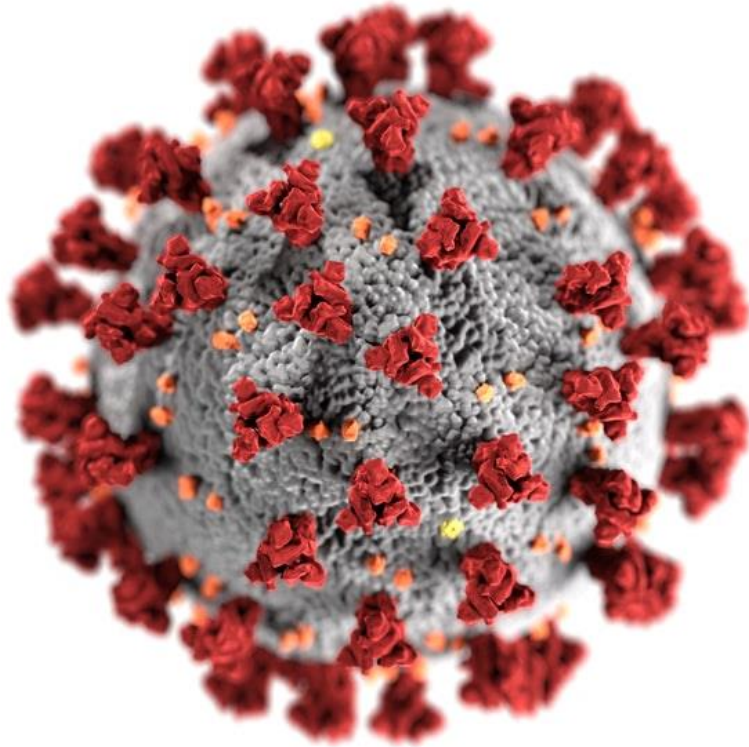
Walter Zapor  
Senior Associate/Project Manager



Nicholas Kaintz, PE, LEED AP  
Vice-President / Mechanical Engineer

# AGENDA

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- 1) Surface materials and treatments, including products with integral anti-microbial substances
- 2) New and retrofitted HVAC systems with advanced filtering and air change strategies
- 3) Lighting with non-visible wavelengths that aid in infection control

# GENERAL HAZARDS FOR SENIOR LIVING COMMUNITIES

Possibilities of transmission in senior living communities:

- Close personal contact
- Surfaces, especially shared ones
- Aerosolized transmission of virus droplets

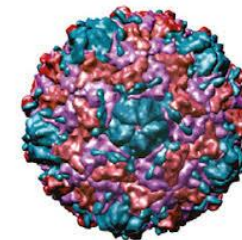


“Strategies for Senior Living” - AIA

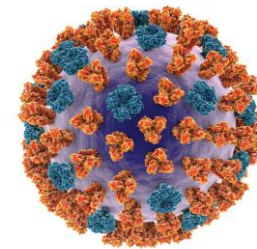
# BUILDING SURFACES



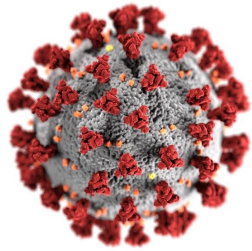
- Shared surfaces can transmit infections.
- The type of material contributes to its transmission.
  - Existing materials
  - New materials



Cold



Flu



Covid-19

# STANDARDS AND GUIDELINES

## ASTM D6329 - 98(2015)

Standard Guide for Developing Methodology for Evaluating the Ability of Indoor Materials to Support Microbial Growth...

**UL Environment** lists specific products that have been found to be microbially resistant when tested according to a test method following the guidelines of ASTM D 6329 and analyzed with a quantitative scale.

## ISO 22196:2011 (International Standards Organization)

Measurement Of Antibacterial Activity On Plastics And Other Non-Porous Surfaces

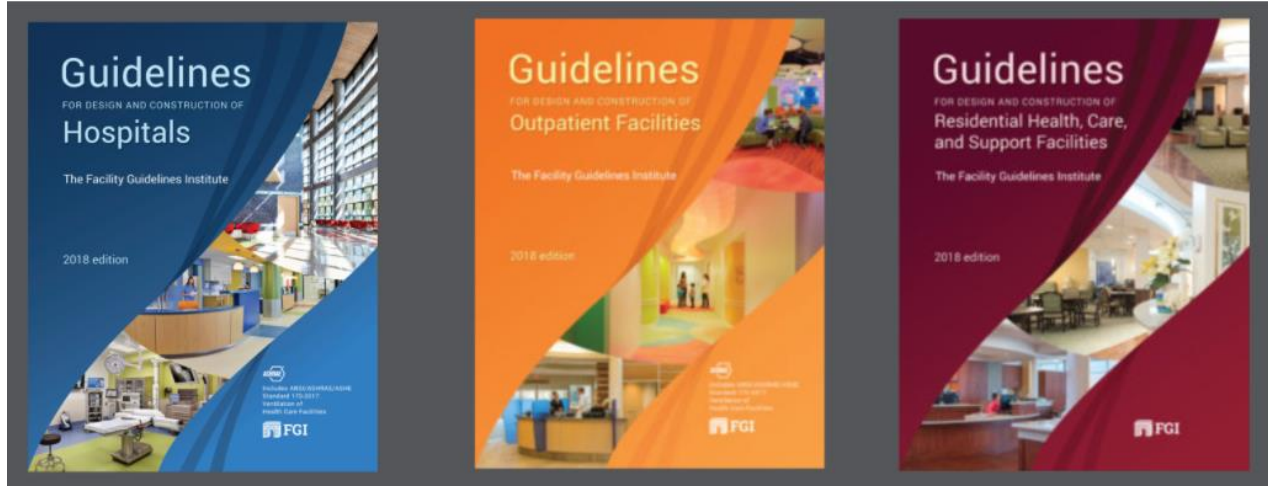
ISO 22196:2011 specifies a method of evaluating the antibacterial activity of antibacterial-treated plastics, and other non-porous, surfaces of products (including intermediate products).

## The JIS Z 2801 (Japan Industrial Standards)

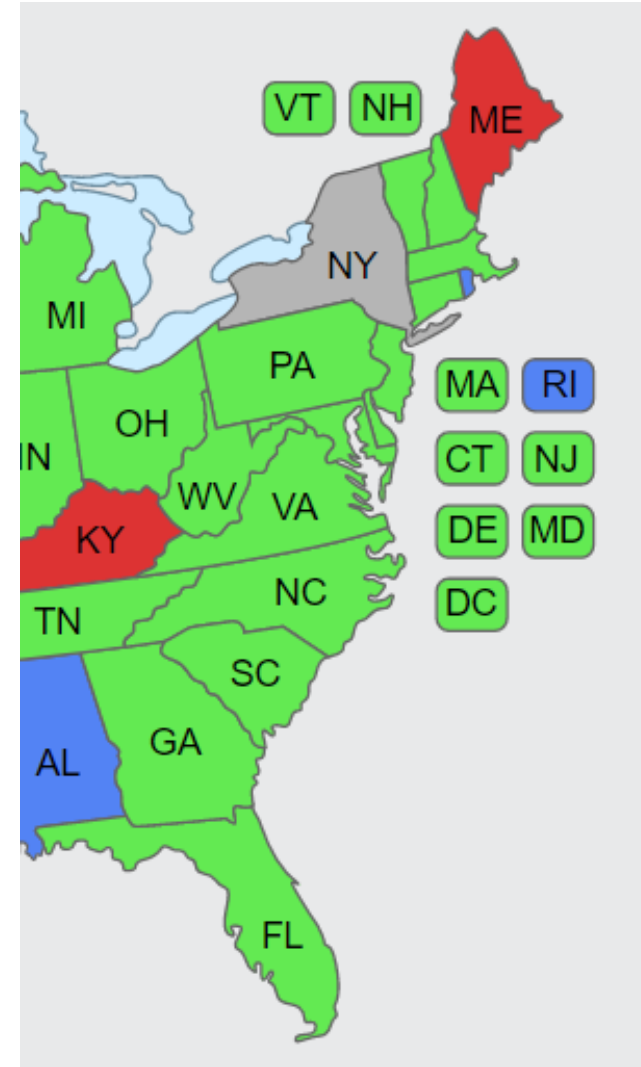
Method tests the ability of plastics, metals, ceramics and other antimicrobial surfaces to inhibit the growth of microorganisms or kill them.



# STANDARDS AND GUIDELINES



- Design and Construction of Hospitals,
- Design and Construction of Outpatient Facilities
- Design and Construction of Residential Health, Care, and Support Facilities



\*Guidelines may be applied as an equivalency to state rules.

# STANDARDS AND GUIDELINES

## 2.4 DESIGN AND CONSTRUCTION REQUIREMENTS

### \*2.4-2.1.2 Characteristics and Criteria for Selecting Materials and Products

\*2.4-2.1.2.1 General. The effect of surface materials, colors, textures, and patterns on resident, staff, and visitor safety and on maintenance and life cycle

#### APPENDIX

A2.4-2.1.2 The effects of demolition and replacement and repair of materials and products used in residential health, care, and support facilities should be considered when selecting surface and finishing materials and products for use in environments that are occupied 24 hours a day, seven days a week.

#### A2.4-2.1.2.1 Characteristics and criteria for selecting surface and finishing materials and products

a. Residential health, care, and support facilities should incorporate architectural detail, surface, and finishing materials and products that:

- Optimize sensory function in accordance with the vision and lighting guidelines established by ANSI/IES RP-28: Lighting and the Visual Environment for Seniors and the Low Vision Population and provide optimum light levels and glare-free finishes for the safety and vision comfort of residents and staff.
- Optimize acoustic comfort, speech privacy, and acoustic and communication; mitigate alarm fatigue; and consider resident use of hearing aids.

b. The additional characteristics and criteria in this section should be used for designing architectural details and selecting and specifying products and materials for all residential health, care, and support facility design and construction projects. (The characteristics included in this text are supported by quantifiable industry test methods. See the Facility Guidelines Institute website under the Resources tab.)

—Durable. Architectural detail, surface, and finishing materials and products should be resistant to breakage, punctures, tears, stains, and damage and wear from abrasion as appropriate to the function of the material and product type being selected. See appendix section A2.2-2.1 (Use of Resilient-Impact Materials) for additional information.

—Resilient and impact-resistant. Architectural detail, surface, and finishing materials should remain intact, safe, and functional in heavy weight-bearing, high-traffic, and impact-susceptible areas. Materials and products selected should meet the following requirements:

- "Pounds per square inch" (PSI) weight tolerances for loads
- Tensile strength, flexibility, impact, and abrasion testing standards for the required use and application
- Surface bounces back from compression caused by repeated use and does not shatter or fragment under abrasion or impact

performance that is consistent with the overall planning and design of the facility.

2.4-2.1.2.2 Resident safety risk assessment issues. Architectural detail, surface, and finishing materials and products selected for residential health, care, and

—Reduce user fatigue and musculoskeletal injury. Architectural detail, surface, and finishing materials should:

- Meet specific safety, assembly, and construction industry criteria for flexibility to address foot compression and heel strike absorption.
- Support foot comfort and reduce the fatigue and musculoskeletal injury effects of long-term continued use or bodily damage from impacts or falls.

—Use safe and compatible materials in assemblies, including substrate and surface finish materials:

- All assembled materials should meet the characteristics listed in Section 2.4-2.2 (Architectural Details), 2.4-2.3 (Surfaces), and 2.4-2.4 (Finishing).
- All seams and joints in assemblies should be joined to reduce wear and degradation and should be able to remain intact during the proposed service life of the assembly.
- Water-resistant materials, sealed-seam construction methods, and moisture-impervious surface selections should be used for assemblies where water or moisture is continuously present (e.g., clinical use work surfaces with inset or integral sinks, flooring, overhead assemblies, showers, other bathing areas) to reduce or eliminate the possibility of leakage in or under the assembly.

—Safe and efficient for use in occupied residential settings over time. Throughout their life cycle, architectural detail, surface, and finishing materials and products should minimize and/or prevent the incidence and effects of noise, odors, gas, particulates, dust, and debris that reduce indoor air quality during product assembly, installation, and operation as well as maintenance, repair, or demolition in occupied residential health, care, and support facilities. See appendix section A2.2-2.4.1 (Emissions and VOCs) for additional information.

—Appropriate for the emotional and cultural well-being of residents, staff, and visitors. Design, layout, size, color, and pattern of architectural details, surfaces, and finishing materials should create residential environments that support the needs of users and operators providing the facility or setting. See Section 1.2-4.1.8 (Cultural Responsiveness) for additional information.

- In any design project, the selection of a color palette should be based on many factors, including the building population, anticipated activities in the space, and lighting design strategy.
- Finishes and color palettes should respond to the geographic location of the residential health, care, and support

## 2.4 DESIGN AND CONSTRUCTION REQUIREMENTS

### \*2.4-2.1.2 Characteristics and Criteria for Selecting Materials and Products

Water-resistant materials, sealed-seam construction methods, and moisture-impervious surface selections should be used for assemblies where water or moisture is continuously present (e.g., clinical use work surfaces with inset or inte-

tenance, repair, or demolition in occupied residential health, care, and support facilities. See appendix section A2.2-2.4.1.1 (Emissions and VOCs) for additional information.

SOME ITEMS FROM FGI Section 2.4

# STANDARDS AND GUIDELINES



ANSI/ASHRAE Standard 62.1-2016  
Supersedes ANSI/ASHRAE Standard 62.1-2010  
Includes ANSI/ASHRAE addenda listed in Appendix K

## Ventilation for Acceptable Indoor Air Quality

See Appendix K for approval status by the ASHRAE Standards Committee, the ASHRAE Board of Directors, and the American National Standards Institute.

The Standard is under continuous improvement by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including procedures for public comment, documented consensus action on requests for change to one part of the Standard. The change addenda form, instructions, and deadline may be obtained in electronic form from the ASHRAE website (www.ashrae.org) or in paper form from the Service Manager of Standards. The latest edition of an ASHRAE Standard may be purchased from the ASHRAE website (www.ashrae.org) or from ASHRAE Customer Service, 1801 Taylor Drive, Naperville, IL 60563-6200. E-mail: [standards@ashrae.org](mailto:standards@ashrae.org); Telephone: 630-659-8900; or call 1-888-541-7474 for the order or if you already have a previous purchase go to [www.ashrae.org](http://www.ashrae.org).

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## 4.4-6.3 Heating, Ventilation, and Air-Conditioning (HVAC) Systems

### 4.4-6.3.1 General

#### 4.4-6.3.1.1 Application

- (1) For small and medium-sized settings for residents with intellectual and/or developmental disabilities, see ANSI/ASHRAE Standard 62.2: *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings* for basic HVAC system requirements.
- (2) For large settings for residents with intellectual and/or developmental disabilities, see ANSI/ASHRAE Standard 62.1: *Ventilation for Acceptable Indoor Air Quality* for basic HVAC system requirements.



ANSI/ASHRAE Standard 170-2011  
Supersedes ANSI/ASHRAE Standard 170-2005  
Includes ANSI/ASHRAE addenda listed in Appendix F

## Ventilation of Health Care Facilities

See Appendix F for approval status by the ASHRAE Standards Committee, the ASHRAE Board of Directors, the ASHRAE Board of Standards, and the American National Standards Institute.

The Standard is under continuous improvement by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including procedures for public comment, documented consensus action on requests for change to one part of the Standard. The change addenda form, instructions, and deadline may be obtained in electronic form from the ASHRAE website (www.ashrae.org) or in paper form from the Service Manager of Standards. The latest edition of an ASHRAE Standard may be purchased from the ASHRAE website (www.ashrae.org) or from ASHRAE Customer Service, 1801 Taylor Drive, Naperville, IL 60563-6200. E-mail: [standards@ashrae.org](mailto:standards@ashrae.org); Telephone: 630-659-8900; or call 1-888-541-7474 for the order or if you already have a previous purchase go to [www.ashrae.org](http://www.ashrae.org).

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SOME ITEMS FROM FGI Section 2.4



# STANDARDS AND GUIDELINES

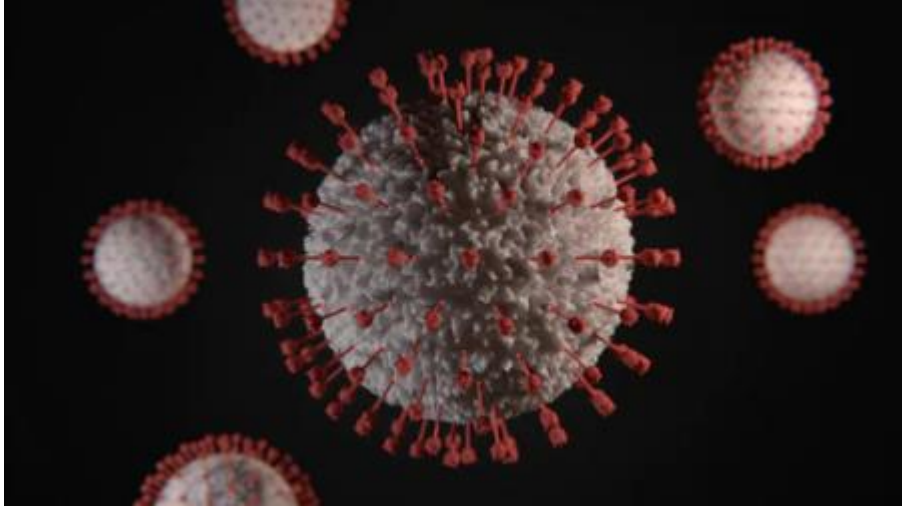


WELL measures a building's impact on *people*.



LEED measures a building's impact on *the environment*.

# Is there anything I can do to make surfaces resistant to SARS-CoV-2 (COVID-19)?



<https://www.epa.gov/coronavirus/there-anything-i-can-do-make-surfaces-resistant-sars-cov-2-covid-19>

Antimicrobials are considered pesticides and regulated by the EPA. The EPA puts forth the following:

EPA regulates the claims on pesticide product labels. EPA-registered surface disinfectants kill viruses at the time they are used. After use, if new viral particles come into contact with the surface, a previously applied disinfectant will not protect against these new particles.

EPA has not evaluated the efficacy of any products claiming long-lasting efficacy against viruses. Therefore, there are no EPA-registered products with label claims that they are effective against viruses over the course of hours to months (i.e., “residual” or “long lasting” efficacy claims).

There are some antimicrobial pesticides that EPA calls [materials preservatives](#) that can be incorporated into articles. Known as “[treated articles](#),” these plastics, textiles or other materials are treated with or contain a materials preservative to protect the article itself from mold or bacteria that can cause odor, discoloration or deterioration.

Treated articles cannot claim that they are effective against viruses and bacteria that cause human illness. This means that they are not appropriate for controlling COVID-19.

The Centers for Disease Control and Prevention (CDC) recommends that you clean contaminated surfaces with liquid disinfectant products to prevent the spread of disease. [Read CDC's recommendations.](#)



# Contact Transmission, Part 2: Materials, Design, and Cleaning

June 2019 - Issue Brief

SHARE

Web site for more information and tables:

<https://www.healthdesign.org/insights-solutions/contact-transmission-part-2-materials-design-and-cleaning>

Strategy	Commonly includes	Impact on surfaces
Self-disinfecting surfaces	Surfaces coated or impregnated with heavy metal	<p>Silver</p> <ul style="list-style-type: none"> <li>Silver has demonstrated a broad spectrum of antimicrobial activity against bacteria, fungi, and viruses. There have been positive results from the use of silver on medical devices and textile fibers (e.g., uniforms and privacy curtains) (Hicks et al., 2016; Monteiro et al., 2009; Ortí-Lucas &amp; Muñoz-Miguel, 2017).</li> <li>It has been suggested that the impregnation of silver into a coating can be more effective than direct surface coating alone.</li> </ul> <p>Copper</p> <ul style="list-style-type: none"> <li>Door knobs impregnated with copper have shown high corrosion resistance. However, actual hand contact has shown high corrosion rates and discoloration (Fredj, Kolar, Prichard, &amp; Burleigh, 2013).</li> <li>Antimicrobial copper objects were found to reduce microbial burden in a PICU study by Schmidt et al. (2016), but McQueen &amp; Ehnes (2018) expressed concerns about the effects of introducing NTDs in settings with antimicrobial metal surfaces.</li> <li>Bacterial contamination on standard curtains and complex element compound curtains (i.e., curtains treated with antimicrobial agents like silver) did not differ after 10 days following installation. Research suggests that cleaning and abrasion may render the metal less effective over time, requiring regular replacement (Schweizer et al., 2012).</li> <li>Copper-oxide-impregnated non-biocidal linens and pillow covers reduced the number of HAIs in a long-term care brain injury ward (Lazary et al., 2014).</li> <li>8 types of high-touch items made of copper alloys (e.g., door handles, toilet seats, grab rails, light switches, overbed tables, commodes) had significantly lower microbial counts compared with those made of standard materials (Karpanen et al., 2012).</li> </ul>
	Surfaces coated or impregnated with germicide	<ul style="list-style-type: none"> <li>Triclosan, while demonstrating antibacterial efficacy in synthetic polymers (Greenhalgh &amp; Walker, 2017), has recently come under scrutiny as a possible environmental and human health hazard (Dancer, 2014).</li> <li>Paints with quaternary ammonium compounds have been used to coat textiles, but seem to wear off with continued washing and show no activity against certain pathogens (Schettler, 2016). Quaternary ammonium molecules, combined with organosilanes (silicon chemicals), show conflicting results when applied to textiles or hard surfaces (Boyce, 2016).</li> <li>High-touch surfaces in patient rooms showed no significant antimicrobial activity after applying two organosilane products (Boyce, Havill, Guercia, Schween, &amp; Moore, 2014).</li> <li>A reduction in bacteria and antibiotic-resistant pathogens was found on ICU surfaces coated with similar antimicrobial agents (Tamimi, Carlino, &amp; Gerba, 2014).</li> <li>N-Halamine is another promising broad-spectrum biocide currently being incorporated into textiles and hard surfaces. To date, most testing has been done in laboratories rather than healthcare settings (2017). However, the treated textiles have been found to leave chlorine residue on the surface, resulting in stains and odors (McQueen &amp; Ehnes, 2018; Schettler, 2016).</li> </ul>

# TERMINOLOGY

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As used in various products marketed for use in building interiors.....

**Antimicrobial:** An **antimicrobial** is an agent that kills [microorganisms](#) or stops their growth. In contrast to antibacterial agents, antimicrobial substances offer a greater level of product protection by *continuously inhibiting* the growth of microbes on surfaces for very long periods of time. Typical active ingredients include [silver](#), copper or [zinc](#).

The term **antimicrobial** can be used in a variety of product claims across industries. As such, products that claim antimicrobial properties with a public or nonpublic health claim *must go through appropriate testing by product type to demonstrate efficacy and then approval by the Federal Environmental Protection Agency (EPA)*.

Further information on terminology:

<https://prismpub.com/in-the-know-the-difference-between-antimicrobial-antibacterial-and-microbicidal-coatings/>

# Why copper could help prevent future pandemic, and what it does to coronavirus

Updated Mar 20, 2020; Posted Mar 20, 2020



Copper has been shown to destroy germs much faster than other common



Advertisement

HOME NEWS NORTH AMERICA DIGITAL HEALTH MEDIA TALK PODCAST LATEST ISSUES

22 April 2020 11:10

## Anti-viral surface coatings could prevent the spread of Covid-19

## MICROBAN SILVER TECHNOLOGY

Discover the power of silver ion antibacterial technology in Microban SilverShield®.

REQUEST A FREE CONSULTATION TODAY

**inpro**  
**BioPrism® Solid Surface**  
**Engineered Antimicrobial Surfaces**  
 Erstes Kapitel lesen  
 Springer

**NANO GUARD X**  
 ANTIMICROBIAL DEFENSIVE COATING  
 NanoGuard X Creates a liquid glass barrier protecting against bacteria and virus contamination.  
 www.nanoguardx.com  
**ANTIMICROBIAL SURFACE COATING**

Introducing:  
**Antimicrobial Film**

Antimicrobial Treated  
**Switches and Wallplates**

**ANTIMICROBIAL PROTECTION FOR LAMINATES**  
 Microban® antimicrobial laminate protection creates clear, durable laminate surfaces for a range of environments.

# PAINITS AND COATINGS

paint.org/coatingstech-magazine/articles/antiviral-coatings-may-help-prevent-transmission-of-cov

Schluter® -DITRA &... (17) Pinterest SW Manually Retractable... Finelite HP-2 Wall... Chapter 10: M



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## Antiviral Coatings May Help Prevent Transmission of COVID-19

- The Microbicide is a “quaternary ammonium compound”

*Kills bacteria like staph and MERSA not Virus'*

**Paint Shield Microbicial Interior Latex Paint**

★★★★★  
1 Reviews | Write a Review

Paint Shield® is the first EPA-registered microbicial paint that kills greater than 99.9% of Staph (*Staphylococcus aureus*), MRSA (Methicillin-resistant *Staphylococcus aureus*), E. coli (*Escherichia coli*), VRE (*Vancomycin-resistant Enterococcus faecalis*) and Enterobacter aerogenes within two hours of exposure on painted surfaces. It continues to kill 90% of these bacteria even after repeated contamination on painted surfaces. The effectiveness lasts for up to four years as long as the integrity of the surface is maintained.

Learn more at [www.swpaintshield.com](http://www.swpaintshield.com)

Color	Options	Price
Color Name or Number:	Container Size:	List Price: \$71.99

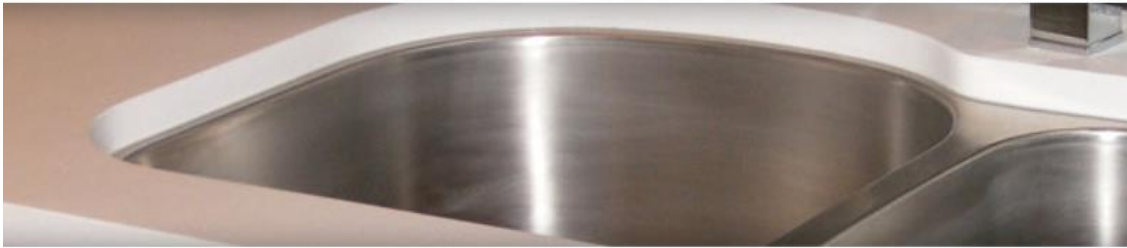
What about SarsCOV2?

<https://www.swpaintshield.com/pro/>

# TOUCHABLE SURFACES – WORKSURFACES – SOLID SURFACE MATERIALS



*choose a product >*



**AcryMed** by Meganite is an advanced antimicrobial acrylic solid surface material designed for use in healthcare environments. AcryMed has antimicrobial protection integrated into the solid surface sheet during production, protecting the product itself against stain and odor causing bacteria.

**\*Disclaimer:**

Tested 99.9%\* effective against Meganite selected bacteria in accordance with ISO 22196 and JIS Z 2801 testing standards. Results may vary when tested on different organisms or bacteria. The AcryMed technology protects the product itself against stain and odor-causing bacteria. AcryMed does not protect users or others from disease-causing bacteria.

# TOUCHABLE SURFACES – WORKSURFACES – PLASTIC LAMINATES



Search by product name or product number

Products

Applications

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Home ▶ High Pressure Laminate ▶ Wilsonart® HD®

## WILSONART® HD®

Wilsonart® HD® with Antimicrobial Protection and Enhanced Scratch & Scuff-Resistant AEON™ Technology

### • Silver Ion Technology

Wilsonart® HPL with Antimicrobial Protection incorporates a silver ion additive, which is registered by the EPA and helps protect the surface by inhibiting the growth of stain- and odor-causing bacteria, mold, and mildew. The silver ion technology used does not include nano silver particles.

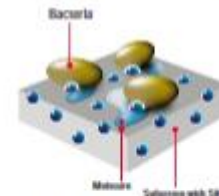
[https://issuu.com/wilsonart/docs/antimicrobial\\_product\\_sheet\\_final\\_0508?fr=sYTM0YjE4Mzg5MzY](https://issuu.com/wilsonart/docs/antimicrobial_product_sheet_final_0508?fr=sYTM0YjE4Mzg5MzY)



## Antimicrobial Product Sheet

Now, more than ever, we are aware of the things around us and the surfaces we touch. High touch surfaces include many different items from phones and doorknobs, to countertops and desk tops. It is now also more critical than ever that these surfaces are cleaned on a routine basis, using soap and water followed by a disinfectant.

To help protect the surface from frequent cleaning and disinfection protocols, Wilsonart® HPL with Antimicrobial Protection includes a silver ion antimicrobial agent that is registered with the EPA. This agent is built into the laminate to protect the surface by inhibiting the growth of stain and odor causing mold and mildew.



Silver ion technology works through rupture to attack bacteria. It does so by destroying the outer cell membrane. Once this is destabilized, cell respiration, food intake and cell division are inhibited.

### So, how does Antimicrobial Protection work?

Classified as a treated article where the additive is registered with the EPA, Wilsonart® HPL with Antimicrobial Protection utilizes silver ions (Ag+) encapsulated in glass beads. The antimicrobial action of silver is a fundamental material property with a long history of efficacy in the health and food service industries. Silver ion technology has demonstrated broad spectrum efficacy to control/eliminate the growth of microbes in a variety of applications. The antimicrobial activity of silver ion technology is believed to result from the ions' abilities to interfere with processes critical to cell function that eventually causes cell death.

Antimicrobial Protection works in combination with proper cleaning and disinfection practices to keep surfaces cleaner.

### Benefits of using Wilsonart® Laminates with Antimicrobial Protection include:

- Does not affect the appearance of the product.
- It is built into the product so it will not wash or wear away. It is active 24/7/365.
- Extends the useful life of the surface by controlling deterioration caused by mildew.
- Maintains its appearance by resisting stains caused by bacteria, mold, and mildew.
- Its silver ion antimicrobial agent makes it especially useful for use in high humidity areas.

Suitable for use on high quality residential and commercial countertops, furniture, fixtures and casework, Wilsonart® HD® and Premium Laminates also feature AEON™ Enhanced Scratch and Scuff Resistant Performance Technology for a surface that extends the usable life of your product, and is dramatically more durable than competitive laminates with similar finishes.

### Antimicrobial Protection Offering

**Wilsonart® HD® Laminates**  
Antimicrobial Protection comes standard in all Wilsonart® HD® Laminates. No upcharge or special order is required.  
<https://www.wilsonart.com/laminates/wilsonart-hd>

**Wilsonart® Premium and Standard Laminates**  
Antimicrobial Protection is available during the ordering process. A nominal upcharge, minimum order quantity, and factory lead times apply. Please consult your Wilsonart Representative for additional information.

<https://www.wilsonart.com/laminates/standard-l>  
<https://www.wilsonart.com/laminates/premium-dm-dg>



# INDUSTRY SPECIFIC CERTIFICATIONS

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FloorScore® is the most recognized indoor air quality (IAQ) certification standard for hard surface flooring materials, adhesives, and underlayments. Developed by SCS with the [Resilient Floor Covering Institute](#) (RFCI), a leading industry trade association of flooring manufacturers and suppliers, it qualifies for many green building schemes including **LEED v4, WELL, BREEAM, CHPS, and Green Globes.**

# SURFACES FLOORING

## Toxic chemicals widespread in vinyl flooring

The report also found that most vinyl flooring tested contained toxic phthalates, a number of which have been banned in children's products since 2009. The flooring

## Low-emitting flooring

One easy way we can help reduce exposure is by only using flooring that is independently certified for low VOC emissions. Products should meet one of these standards:

- a. FloorScore
- b. CA 01350 Standard

Effectively they are the same thing and are recognized by LEED as a means of contributing to low emitting material credits. Both methods are widely accepted in North America as well as Europe and other parts of the world.

The test methods measure air concentration of materials in controlled environments and look to detect and measure known VOCs as well as TVOCs (total volatile organic compounds).

Products meeting these certifications are known to off gas at safe levels.

## Home Depot and Lowe's Eliminating Toxic Phthalates in Flooring

low- or no-VOC [paints](#) and [the 2015 ban](#) Home Depot and Lowe's instituted in 2015 on toxic phthalates (a class of industrial chemicals that help make plastic bendy) in flooring.



# TOUCHABLE SURFACES – HARDWARE/HAND RAILS



**Kwikset** WITH **MICROBAN**  
ANTIMICROBIAL TECHNOLOGY

**Keep Your Door From Becoming a Science Project**

**BUY KWIKSET WITH MICROBAN**

[Why Microban](#) [Buy Kwikset with Microban](#) [Benefits of Microban](#) [FAQs](#)

**Kwikset Overprotects™ with Microban® Technology**



**ASSA ABLOY**

Anti-microbial



Anti-viral

# TOUCHABLE SURFACES – Hardware / Handrails



8300 Series Low Energy Power Operator



311H/L Push/Pull Latch



Touchless Actuators



190F Foot Pull

### Information Regarding Antimicrobial Coated Surfaces

In line with the CDC and World Health Organization, we believe thorough handwashing is incredibly important in prevention of spreading coronavirus. It's true that many of our products – like locks, exits and accessories – are available with an antimicrobial coating, which is specifically formulated to inhibit the growth of bacteria by interrupting cell multiplication.

However, it's important to understand that COVID-19 falls into the "virus" classification of infectious diseases. With this in mind, the antimicrobial coatings used are not proven to prevent it from spreading. These coatings, like others in the industry, use silver ions as an active ingredient. Silver ions are proven to be effective on inhibiting growth of bacteria, mold and mildew. However, they are not proven to kill these things or to be effective against viruses. Allegion makes no representations or guarantees, express or implied, as to the effectiveness of the antimicrobial coating in protecting against coronavirus.

# OTHER TRADITIONAL SURFACES – TILE, STONE

What about traditional materials,  
Tile and Stone?

## TCNA lab expands testing services

April 22, 2020

Home [◇ COVID-19](#) [◇ TCNA lab expands testing services](#)



Anderson, S.C.—Due to increased testing inquiries during the COVID-19 pandemic, the Tile Council of North America's (TCNA) Product Performance Testing Laboratory is expanding its microbiology-based services to meet the industry's growing and ever-changing needs for relevant, up-to-date product testing and analysis.

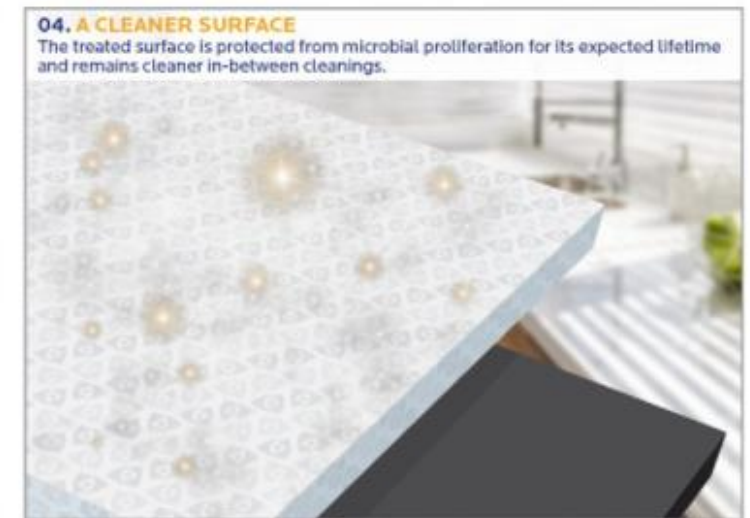
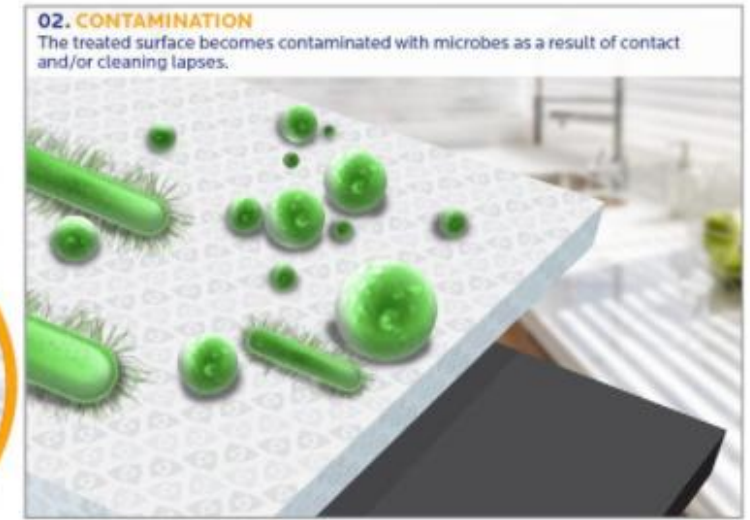
<https://marblerestore.com/tips-and-articles/the-coronavirus-and-your-stone-countertops/>



# ADDITIONAL SURFACES – THE TECHNOLOGY



- Insulation
- LVT Flooring
- Ceramic Tile
- Sanitaryware
- Faucets
- Drywall
- Bathroom Fixtures
- Countertops
- Window Shades & Screens
- Artificial Turf
- Metal Surfaces
- Door Hardware
- Floor Coatings
- HVAC Parts
- Sealants & Grouts
- Flooring Underlayment
- Plumbing Components
- Carpet
- Paint
- Hardwood Flooring



# ENVIRONMENTAL IMPACTS ?

"In our rush to attempt to destroy COVID-19, we could be increasing the chance that pathogens develop resistance to antimicrobials."

<https://www.buildinggreen.com/product-review/antimicrobials-building-products-covid-19-edition>

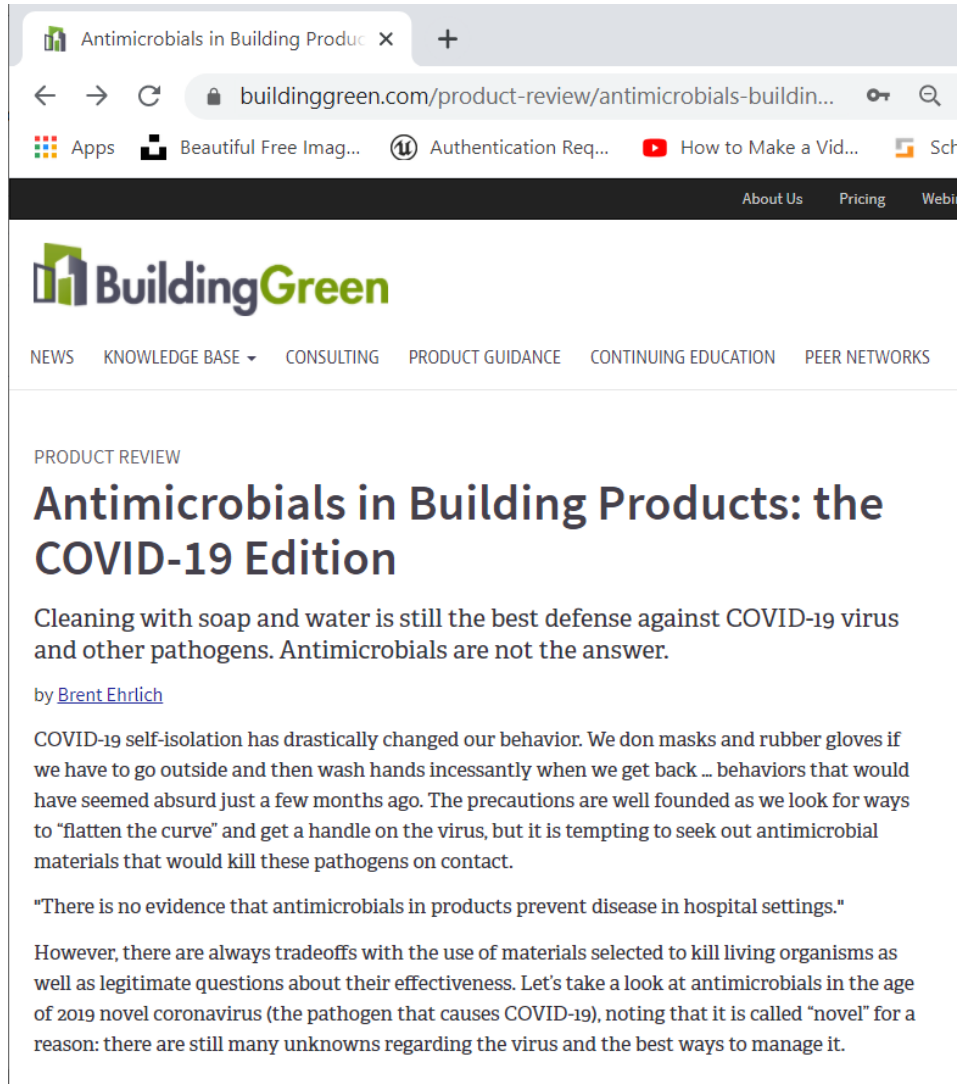
 KAISER PERMANENTE® | About

Home | Total Health | Health topics | Banning use of antimicrobial agents for infection control

December 11, 2015

## Banning use of antimicrobial agents for infection control

With no proof that antimicrobial-treated furniture and fabrics improve infection prevention, health care system bans 15 chemicals from use in interior products.



The screenshot shows a web browser window with the URL [buildinggreen.com/product-review/antimicrobials-building...](https://www.buildinggreen.com/product-review/antimicrobials-building-products-covid-19-edition). The page header includes the BuildingGreen logo and navigation links: NEWS, KNOWLEDGE BASE, CONSULTING, PRODUCT GUIDANCE, CONTINUING EDUCATION, and PEER NETWORKS. The article title is "Antimicrobials in Building Products: the COVID-19 Edition" by Brent Ehrlich. The text discusses the effectiveness of antimicrobials in building products and the impact of COVID-19 on behavior.

PRODUCT REVIEW

### Antimicrobials in Building Products: the COVID-19 Edition

Cleaning with soap and water is still the best defense against COVID-19 virus and other pathogens. Antimicrobials are not the answer.

by [Brent Ehrlich](#)

COVID-19 self-isolation has drastically changed our behavior. We don masks and rubber gloves if we have to go outside and then wash hands incessantly when we get back ... behaviors that would have seemed absurd just a few months ago. The precautions are well founded as we look for ways to "flatten the curve" and get a handle on the virus, but it is tempting to seek out antimicrobial materials that would kill these pathogens on contact.

"There is no evidence that antimicrobials in products prevent disease in hospital settings."

However, there are always tradeoffs with the use of materials selected to kill living organisms as well as legitimate questions about their effectiveness. Let's take a look at antimicrobials in the age of 2019 novel coronavirus (the pathogen that causes COVID-19), noting that it is called "novel" for a reason: there are still many unknowns regarding the virus and the best ways to manage it.

# ANTI-MICROBIAL COMPOUNDS AND THE ENVIRONMENT



- A. DuPont™ Corian® solid surface meets the high expectations of the most demanding healthcare environments. Corian® is:
- Easy to clean and maintain. With proper cleaning, Corian® solid surface does not support the growth of mold, mildew, and bacteria.
  - A nonporous surface with a smooth, seamless appearance, therefore not allowing dirt and germs to penetrate within the surface, or hide in crevices and seams, typically present with other materials.
  - GREENGUARD Listed (UL) for microbial resistance.  
UL Environment lists specific products that have been found to be microbially resistant when tested according to a test method following the guidelines of ASTM D 6329 and analyzed with a quantitative scale.
  - NSF/ANSI Standard 51 Certified for Food Contact.  
Corian® solid surface sheet and shape materials are NSF/ANSI 51 Certified to the highest level, for food contact, for all food types.



FACT SHEET

## UL GREENGUARD Certification Program

Products that have achieved GREENGUARD Certification are scientifically proven to meet some of the world's most rigorous third-party chemical emissions standards, helping to reduce indoor air pollution and the risk of chemical exposure.





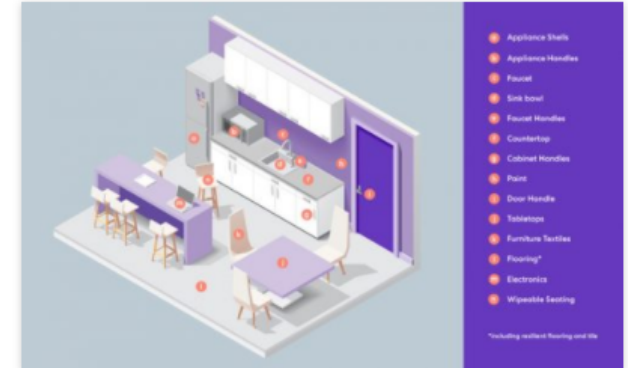
## Perkins and Will advises against the use of antimicrobial building products

June 2, 2020

Perkins and Will and the nonprofit Healthy Building Network (HBN) reiterate building products with antimicrobial treatments have not been proven to be a safe or effective means of controlling the spread of COVID-19.

The organizations recently issued a joint statement reaffirming the conclusion of their March 2017 white paper on antimicrobial building products that concluded antimicrobial additives have not been proven to have the health benefits they promote, and alternatives should be sought wherever possible.

“We have been receiving an uptick in questions from clients and colleagues across every sector about how to prevent the spread of pathogens like SARS-CoV-2, which is the virus that causes COVID-19, in the built environment,” said Mary Dickinson, associate principal of the Material Performance Lab at Perkins and Will. “As champions of material health and transparency, we knew a part of our response needed to address the questions surrounding the use of materials with antimicrobials. While we published a robust white paper on the matter in 2017, we needed to ask if the science and governmental feedback was still valid under the current circumstances. It was important to put out research-backed guidance and best practices on this matter as soon as possible.”



Antimicrobial building products may do more harm than good, even during a pandemic, say Perkins and Will and the nonprofit Healthy Building Network.

*Image courtesy Perkins and Will*

<https://dev.perkinswill.com/news/covid-19-why-we-and-the-healthy-building-network-advise-against-using-antimicrobial-building-products/>

# ADDITIONAL CONSIDERATIONS



The Flip Side...



Psychology ? FALSE SENSE OF SECURITY!!!!

Anti-microbial



SELF CLEANING



## SUPER-BUGS



Environmental Impacts

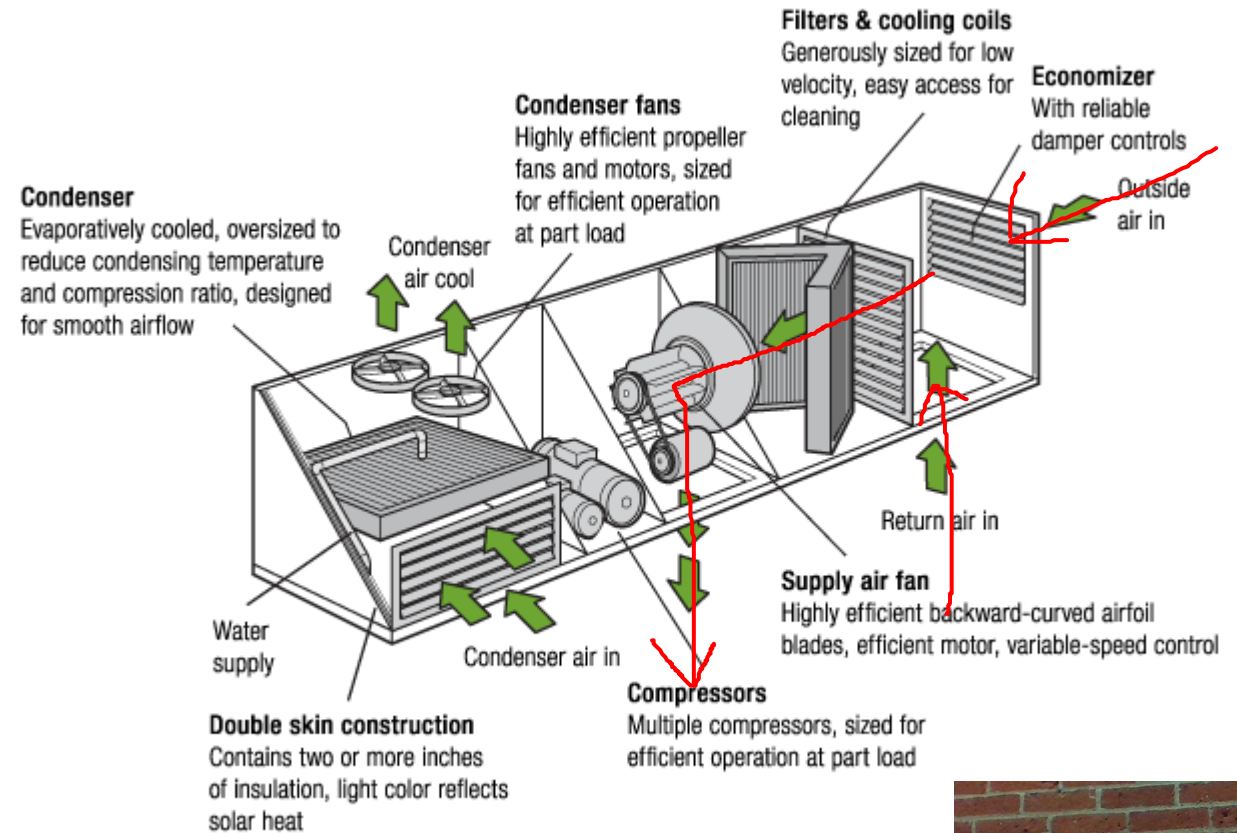
# WHAT IS THE ROLE OF HVAC?

-HVAC System moves air and contents of the air including dust and viruses.

-The system conditions “treats” the air adding heat (heating) or removing heat (cooling).

-The system also cleans the air through use of filters.

-Contaminants in the airstream are diluted through the introduction of ventilation air.



# HVAC AND COVID-19



-The HVAC systems interaction with COVID-19 can be broken down into five points for consideration.

- Ventilation
- Filtration
- Humidity Control
- Disinfection
- Operations and Maintenance

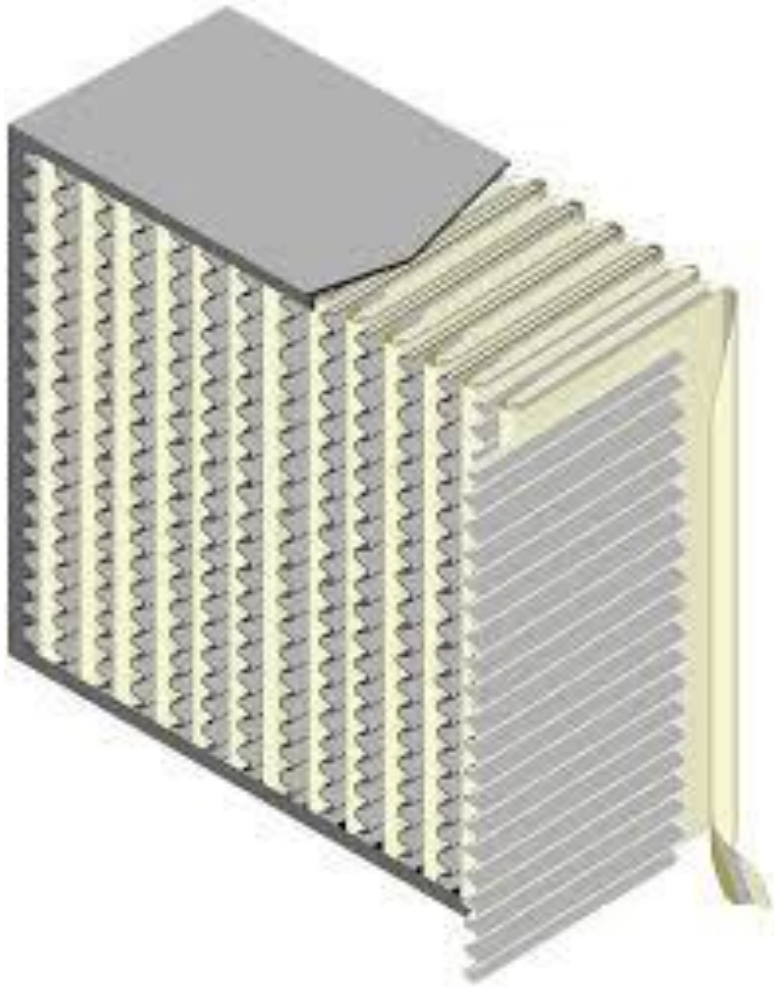


# HVAC AND COVID-19: VENTILATION

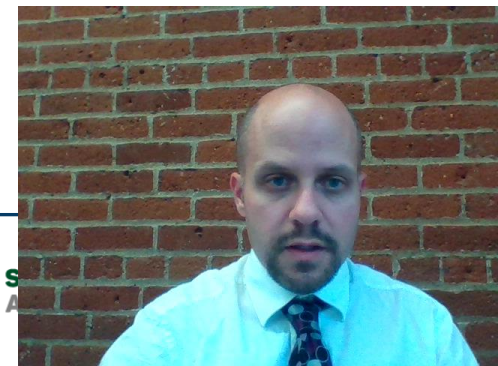
- The HVAC system introduces outside air into the airstream. The ventilation rates are determined by building codes.
- Increasing outdoor air dilutes the concentration of airborne SARS-CoV-2.
- Minimum ventilation rates have not been established specific to SARS-CoV-2 transmission.
- Increased or functional ventilation systems will benefit the occupants for the life of the building. COVID notwithstanding ventilation is an excellent investment of time and money.



# HVAC AND COVID-19: FILTRATION



- HVAC systems include a filter to remove contaminants from the airstream. Filters are rated based on the MERV (Minimum Efficiency Reporting Value) scale. The MERV scale is from 1-16.
- The higher the MERV rating the more particulate the filter can remove. However higher MERV ratings result in more fan energy and can adversely impact the operation.
- The majority of “comfort HVAC systems” are designed for MERV 8 filters.
- Filters with MERV ratings from 13-16 are recommended for controlling virus and droplet nuclei. Filters with these MERV ratings are common in hospitals and cleanroom applications.



# HVAC AND COVID-19: HUMIDITY CONTROL

-The HVAC system can introduce humidity into the building if equipped with humidifier.

-Viruses including coronavirus survive longer in dry environments.

-ASHRAE (formerly the American Society of Heating and Refrigeration Engineers) recommends indoor relative humidity of 40-50% rh in the winter.

-Be aware of the limitations of the building envelope when applying humidification. Excess humidity can cause mold and mildew.



# HVAC AND COVID-19: DISINFECTION

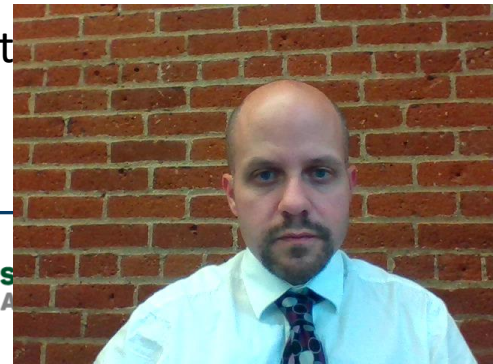


-HVAC systems can include methods to disinfect the airstream. Ultra Violet Lamps and Bi-Polar Ionization are popular products.

-These systems can supplement or supplant increased MERV rated filters. They are a potential alternative for units which can not support high efficiency filters.

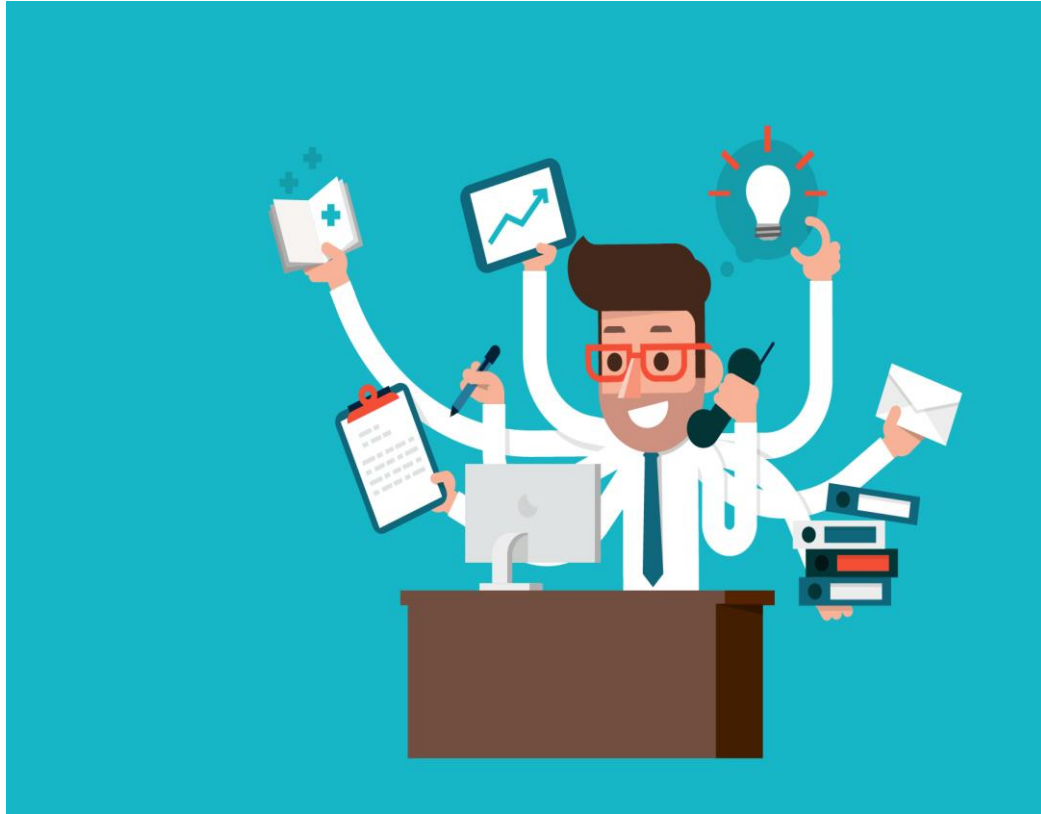
-Air can be disinfected with UVC radiation. The technology has been in use for many years. They are commonly referred to as “germicidal lamps”. Application is critical with UVC as physical space is required for proper application of the technology. Retrofit can be challenging.

-Bi-Polar ionization works by passing air through an electrically charged field. Contaminants in the airstream are neutralized. Product selection is critical. There are many technologies available and they are not all equal in effectiveness. Bi-Polar is easier to retrofit t





# APPLYING THESE POINTS TO SENIOR CARE FACILITIES



-The points presented can be applied specifically to the HVAC systems that are common in senior living.

-Typically individual resident spaces have a smaller HVAC system such as a PTAC unit (Packaged Terminal Air Conditioner) or heat pump.

-Larger common and gathering spaces may have a large RTU (Rooftop Unit) or AHU (Air handling unit).



# SMALL HVAC IN SENIOR CARE FACILITIES

-These smaller systems tend to be located in the individual resident rooms.

-Because they are smaller scale equipment they can not accept a high efficiency filtration or increased ventilation beyond their design parameters.

## Recommendations:

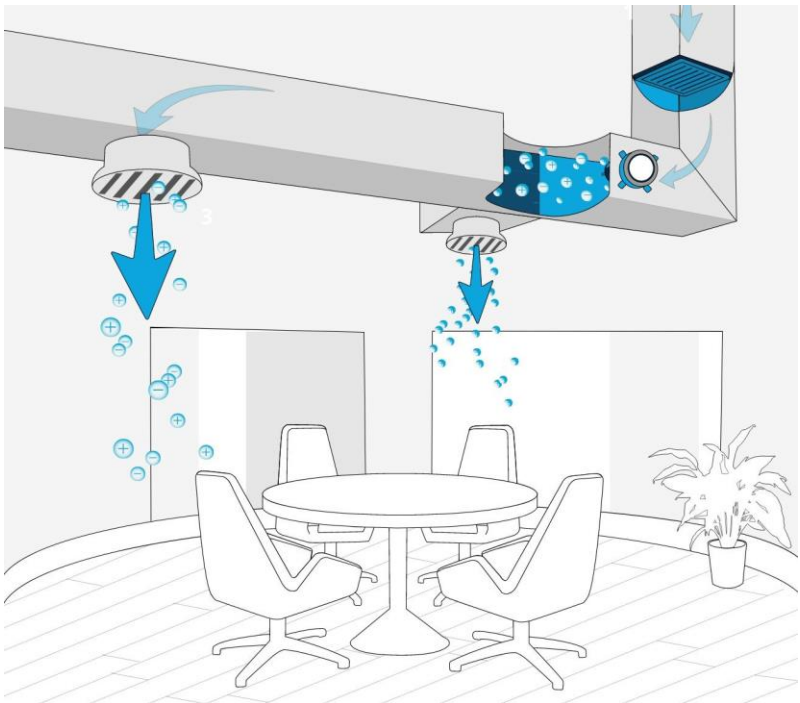
-Clean the equipment and filters as frequently as possible. Verify ventilation doors are open.

-Consider installing stand alone HEPA filtration units. True HEPA units include 99.97% efficient filters.

-Discharge air away from people and surfaces.



# PTAC OPTIONS



# ACOUSTICAL CEILINGS AND HVAC OPTION



EXAMPLE: The Armstrong VIDASHIELD UV24 System pairs a UV-C Air Purifier with ULTIMA Health Zone or SCHOOL ZONE Fine Fissured ceiling panels,



**VIDASHIELD OVERVIEW**

<https://www.armstrongceilings.com/commercial/en/performance/defend-portfolio.html>

# LARGE HVAC IN SENIOR CARE FACILITIES

-Larger systems are more prevalent in common areas such as dining, games, or crafts.

## Recommendations:

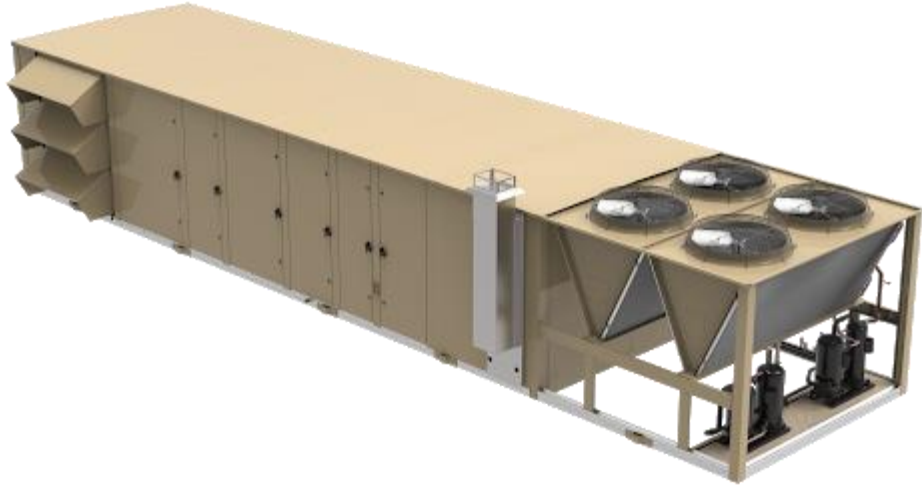
-Most units have a 2" filter rack which will accommodate MERV-13 filters. Verify with unit manufacturer that the system can perform with increased level of filtration.

-Operate the unit in occupied mode 24/7 and temporarily bypass Demand Control Ventilation strategies.

-Engage a TAB contractor to verify the outside air flow and identify proper operation of the system.

-Clean the equipment and replace filters as frequently as possible

-Consider adding UVC lights or Bi-Polar ionization in addition to high efficiency filtration.



# JUST OPEN SOME WINDOWS (?)



## CONSIDERATIONS AND IMPACTS TO HVAC

- 1 OUTDOORS MAY BE EXTREME HEAT/COLD
- 2 OUTDOOR MOISTURE AND CAPACITY TO REMOVE
- 3 MONITOR IMPACTS ON SPACE
- 4 ALTERNATIVE – OPERATION MODE

# MAINTENANCE AS A PRIORITY

## IMPORTANCE OF HVAC MAINTENANCE



<https://www.npr.org/2020/08/20/903553988/as-we-return-to-work-and-school-during-the-pandemic-can-the-air-inside-be-kept-s>

# HVAC AND COVID-19: OPERATIONS AND MAINTENANCE

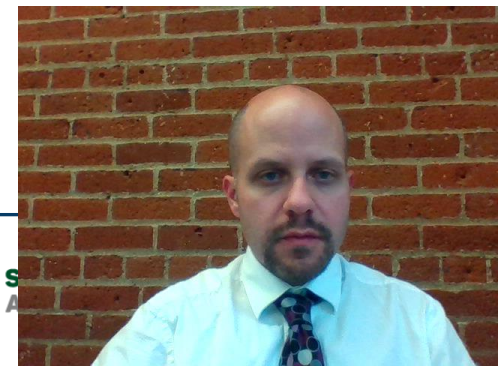
- Ventilation air is important in reducing transmission of COVID through HVAC.
- Consider operating systems in occupied mode 24/7 during the pandemic. Systems will introduce ventilation air continuously.
- Consider temporarily bypassing energy saving strategies such as Demand Controlled Ventilation.
- Engage a TAB (Test, Adjust, Balance) contractor to verify the system outside air flows.
- Thoroughly clean HVAC systems with special attention to cooling coils and traps.
- Increase filter change schedule.





# HVAC AND COVID-19 SUMMARY

- The transmission of SARS-CoV-2 through HVAC systems has not been fully studied or understood. Concepts and recommendations will continue to evolve.
- The industries guidance is based upon past experience drawing heavily from healthcare guidelines.
- Be aware of the potential pitfalls when applying any recommendations. Increases in energy costs and wear on equipment can be expected.
- Ventilation air is always a great place to start. Ensuring proper ventilation and functioning systems is an excellent investment of time and money which will serve the occupants well even after COVID.**



# DESIGN & BUILD / RENOVATE THOUGHTFULLY

CAREFUL MATERIAL / PRODUCT SELECTION

LOW VOC

NON-TOXIC / NO – FORMALDEHYDE

CLEANABLE (AND DURABLE) HARD SURFACES

DAYLIGHTING AND VIEWS

ACOUSTICS

VENTILATION / HVAC



# SELECT MATERIALS AND DESIGN SYSTEMS AND SPACES THOUGHTFULLY



## Select material/product selection with care

- Composition:
  - Low VOC
  - Non-toxic/no formaldehyde
- Durable and cleanable hard surfaces:
  - Use/not use integral anti-microbials
  - Consider acoustics



## Control infection transmission through HVAC systems

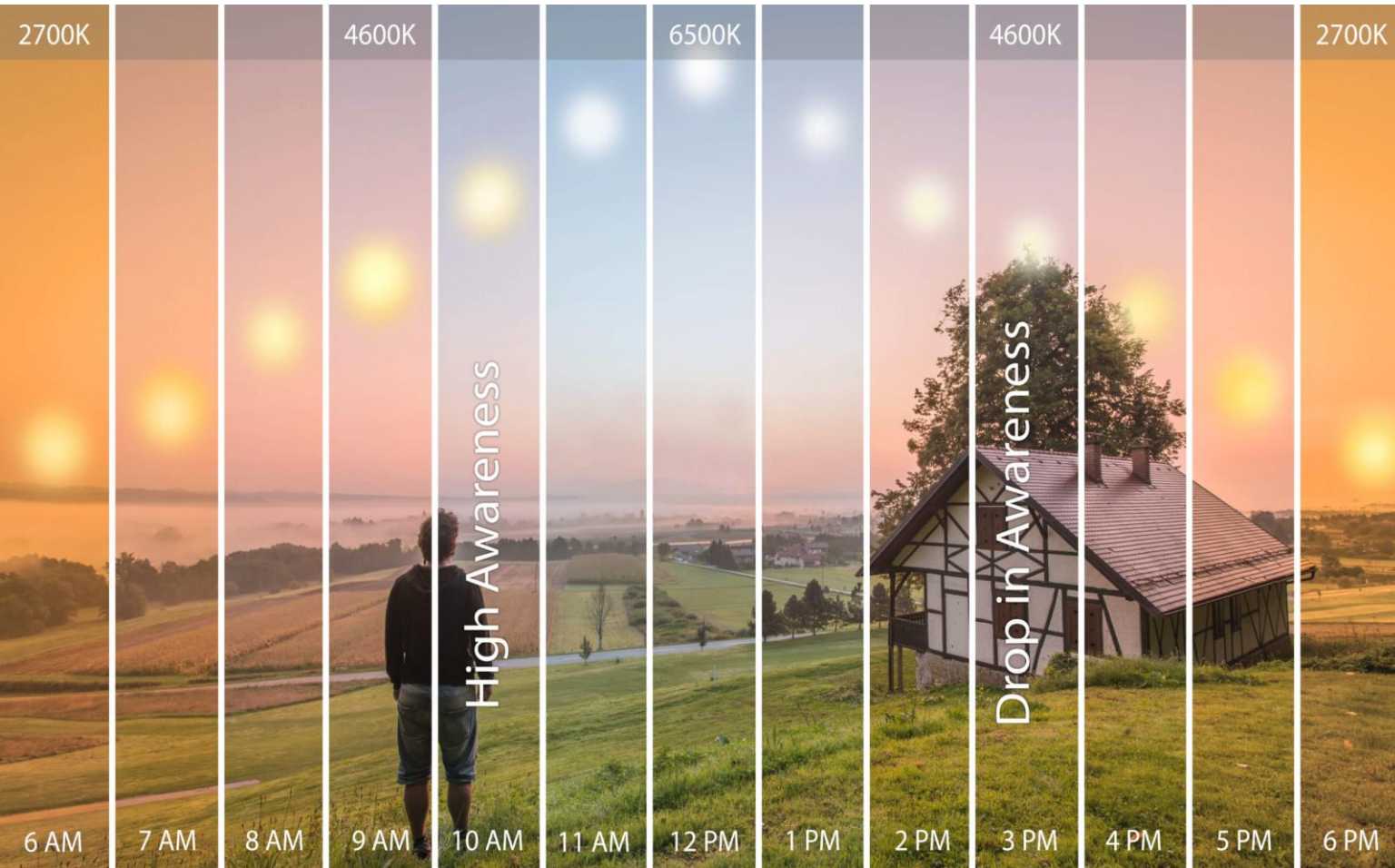
- Ensure your system addresses:
  - Ventilation
  - Filtration
  - Humidity control
  - Disinfection
  - Operations and maintenance



## Integrate daylighting and views

- Daylighting and views to outdoors
- Natural circadian rhythm
  - Can be imitated through careful lighting schemes

# LIGHTING AND CIRCADIAN RHYTHMS



BRIGHTNESS  
COLOR

100%	5000K	<b>FOCUS - Daylight</b>
100%	3000K	<b>COMFORT - Warm Light</b>
90%	3000K	<b>RELAX - Sunset Glow</b>
5%	2000K	

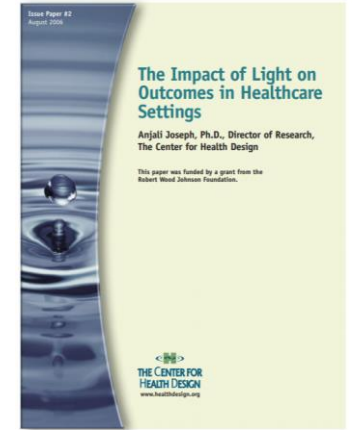
Customize the mood of your home, transitioning from *Daylight* to *Sunset Glow* using your existing dimmers.

# DAYLIGHT, VIEWS, AND OUTDOOR SPACES

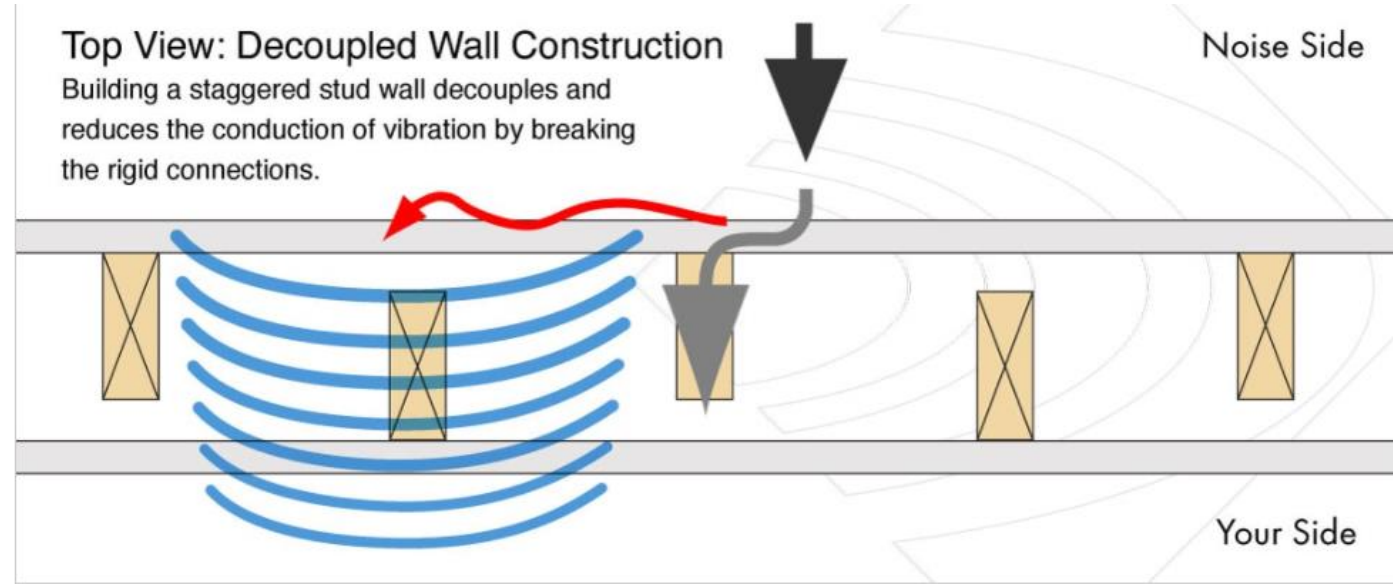


Important factors to occupant health:

- Daylight
- Views
- Outdoor spaces

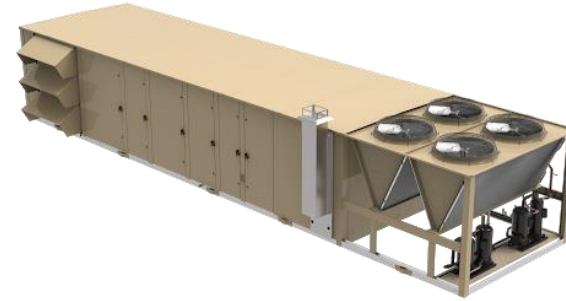


# ACOUSTICS WALLS & CEILINGS



# HVAC AND VENTILATION

- Ensure your system addresses:
  - Ventilation
  - Filtration
  - Humidity control
  - Disinfection
  - Operations and maintenance



# RESOURCES AND REFERENCES

## Environmental Impacts

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- Gonchar, J. (2020, May 20). *New report questions antimicrobial treatments in building products*. Architectural Record. <https://www.architecturalrecord.com/articles/14640-new-report-questions-antimicrobial-treatments-in-building-products>
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# RESOURCES AND REFERENCES

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## Selected Listing of Additional Information on Environmentally Friendlier Products

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- Sherwin-Williams. (n.d.). *Green programs and VOC regulations*. <https://www.sherwin-williams.com/painting-contractors/specifications/progs-and-specs>