CREATING CLEANER LEARNING SPACES

MAINTAINING CLEAN EDUCATION ENVIRONMENTS USING UV LIGHT

Facts, myths, and tips on using ultraviolet light technology to disinfect classrooms

VIEWPOINT

Schools In FOCUS PODCAST

This interview originally took place as a *Schools in Focus* Podcast. To listen to the episode, click here. You can subscribe to the ***Schools in Focus*** Podcast on iTunes, Stitcher and Google Play.

PRODUCED BY
spaces4learning

SPONSORED BY
LEVITON®

INTRODUCTION: Today's topic is "Creating Cleaner Learning Environments." Disinfection techniques that help make classrooms safe for students, teachers and staff are still top of mind. Here to discuss some of the benefits of ultraviolet light disinfection are Bruce Ramsay, Brand Manager for Visioneering, and Tim Stevens, Director of Product Management for Certolux. We'll touch on topics like facts and myths about UV light, the role of UV light in maintaining clean education spaces, the challenges that education professionals should be aware of when purchasing UV light technology, and the technology's benefits for end users in educational facilities. This episode of *Schools in Focus* is sponsored by Viscor, a Leviton company.

SPACES4LEARNING: Hi everybody, and welcome to Schools in Focus. Today, our guests are Bruce Ramsay, the Brand Manager for Visioneering, and Tim Stevens, the Director of Product Management for Certolux. Bruce, Tim, thanks a lot for being here! First of all, can you tell us a little bit about yourselves?

Bruce Ramsay: Sure. Tim, if you don't mind, I'll go first. As you said, my name is Bruce Ramsay. I am the Brand Manager at Viscor, a Leviton company. And I've been with Viscor for over nine years now. I started initially as the marketing manager, and in that previous role, I really became fascinated with our portfolio, and the entire product development cycle. So, when the opportunity presented itself to take up the brand management role, with a focus specifically on our Visioneering product line, it was a really easy transition. Now, I'm really focused on all things product—how to bring more value to our existing product portfolio while also bringing new products to the market that our customers really need.

Tim Stevens: And I'm Tim Stevens, and I'm the Director of Product Management for Certolux, which is a brand of Viscor dedicated to the lighting of technical spaces such as clean rooms and healthcare. I started my engineering career at Underwriters Laboratories and have developed lighting fixtures for spaces that value cleanliness, spaces like medical and pharmaceutical research.

"If you were to ask an average person 20 years ago, they'd probably say the role that light plays in creating cleaner spaces is a reference to the function of light itself—you know, helping us see. Obviously, a well-lit space makes it easy to see the difference between clean and dirty surfaces. But fast-forward to today, and if you ask that question now, people are becoming a lot more aware of the uses of UV light as a source of disinfection."
— Bruce Ramsay

S4L: For listeners that don't know a lot about Viscor or Leviton, could you tell us a little about the company and the brand?

Bruce: Sure. So, Viscor's been a North American manufacturer of quality lighting solutions for over 60 years now. We started in Toronto, Canada; we're still here in Toronto, Canada, in a state-of-the-art, quarter-million-square-foot head office and manufacturing plant. And really, over the years, as most manufacturing started shifting to offshore operations, we really prided ourselves on maintaining local, North American manufacturing. And that decision has really been the cornerstone of our identity. It allowed us to provide industry-leading turnaround time, customization that meets our customers' needs, as well as our really responsive customer service model. And with everything that's happened in the global climate, we see that manufacturing landscape

has changed. And now, more and more companies are trying to come back to local manufacturing to avoid offshore challenges. Through that time, we've also been experts at integrating technology into our portfolio, similar to the 365DisInFx UVA technology, which we will get into a little bit later.

But when we became a part of the Leviton Lighting Controls family back in 2019, it really gave us full access to the Leviton family of controls. And Leviton is a globally recognized company and brand. They were established as an American manufacturer of electrical wiring equipment back in 1906, and since then, Leviton has grown to become a global provider of electrical,

networking and lighting solutions, just to name a few. But over that 115-year period, I think it's safe to say that every American has knowingly or unknowingly come across some Leviton product or solution in their lifetime.

S4L: Our main topic of conversation today is creating cleaner learning environments. What role does light play in maintaining cleaner educational spaces?

Bruce: So, that's a great question, right? If you were to ask that question 20 years ago to an average person, they'd probably say the role that light plays in creating cleaner spaces is a reference to the function of light itself—you know, helping us see. Obviously, a well-lit space makes it easy to see the difference between clean and dirty surfaces. But fast-forward to today, and if you ask that question now, people are becoming a lot more aware of the uses of UV light as a source of disinfection.

And the research behind UV light dates back to the late 19th century, and the initial uses were to cure bacterial infections and to treat water. But there were limited instances of commercial use due to lack of research and confidence around the safety for UV disinfection. But over the years, we see more and more systems have been developed to use UV as not just disinfecting for water or treating of infections, but to actually address disinfecting complete spaces. UVC light technology specifically was introduced as a very effective way to disinfect spaces; those processes usually involved expensive machines and qualified operators who would conduct cleaning outside of the regular operating hours—for safety purposes.

But more recently, UV lights that were found in those devices, they've been replaced with UV-LED chips, which provide a lot more control over the technology itself. And with the introduction of LED technology, now we have more solutions that are appropriate for educational spaces—like our DFX Lumineers, for instance.

S4L: Delving into that just a little bit further, exactly how does UV lighting technology disinfect spaces and surfaces?

Tim: That's another great question. Well, the human eye can see light between 400 and 750 nanometers. And I know we're talking science here. Below 400 nanometers is considered ultraviolet, or UV, light, which is broken into three sections. The first section is called UVA and goes from about 400 to about 320 nanometers. UVA can be used to kill bacteria. It does this by causing a photochemical reaction within the bacteria itself. Basically, the pathogen absorbs the energy from the UVA light, which causes defects and prevents them from replicating, and eventually leads to the inactivation or death of that bacteria cell. An even greater photobiological reaction can be seen in the shorter wavelengths, like UVB and UVC, which is responsible for sunburns and things like that. But UVC technology, as Bruce has mentioned, was developed for doing even more disinfection that's much more powerful. Our solutions focus on UVA because we have found a great balance between being effective at disinfection while also being appropriate for continuous use in occupied spaces such as classrooms, hallways and so on. So, 365DisInFx UVA technology is based on light that's just outside the visible spectrum of humans. And that's how it works.

S4L: And then, can you tell me a little bit more about some of the advantages of UVA in particular?

Bruce: So, you know, specifically our DFX series, which features 365DisInFx UVA technology, it represents a solution that can support cleaner spaces without having to pay for the expensive equipment or the dedicated staff that we mentioned before that is traditionally associated with UVC sources. It also represents solutions that can be used during the regular hours of operation. So even when the space is occupied—and that's a huge advantage in cost savings, because these solutions are actually embedded in the ambient light fixtures rather than in a machine dedicated to just cleaning. So, you already have the fixtures there lighting the space. Why not kill two birds with one stone?

And, of course, they provide that continuous cleaning, which is a lot more effective than periodic cleaning that comes with UVC solutions. If you were

to look at a lecture hall, for example, after a final lecture concludes, you could schedule a UVC cleaning crew to come in and sterilize the space. The following morning, the space is going to be used for more lectures. Each student is gonna introduce new pathogens. Between the next UVC cleaning cycle, which could be scheduled days away, hundreds of students are gonna use that same space, introduce, and spread more bacteria to other surfaces. Now, with our DFX series installed in that lecture hall, you have a solution that continues to interrupt the replication and spread of bacteria as they are introduced in between regular cleaning cycles. So, if it's on, it will continue to disinfect before, during and after classes.

S4L: And then for classrooms that are equipped with this kind of UVA technology—I guess, when you're a teacher and you're teaching in a classroom, the class ends, you leave, you flick the light off on your way out the door. Is that something that should be left on, or can teachers feel free to just flick the light off and go about their day?

Bruce: Well, see, and that's the advantage of our system, right? Because it actually has two circuits: one specifically for the ambient light, the white light portion; and one for the UV portion. So, they have the ability to turn off the ambient light and actually leave the UV operating so it can continue to be effective, even though the space is no longer being used.

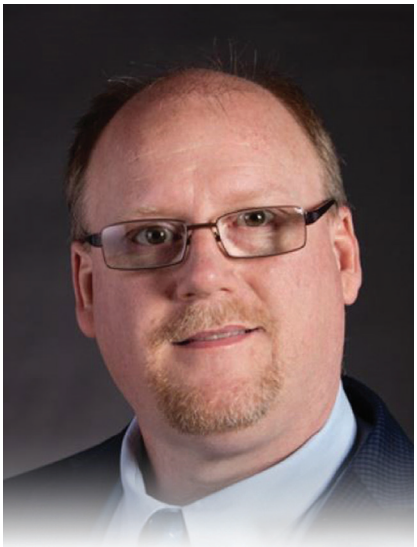
S4L: Does disinfection through lighting reduce the need for standard cleaning procedures?

Tim: No. We consider this as a way to assist in the cleaning process. Even in the most stringent applications, thoroughness is a problem because people aren't very good at being perfect. They miss things. So, this is a simpler solution that works in the background. So, like Bruce said, it's continuing to clean in between cycles, in between cleaning cycles, and also because it doesn't require human intervention, it could be there even when the cleaning crew is not, or doesn't show up, or doesn't wipe every surface.

"Well, the human eye can see light between 400 and 750 nanometers. And I know we're talking science here. Below 400 nanometers is considered ultraviolet, or UV, light, which is broken into three sections. The first section is called UVA and goes from about 400 to about 320 nanometers. UVA can be used to kill bacteria. It does this by causing a photochemical reaction within the bacteria itself. Basically, the pathogen absorbs the energy from the UVA light, which causes defects and prevents them from replicating, and eventually leads to the inactivation or death of that bacteria cell."
— Tim Stevens

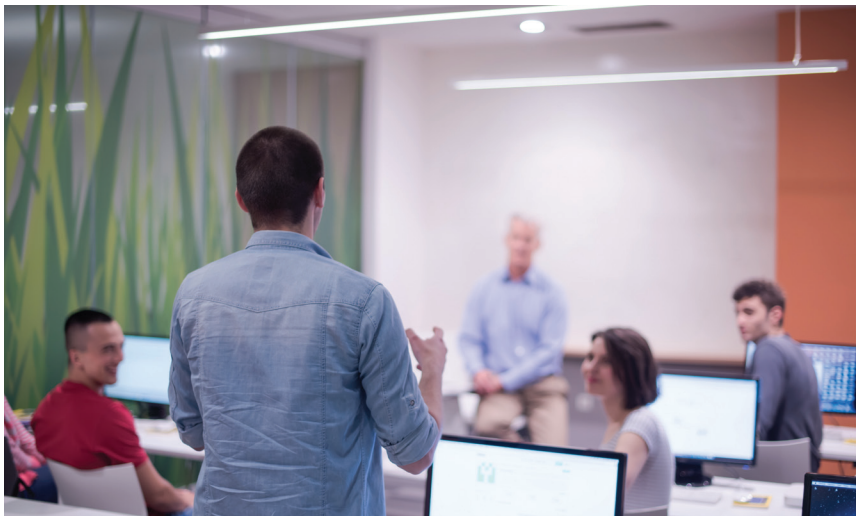
S4L: We're talking about Leviton's disinfection technology using the 365DisInFx technology. And my first question about that is, what does the "365" stand for in 365DisInFx technology?

Bruce: Well, 365 actually has two meanings. The first is a very literal interpretation, as it references the technology that it's based on. It actually uses a 365-nanometer wavelength. And if you remember before, Tim mentioned the different wavelengths, and that sits right in the middle of the UVA band. And this wavelength provides an excellent source of disinfection that's more effective than visible light, but when it's used properly, it provides the peace of mind that it can be used in occupied spaces, unlike UVC sources. That leads to the second meaning of 365, which means 365 days of the year. Because our DFX series doesn't need to be used exclusively when the spaces our empty. It can continue to disinfect 24 hours a day, 7 days a week, 365 days a year.



S4L: What pathogens does the 365DisInFx UVA technology kill?

Tim: The UVA light produced by Leviton's LRTH-DFX series, which is one of the current models that we have, kills bacteria such as MRSA, which is an antibiotic-resistant strain of a common bacteria called Staphylococcus aureus, or sometimes just called staph. It's also effective against salmonella, and another one you may have heard of is Escherichia coli, or E. coli, as well as many others I have a problem pronouncing. If you'd like to see the list of tested bacteria, there's a list available on our website. I know



"That's a huge advantage in cost savings, because these solutions are actually embedded in the ambient light fixtures rather than in a machine dedicated to just cleaning. So, you already have the fixtures there, lighting the space. Why not kill two birds with one stone?"
— Bruce Ramsay

everyone's interested in whether the technology can kill the virus responsible for COVID-19. Unfortunately, we can't make any claims regarding its effectiveness against this virus at this time.

S4L: Is the 365DisInFx technology safe?

Tim: Well, we have heard that UV causes skin and eye damage. UV light can be safely used for disinfection, yes. And the key is that not all UV is the same. At certain power levels and wavelengths, UV light can be both effective and suitable for human exposure. In the case of 365-nanometer UVA technology, properly installed fixtures can be used in a continuous 24-hour exposure to people under the safety standard IEC 62471. The name of that is the Photobiological Safety of Lamp and Lamp Systems. This is one of the standards used when applying for safety listings from places like Underwriters Laboratories, for lighting products. And it's designed for spaces like classrooms.

S4L: Can we talk about some myths about UV light technology? Is there anything you'd like to clear up?

Bruce: I think one of the biggest myths has a lot to do with what Tim was just speaking about in regards to the idea that if you ask someone, they're gonna say that all UV light is dangerous. And that's not exactly true. Because UV light, as we mentioned before, it comes in a wide spectrum. And the intensity of that light at any given point in the spectrum is what really matters. And at some wavelengths, and at some intensities, UV light can be safely used to kill bacteria within occupied spaces, even when the spaces are occupied 24 hours a day. So, the Leviton products that use 365-nanometer UVA technology, they are completely suitable for continuous, 24-hour human exposure.

S4L: Circling back around to education and some of the more practical, logistical uses, where and how could you see using the 365DisInFx technology in a school environment?

Bruce: Well, it can definitely be used in educational spaces like locker rooms, lunchrooms, bathrooms and even classrooms. Our first fixtures with the technology are intended for general illumination, and they fit really well into these spaces. The fixture's ability to always be on means it's always on task, reducing bacteria. They can even be left on all night because of their low wattage. And they have less impact on the energy usage while still greatly reducing harmful bacteria. So, when you think about those spaces—like, say, for instance, the locker room and the hallways—there's so much traffic. There's so much interaction between surfaces, doorknobs, and you're not going to have the janitor following behind every child. So, those are great spaces, those high-traffic areas, to have our products continuously working to protect and keep the space clean while it's still being used.

S4L: Based off of personal curiosity, are there any kind of size requirements? Is there any kind of space that might be too big for a single unit—comparing something like a janitor's closet versus a large lecture hall?

Bruce: Well, I mean, that's the good thing about the offering that we have right now, in the fact that the offering will grow. In the recessed T-bar offering, we have our LRTH DFX, which is a troffer that will fit in a two-by-two space or a two-by-four space, but in some instances, you may not have a T-bar ceiling, and you may have something like a janitor's closet—where maybe it's hard ceiling, and you're looking for something like our linear product, the LCOM DFX, which would be perfect for spaces that

don't necessarily have that traditional recessed T-bar. So, we've got a couple different options that would work well in that space, regardless of whether you have a typical ceiling or a hard ceiling.

S4L: And then, what are some of the benefits for end users in educational facilities, meaning faculty, staff, students and parents?

Bruce: That's a great question. I tend to get caught up in a bit of the technical aspect and how great the technology is, but when it comes to the human interest, it really provides peace of mind. Students are in that space, so they're not really thinking about how clean it is, but their parents are. And they know that their students are being cared for, and they're in a space that's going to be disinfected on a regular basis, and then (of course) you've got the teachers that are there as well, and that's where they spend most of their workday. So, they know that the hallways, their classrooms, are continuously being supported by this technology. So, in general, I think peace of mind is probably the greatest value that our solutions can provide.

S4L: What are some of the challenges that specifiers should be aware of when it comes to UV lighting?

Tim: There are a few things related to installation that specifiers need to be aware of. For instance, these fixtures are intended to provide a certain recommended minimum amount of UVA light. To understand how best to use the fixture, we have an application guide that shows just how to use the fixtures. Just like visible light, there is also a consideration of light distribution and uniformity. Your lighting professional already knows how to do these luminous calculations for white light. So, they're well on their way to doing these kinds of calculations, as well. Your common calculation software to determine UVA light levels is used to do the same kinds of calculations as white light. It's really quite simple.

S4L: What Leviton lighting options exist with UVA lighting technology?

Bruce: So, you know, we touched on it a bit. The initial launch that we had was with the Viscor brand Visioneering. We launched three products: a recessed troffer, the LRTH DFX; a retrofit kit that fits with the same design as the LRTH DFX; and our linear, which is the LCOM DFX. Now, these offer general illumination, as Tim mentioned before. With the retrofit, it's great for converting existing fixtures with this technology. So, the idea is that we have solutions for new construction, retrofit, and of course, we're going to continue to grow that offering into our Certolux brand and other Leviton brands. And Tim, I don't know if you want to talk a bit about what you have on the Certolux roadmap for the DFX series?

Tim: Well, we do have some products coming out in the medical world. These are fixtures that are intended to address the healthcare concerns with hospital-acquired infections, so that's to come this coming winter.

S4L: It looks like that's about everything that we had had prepared for the day. Did either of you have any last words or last thoughts that you wanted to get in?

Bruce: Leviton lighting already provides a wide family of lighting solutions, and now with our 365 DisInFx offering, we have the ability to marry the best of both worlds with illumination and disinfection for schools and educational spaces. So, although our lineup is currently these three initial fixtures, there's gonna be a wide range of offerings available through all of our Leviton brands. So, if you're looking for more information and want to get some updates, feel free to visit us at Leviton.com, and there'll be available information on our current offering—and, of course, future information on what's to come.

S4L: And that is about all the time we have today on *Schools in Focus*. I'd like to thank our speakers one more time—Bruce Ramsay, the Brand Manager for Visioneering, and Tim Stevens, the Director of Product Management for Certolux. I'd like thank our sponsor, Viscor, a Leviton company. Thank you to all of our listeners for tuning in and spending some time with us, and we will see you next time.