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Flicker-Free LED Lighting and Healthier Workplaces: An Analysis

In the quest to ensure a healthier, safer and more productive work environment, lighting innovations can be a central factor. The advent of flicker-free LED lighting offers a promising alternative to fluorescent, incandescent and early-generation LED lighting, even as it significantly reduces maintenance costs.

By John Davenport | Nov 06, 2019

In the quest to ensure a healthier, safer and more productive work environment, lighting innovations can be a central factor. The advent of flicker-free LED lighting offers a promising alternative to fluorescent, incandescent and early-generation LED lighting, even as it significantly reduces maintenance costs. For a wide range of stakeholders within the occupational health and safety space, it is worth assessing the general characteristics of flicker-free LED lighting and the benefits of its implementation.

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Flicker is unsteadiness in light. We can consciously track unsteadiness in light or flicker up to about 80 times per second. If a light source is flickering faster than 80 times per second¹—for example, at the power line power frequency of 120 times per second—our bodies still respond to the light’s fluctuations even though we may not “see” them. Like the more visible forms of flicker, this “invisible” form flicker can have a negative impact on health, wellness and productivity.



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The most common cause of flicker in a light is a result of the AC power line modulating the power to the light source. When the power to the light source changes, the light output changes—unless the circuit in between prevents it. While electronic ballast-driven fluorescents greatly reduced this light fluctuation—or flicker—versus their magnetic ballast-driven predecessors, most early-generation LED products reintroduced high flicker rates into indoor environments.

Everyone is sensitive to flicker to some degree. It may contribute to headaches, eyestrain and fatigue; research also suggests it can exacerbate migraines. Certain individuals, such as those on the autism spectrum, experience visual hypersensitivity, where lighting triggers can result in heightened symptoms. Flicker can also induce seizures in people with photosensitive epilepsy. While there are no standards that require lighting manufacturers to remove flicker, the Institute of Electrical and Electronics Engineers (IEEE 1789) indicates that having less than five percent flicker (at power line frequency) presents a low risk to these populations.

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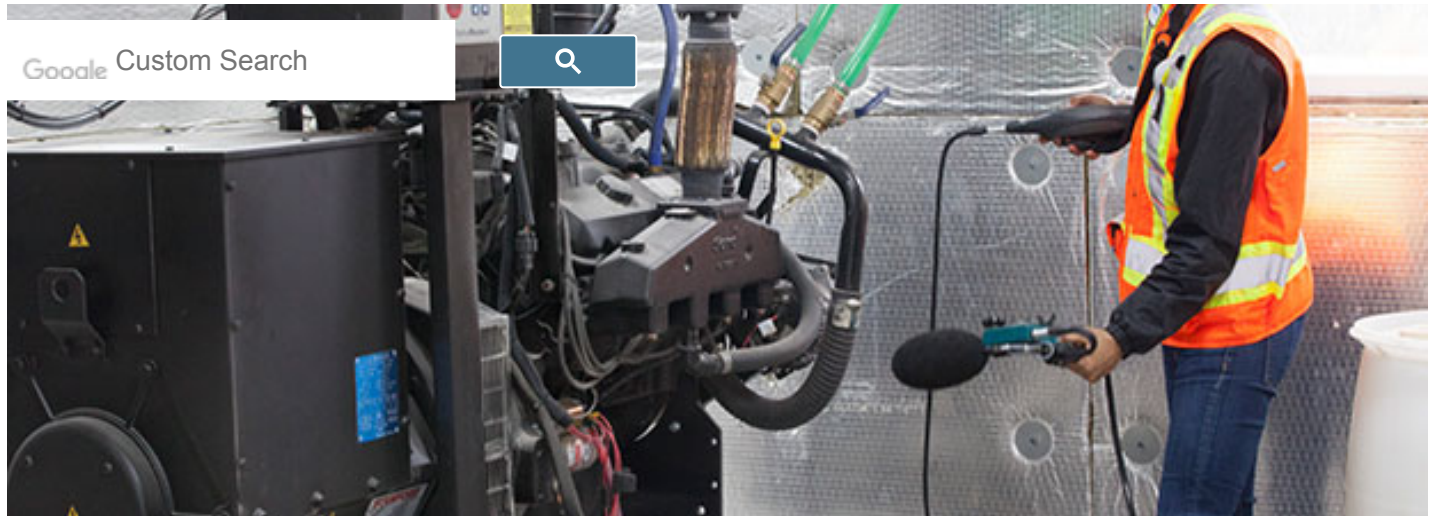


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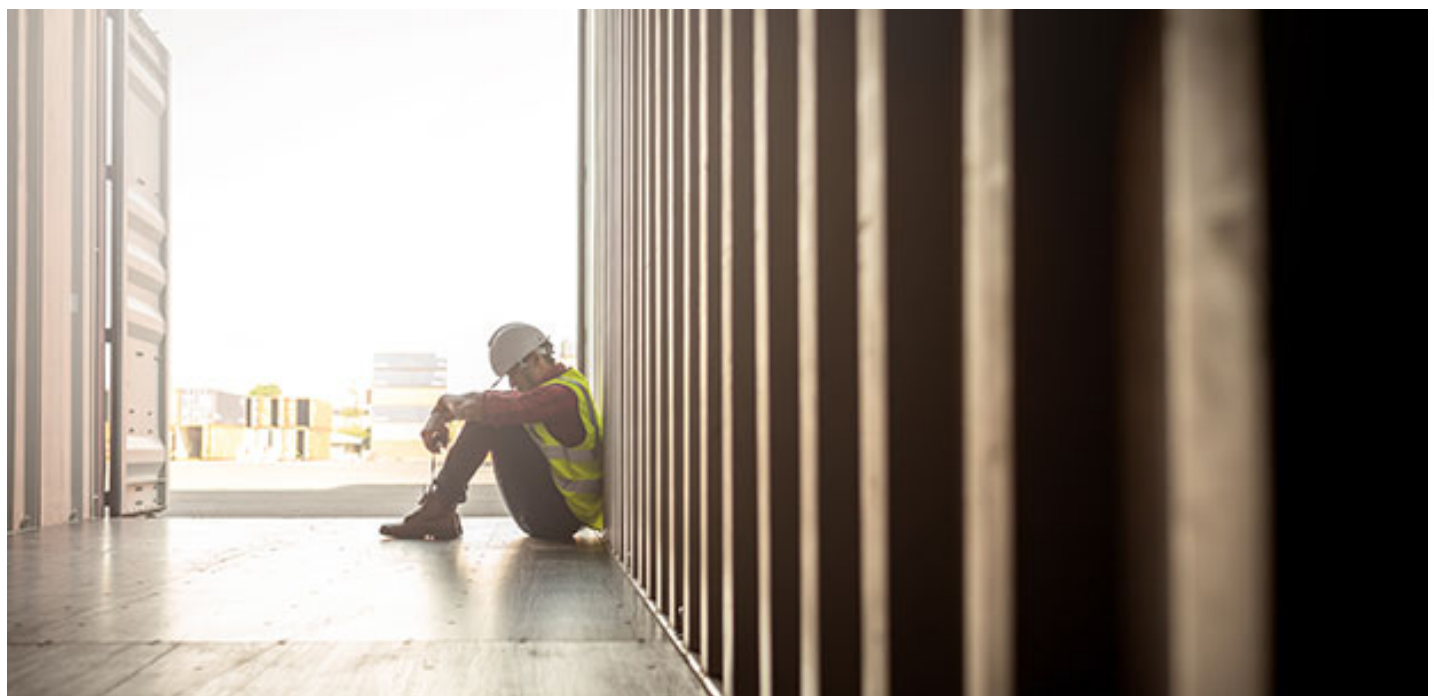


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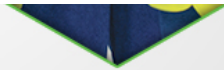
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