

January 15, 2022

BY EMAIL

Leah Graziano, Regional Director, Eastern Section
Agency for Toxic Substances and Disease Registry
Centers for Disease Control and Prevention
lge2@cdc.gov

Re: The LED Fraud

Dear Leah Graziano,

The purpose of this letter is to formally notify you that the use of LEDs, both static and flashing, by reason of their emission of spatially non-uniform electromagnetic radiation, are a toxic substance and to request that the Agency for Toxic Substances and Disease Registry perform a public health assessment of this toxic substance.

MarieAnn Cherry is a resident of New York who has epilepsy, a formally recognized disability, and who has been sickened by LED light beams many times. Her exposures to LED light beams, even for a fraction of a second, has led to hundreds of seizures resulting in broken bones, lost teeth, and psychological trauma. MarieAnn has researched the issue and has written up a synopsis of how the safety of LEDs has been ignored by the authorities.¹ MarieAnn's document also contains links to 40 studies on the toxic effects of LEDs.

While we are requesting an assessment of the toxicity of LED light beams, we wish to alert the ATSDR that it is unethical to directly study whether a technology triggers a life-threatening seizure in humans by exposing the person to the possible trigger. It is also unethical to involuntarily subject humans to medical experiments.² However, a study does not necessarily have to be carried out in a laboratory. A study of verifiable reports of incidents related to LED light beam exposure is a valid study. MarieAnn has compiled a list of verifiable quotes from persons who have been injured by LED exposure.

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¹ http://www.softlights.org/wp-content/uploads/2022/01/One-Third-of-us-at-Risk_-The-Medical-science-of-LEDs.pdf

²

https://media.tghn.org/medialibrary/2011/04/BMJ_No_7070_Volume_313_The_Nuremberg_Code.pdf

³ <http://www.softlights.org/wp-content/uploads/2022/01/Quotes-from-individuals-harmed-by-LED-exposure.pdf>

MarieAnn’s efforts highlight the toxic effects of LED light beams on people with epilepsy, but the toxicity of spatially non-uniform electromagnetic visible radiation impacts all members of the public because of the way it interferes with the proper functioning of human nerves, and the damage to the eye caused by chemical and thermal damage.

To assist you with the technical details of why LED light beams are so toxic, we provide additional technical information. LEDs emit electromagnetic radiation from a flat surface which creates a mix of energies that are not uniform, and the result is a low quality, toxic, hazardous, and discriminatory type of visible electromagnetic radiation.

Light Emitting Diodes produce light beams, rather than spatially uniform light. The result of the emission from the flat surface of an LED chip is an exceedingly intense beam from the middle of the chip that exceeds human tolerance levels and is toxic, hazardous, and discriminatory. This spatially non-uniform electromagnetic radiation from LEDs is unregulated and not approved by the government.

The left side of Figure 1 shows a spherical emitter that sends light in all directions in space. Because of the curvature of the emitter, the light rays do not overlap, and the radiation is spatially, spectrally, and temporally uniform. Every single point on the sphere is the same as any other point. On the other hand, the right side of Figure 1 shows a flat surface emitter such as an LED, which has a middle and edges. This flat surface creates a situation where the middle of the chip has different energy than the edges of the chip. LEDs send light only in the forward direction and the light rays are confined to an ‘escape angle’ which is determined by the physical characteristics of the chip. Thus, there are overlapping rays, with the most overlap being in the center of the chip, and the least overlap being on the edges. The result is that every point in space has different spatial, spectral, and temporal properties.

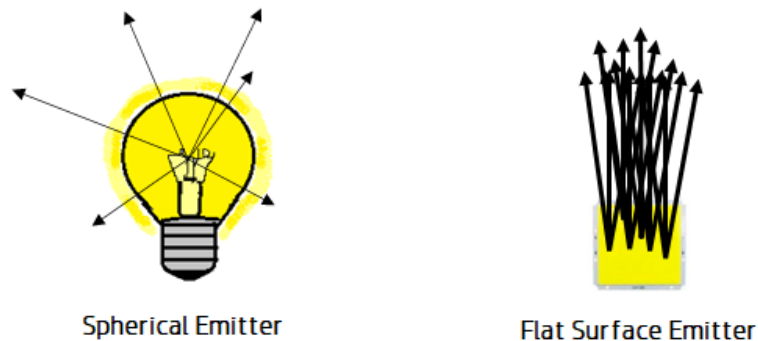


Figure 1 - Spherical vs. Flat Surface Emitter

Figure 2 shows the uniform spatial energy from candles, incandescent and High-Pressure Sodium versus the non-uniform spatial energy from an LED. The intense peak of energy will cause eye damage and will overload the nerve signals to the brain because the information is not uniform. These negative outcomes are the effects of the toxicity of LEDs.

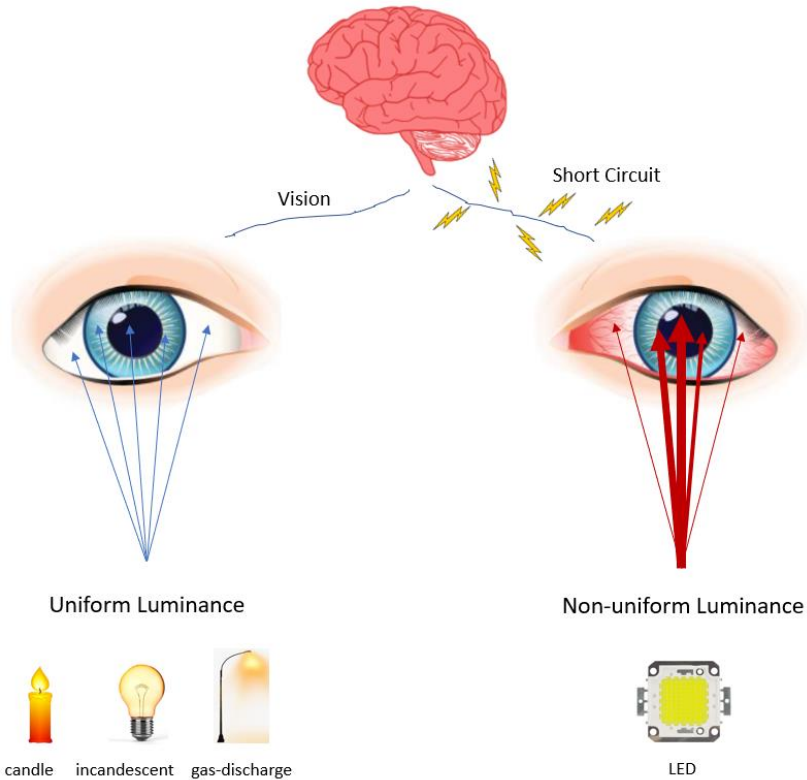


Figure 2 - Spatially Uniform v. Non-Uniform Radiation

Figure 3 is a diagram showing the categorization of radiation and shows that *light* and *illumination* are spatially isotropic radiation in the human visible portion of the electromagnetic spectrum. Radiation emitted by LEDs do meet the regulatory meaning of or comply with standards for the use of light as illumination.

Regulatory Meaning of Light and Illumination

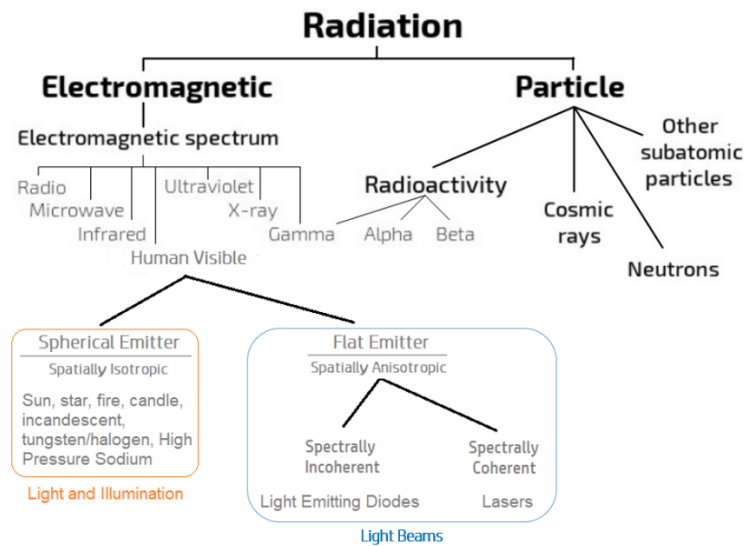


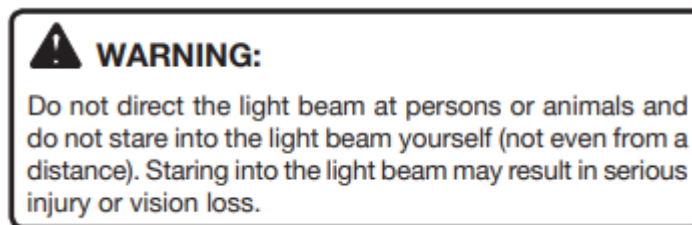
Figure 3 - Radiation Types

Figure 4 shows a uniform illumination device that is compatible with the human nervous system left side of the diagram and the non-uniform radiation emission of a flat surface LED on the right.



Figure 4 - Streetlight Comparison

As an example of how dangerous LED radiation is, the operator’s manual for the Ryobi P705 Flashlight includes the following: *“WARNING: Do not direct the light beam at persons or animals and do not stare into the beam yourself (not even from a distance) Staring into the light beam may result in serious injury or vision loss.”* The warning also refers to children, who along with infants are an identified high-risk population vulnerable to LED-exposure harm. Babies often lack an adult’s automatic, self-protective aversion response to bright or intense light, and will stare directly at the source. The parenthetical *“(not even from a distance)”* indicates a high level of danger.

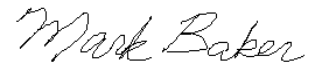


The result of exposure to LED electromagnetic radiation is immediate sickness in the form of headaches, nausea, eye pain, loss of balance, migraines, panic response, altered vision, epileptic seizures, disorientation, and other neurological disturbances. Each of these symptoms is being verifiably reported by an increasing number of individuals and constitute medical evidence of LED-induced harm. LED visible radiation exposure is causing catastrophic physical harm, subjecting individuals to illness and injury, and plunging formerly healthy, independent people into crisis levels of stress, hopelessness, psychological trauma, and persistent thoughts of suicide.

As per the ATSDR's website, the ATSDR has the Congressional authority to assess toxic sites.⁴ We also wish to assure the ATSDR that, even though ATSDR typically assesses chemical substances such as found in air and water, LED light beams are also a substance whose toxicity effects can be assessed. In the case of LEDs, there are many toxic sites throughout New York. To simplify testing and to reduce variables in the study, we suggest selecting a site in a small township that has switched to LED streetlights. Please be aware that the street lighting industry has resisted oversight and will argue that LED streetlights are safe and that their current measurement techniques provide reliable results. These statements are not true, and the toxicity of LED light beams, because of their non-uniform spatial shape, need to be evaluated using measurement devices specifically designed for flat-surface emitters. The LED display industry has these measurement devices, but the LED streetlighting industry does not.

In conclusion, the Soft Lights Foundation requests a Public Health Assessment of LED light beams from LED streetlights, paying particular attention to protected-class citizens such as babies, the elderly and those with epilepsy, autism, migraines, and PTSD.

Sincerely,



Mark Baker
President
Soft Lights Foundation
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⁴ <https://wwwn.cdc.gov/TSP/PHA/PHAForeward.aspx>