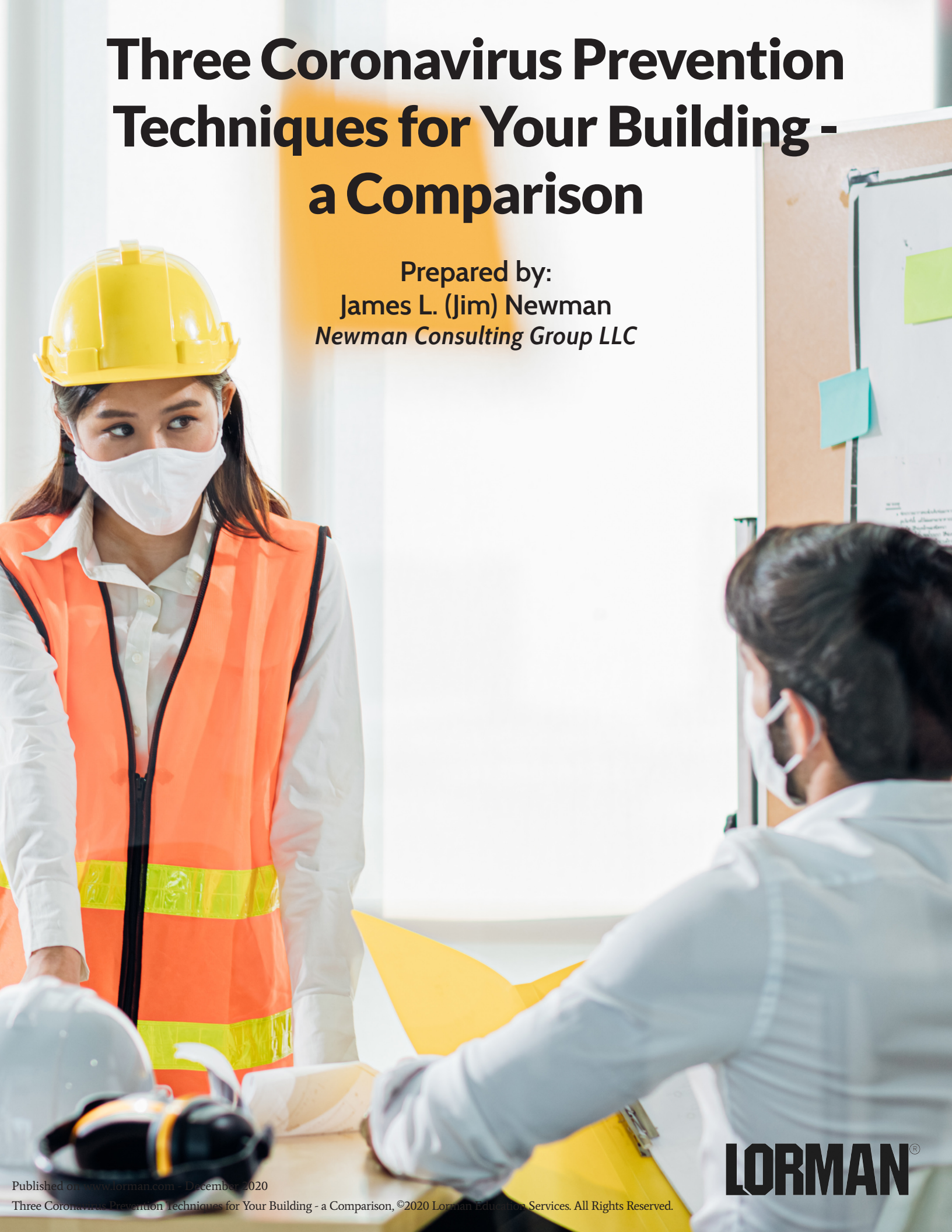
Three Coronavirus Prevention Techniques for Your Building - a Comparison

Prepared by:
James L. (Jim) Newman
Newman Consulting Group LLC



Published on www.lorman.com - December 2020

LORMAN®

Lorman Education Services is a leading provider of online professional learning, serving individuals and teams seeking training and CE credits. Whether you're looking for professional continuing education or an enterprise-wide learning and development solution, you will find what you need in Lorman's growing library of resources.

Lorman helps professionals meet their needs with more than 100 live training sessions each month and a growing collection of over 13,000 ondemand courses and resources developed by noted industry experts and professionals.

Learn more about Lorman's individual programs, economical All-Access Pass, and Enterprise Packages:

www.lorman.com

Three Coronavirus Prevention Techniques for Your Building - a Comparison

Written by Jim Newman

(updated chart, 11/23/20) As those of us in the building management and maintenance field prepare to "re-open" buildings, the health and safety of our tenants, guests, patients, staff and residents remains top-of-mind. Soon the general public will leave the comfort and safety of their homes where they have been limiting human contact for weeks, and venture out into the world with other people.

We must be prepared for them so they can feel safe when returning to shop, work and play in "the new normal."

Nothing about building maintenance will be normal – perhaps for quite a while. Every commercial building in the US and probably in most industrial nations, is now taking – or should be taking – extra precautions to ensure safety. People should feel safe going back to work, and building owners and managers must enact measures to both ensure safety and prevent, or at least minimize, potential litigation.

In addition to CDC, OSHA and WHO guidelines, we have information from industry experts at ASHRAE, BOMA and others. Other respected organizations, such as facility management firms JLL, CBRE and others have issued their own guides for preparing your building before returning to "business as usual" at your location.

New cleaning procedures and hygiene supplies are essential to protect against infection from direct contact with surfaces.

Because the virus is also transmitted through droplets in the air, ensuring better indoor air quality (IAQ) to help prevent the spread of COVID-19 is also critical. For this, we look to various air filtration and disinfecting systems. The most commonly used include HEPA (High Efficiency Particulate Air) Media Filtration, UV (Ultra-Violet Light) Purification and Bi-Polar Ionization.

These popular systems do have some features in common, but in practice are very different:

- HEPA Filtration and Bi-Polar Ionization are proven to reduce particulate levels. Neither one uses harmful chemicals or creates a by-product so that is definitely a plus. Adding extra filters, as required with HEPA systems, can reduce airflow due to increased resistance in the system. This can cause HVAC systems to work harder to maintain the same airflow as before, and therefore use more energy and cost more money.
- Bi-Polar Ionization and UV Light are both easily installed without having to re-engineer the system, and they both treat contaminants. UV light, however, is only effective if the contaminants pass close enough to the light field for a sufficient period of time, and it needs to be the proper type of UV light, i.e., UV-C. The amount of time spent in close proximity to the light is very important to the effectiveness of the UV radiation. Unfortunately there is no way to guarantee that all air will pass close enough to the light for the UV light to be sufficiently effective.
- One of the primary manufacturers of bi-polar ionization equipment, AtmosAir, has a system with patented technology to treat the source of contamination without

restricting airflow. This system is effective against particles as well as bacteria, spores, volatile organic compounds (VOCs) ***and*** **viruses**.

As recently as last month, publications have been citing this technology for its employability as an effective COVID Prevention Technology, as seen in Center for Active Design, and Business Insider.

Even Gensler, the largest A/E firm in the world, is installing this same system in their own buildings. See what they are doing here, and pay special attention to point #4, "Invest in air-cleaning systems to protect collaborative environments."

Comparison of Indoor Air Cleaning Technology Upgrades[1,2] - Rev. 11/21/20 ©

Attribute	Traditional Technologies			Newer Technologies			Advanced Technologies[3,4]	
	Higher MERV Media Filters	Chemical Filtration	Scent Generation[5]	Polarized Media Air Cleaner	Ultraviolet Germicidal Irradiation (UVGI or UV-C)	Photocatalytic Oxidation (PCO)	Bi-Polar Ionization (BPI)	Needlepoint Bi-Polar Ionization (NBPI)
Inactivates Viruses	No	No	No	No	Yes	Yes	Yes	Yes
Inactivates Bacteria and Other Germs	No	No	No	No	Yes	Yes	Yes	Yes
Captures VOCs	No	Yes	No	Yes	Varies with Mfr[6]	Varies with Mfr[6]	Yes[6]	Yes[6]
Reduces Particles in Space	Yes	Yes	No	Yes	No	No[6]	Yes[6]	Varies with Mfr[6]
Reduces Odors	No	Yes	Yes	Yes	Varies with Mfr	Varies with Mfr	Yes	Yes
Produces Ozone	No	No	No	No	No[7]	Varies with Mfr	Varies with Mfr	Varies with Mfr
Complies with UL Standard 2998 for Zero Ozone Emission from Air Cleaners	N/A	N/A	N/A	N/A	Varies with Mfr	Varies with Mfr	Varies with Mfr	Varies with Mfr
Produces Other Chemical Byproducts	No	Yes	Yes	No	No	Yes	Varies with Mfr	Varies with Mfr
Requires Contaminant Travel through a Filtration System	Yes	Yes	N/A	Yes	Yes	No	No	No
Typical Life of Major Filtration Component[8]	2-6 Months	3-12 Months	Monthly	2-5 Yrs	1 Yr	1 Yr	2 Yrs	7-10 Yrs
Generates Low Pressure Drop	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Requires Re-sizing of Existing Fan Motors	Maybe	Yes	No	No	No	Maybe	No	No
Impact on Fan Energy	Increases	Increases	None	Decreases	None[9]	None[9]	None[9]	None[9]
Third-Party Testing for Other Performance Metrics	Yes	Yes	N/A	Varies with Mfr	Varies with Mfr	Varies with Mfr	Varies with Mfr	Varies with Mfr

Notes

1 Based on 2020 review of manufacturers' data performed by Newman Consulting Group, LLC. Information provided for general purposes only. No guarantee of suitability or applicability is implied.
2 Airflow patterns in the space can significantly affect the performance of air cleaning devices and strategies.
3 Limited independent, third-party test results available for emerging technologies. Due diligence and caution should be exercised before selecting these technologies.
4 Some manufacturers suggest energy savings are available with reductions in outside air quantities. Reductions in outside air quantities below code require minimums requires prior approval of the authority having jurisdiction (AHJ) and are not recommended.
5 Scent generators do not clean the air. Instead they add scents to mask odors. This can cause additional problems for occupants with certain sensitivities and is not recommended.
6 PCO, BPI and NPBI do not capture particles or VOCs. They impart a charge to them, causing them to agglomerate into larger particles that are more easily captured by accompanying media filters.
7 Properly designed UV-C does not produce ozone. Other types of ultraviolet technologies such as UVV (Vacuum UV), UV-A and UV-B do produce ozone and are not recommended.
8 Regardless of major component life, all air purifying devices require quarterly, semi-annual and annual maintenance checks.
9 No impact on fan energy when used in conjunction with existing media filtration.

This grid compares various types of equipment designed to improve air quality in buildings. Only some eliminate viruses, bacteria and other germs.

The reasons stated above and the information in this table have helped us make the decision to present the AtmosAir system as the most effective system to help reduce air-carried bacteria and viruses in indoor settings.