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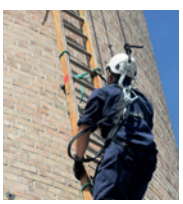

Lightning protection
When lightning strikes

Wellbeing, workplace health and productivity

Tamlite Lighting explains how to best incorporate the theories and practices of human-centric lighting when designing or commissioning a new lighting system in workplaces. Dan Griffiths, product manager at Tamlite explains

It may not have come to everyone's attention just yet, but an astonishing link between Human-Centric Lighting (HCL), wellbeing and the Nobel Prize has recently been in the limelight.

The news is remarkable; the 2017 Nobel Prize in Physiology or Medicine was jointly awarded to Jeffrey C. Hall, Michael Rosbash and Michael W. Young for their work, which dates back to the 1980s and, which led the way to further discoveries of the molecular mechanisms controlling our circadian rhythm.

This very rhythm is at the core of how Human-Centric Lighting, in the office space and beyond, is designed to work harmoniously with humans.

So, what does the Nobel Prize have to tell us about lighting workplaces correctly, in a more holistic way?

THE PATTERN OF LIFE

Life on earth is adapted to the rotation of our planet. For many years we have known that living organisms, including humans, have an internal, biological clock that helps them anticipate and adapt to the regular lighting rhythm of the day.

That rhythm has low light levels and low colour temperatures in the early morning, high light levels and colour temperatures at mid-day, returning to low levels during the evening, and extremely low levels and a medium colour temperature under moonlight. It's essential that modern lighting seeks to replicate and protect this natural state. Better productivity, better ▶

work patterns and happier employees are the obvious benefits.

Our inner clock adapts our physiology to the different phases of the day. The clock regulates critical functions such as behaviour, hormone levels, sleep, body temperature and metabolism. Our wellbeing is affected when there is a temporary mismatch between our external environment and this internal biological clock, for example when we travel across several time zones and experience jet lag.

Shockingly, such mismatches regularly occur when lighting in the workplace is poorly specified too. This is big news; there are indications that chronic misalignment between our lifestyle and the rhythm dictated by our inner timekeeper is associated with increased risk for various diseases, such as heart disease, obesity and cancer.

So poor lighting might not just be affecting productivity, it could be doing something much more sinister to our employees.

LIGHTING AND PROTECTING OUR NATURAL RHYTHMS

Since the seminal discoveries by the three scientists, circadian biology has developed into a vast and highly dynamic research field, with implications for our health and wellbeing; the biological clock is involved in many aspects of our complex physiology.

The simplest steps to take when applying this in a workplace scenario include offering a more supportive lighting environment with daylighting, far greater window space and considered colour tone in an office.

Equally, it's vital to look at the positioning of desks, challenging issues with glare, and to consider, especially in wintertime, whether the amounts of blue within computer screens, tablets and IT equipment are supporting your staff's natural rhythms as best they can.

As suggested by the scientists however, none of this need be a major issue. What we are seeking to do with circadian and human-centric lighting is to return our lighting to a more natural state; something which is obvious and innate to every one of us.

WHAT TO DO NOW

"Light is the most important environmental input, after food and water, in controlling bodily functions" Wurtman 1975. This includes emotions, mood and productivity. It will always be clear if lighting isn't as it should be. Glaring, harshly used fluorescent tubes will be obvious and can be easily replaced with LEDs, set to smart usage systems which will save you both energy and save staff the hassles of switching off systems.

Equally, giving staff a choice on where they sit, and offering them control over their lighting levels at different times of day, as they would have in their own homes will have a positive effect on their workspace and motivation levels.

Tamlite is a passionate advocate of the advantages Human-Centric Lighting brings, and all products are designed to maximise its benefits in the workplace. However, often the most important step is recognising there may be an issue, and then moving proactively to change the situation rather than burying the issues under the carpet.

Day to day business is challenging; many drivers compete for our attention. We can therefore offer advice on lighting financing, actual systems, or overview your estate and premises to get a sense of what's best and where the quick wins on lighting can be.

Tamlite believes that when something as vital as the Nobel Prize shines a light on Human-Centric Lighting, it's crucial we all sit up and take notice.

NOT ALL LEDS ARE THE SAME

While ensuring classrooms enjoy natural light is preferable, not all buildings are designed to use it to optimum effect; fortunately modern LED lighting can simulate daylight.

However while LED lighting is highly efficient, when considering refurbishment incorporating new LEDs, designers need to ensure that they specify luminaires whose colour and intensity of light can be adjusted over the course of the day to suit the students' changing needs. This means that in the morning, pupils can be exposed to stimulating blue-rich lighting, designed to replicate daylight, progressing to warmer lighting when peace and quiet is needed.

IMPROVED STAFF WELLBEING

Staff, whether teachers or support staff, also benefit from intelligent lighting systems. Their wellbeing is improved when their workspace is optimised, leading to less absenteeism and improved performance. The installation of new, intuitive controllers gives them better control over their immediate environment, while supporting them in their work. And exchanging a problem-prone older system for a modern, more reliable technology brings peace of mind, while reducing time spent on maintenance.

ENERGY & COST SAVINGS

Switching to LEDs also eases the financial burden. In a school or university setting, lighting can equate to 25% of all energy consumption. LEDs use around half the energy of a fluorescent lamp, and as much as 90% less than an incandescent light, and they last up to 20 times longer than incandescent bulbs. In addition modern controls systems, and sensors which react to occupancy levels by switching off lighting in unused areas, boost cost savings. ER

LIGHTING IN EDUCATION

Human-Centric Lighting is not only crucial in office or commercial environments. Ensuring that students enjoy the optimal conditions for learning at all ages is fundamental to a holistic approach to building and maintaining school premises.

Designing appropriate spaces, incorporating WELL Building standards and approaches to lighting, and being sensitive to students' physical, mental and emotional health are key. As is removing excess clutter that might disrupt overall classroom environments or over-stimulate sensitive learners.

"Lighting plays an important role in evoking emotions. Lighting can be used to make an architectural space more aesthetically pleasing or it can create an atmosphere in that space; both affect people's emotions. In addition, the user's well-being can be directly influenced by light. Brightness, colour, direction, contrast and time are parameters used to create lighting conditions that address this.

"Because lighting profoundly affects numerous levels of human functioning such as vision, circadian rhythms, mood and cognition, its implicit effects on learning and classroom achievement cannot be dismissed. Several studies have addressed how the quality and colour of lighting can either impair or enhance students' visual skills and, thus, academic performance. Visual impairments alone can induce behavioural problems in students, and the level of concentration and motivation in the classroom."

Michael Mott et al (Illuminating the effects of dynamic lighting on student learning).

So what are the top three aspects to consider for school lighting?