

Samsung HCL Webinar

**Lighting, One Step Further  
for Mankind**

Part 2.

**New Possibilities in  
Human Centric Lighting,  
Samsung DAY & NITE**

**Q&A**



# Panelists



**Jung-mo Kang**

Head of Research, KTC

*"We've been seeing human centered lighting growing more prominent as a keyword in the lighting market. Although applications for HCL will continue to evolve over time, in the near term, I think there are clear use cases for schools, offices, and hospitals."*



**Yong-duk Kim**

CEO, Luple

*"Our goal is to solve the problems arising from technological advances by paradoxically introducing superior technologies to improve our quality of life. Olly is our first product that reflects this philosophy."*



**Young-sam Park**

Samsung LED

*"The color and effect of the light that we need often clash and we've become accustomed to accepting this... 302N has the advantage of providing both the color and effect you want."*

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# 1. Technology of Human-centric Lighting



What technology was the focus of early human-centric lighting?

Early human-centric lighting products did not actually take non-visual factors into consideration, but were products that synced with external natural light cycles or adjusted the amount of light and color temperature for specific situations. Some global associations also provides guide for applying lighting that follows the solar cycle in places like offices and schools.



# 1. Technology of Human-centric Lighting



There are several certifications and standards being prepared around HCL technology. Are there any standards that must be followed by specific markets or by specific countries?

Who is the leading certification organization in the HCL field?

Because human-centric lighting is a type of lighting, mandatory certifications for distribution and sales are required. However, among these mandatory safety or performance certifications, human-centric indicators are not subject to testing and evaluation. Recently, in addition to these lighting certifications, global organizations like VDE and UL have started testing and certification services.



# 1. Technology of Human-centric Lighting



There are several certifications and standards being prepared around HCL technology. Are there any standards that must be followed by specific markets or by specific countries?

Who is the leading certification organization in the HCL field?

First, VDE started certification for HCL, and A LED manufacturer was recently certified as No. 1. In UL's case, I understand that they've come out with a HCL guide and are planning to start testing services as well. At a national level, countries in Europe and North America are developing regulations for human-centric lighting. As such, certifications and standards in this field are rapidly changing, so continuous monitoring is required for overseas exports.



## 2. Samsung Human-centric Lighting



I am curious about how Samsung's human-centric lighting is different from other lighting.

In the past, human-centric lighting products mainly focused on creating light that mimics nature, like reproducing colors closer to natural light or simulating the changes in color according to the cycle of the sun. In other words, it was a way for modern people to adapt their living environment more closely with nature. On the other hand, Samsung's human-centric products are different from existing products in that they produce light that is scientifically optimized to influence and support the various living patterns and environments of modern people.



## 2. Samsung Human-centric Lighting



It will not be easy for human-centric technology to succeed unless it is efficient and economically feasible. How efficient is Samsung's product?

The M/P ratio, which shows how much melatonin levels are impacted, is important in determining the efficiency of human-centric lighting. The results of our clinical test showed that the M/P ratio of LM302N DAY was 18% higher than that of conventional LED lighting, and that the M/P ratio of LM302N NITE was 5% lower. With a similar level of energy efficiency as typical LED products, these products save energy while also helping to boost or suppress melatonin secretion.





## 2. Samsung Human-centric Lighting



How long do you need to be exposed to HCL products to see its effects?

Although it varies based on the individual, light conditions, and other variables, according to several clinical trials, the effects appear on average within 1 hour. Subjects experienced definite effects when exposed for about two hours. For Samsung products, if you use the lighting with LM302N DAY products any time before going to sleep, we recommend you relax under the lighting with LM302N NITE for about an hour to prepare for bed.



## 2. Samsung Human-centric Lighting



I'm interested in Samsung Electronics' LM302N lineup.

We have a diverse CCT lineup of DAY and NITE products for use in a wide range of environments.

Please refer to our website for detailed specifications,

[www.samsung.com/led/lighting/applications/human-centric-lighting/](http://www.samsung.com/led/lighting/applications/human-centric-lighting/)



## 2. Samsung Human-centric Lighting



Is Samsung products' spectral distribution distinctly different from other companies?

Recently developed human-centric LED products are mainly aimed at replicating wavelengths from sunlight. Samsung HCL products, on the other hand, enhance wavelengths that influence human circadian rhythm, while also maintaining the wavelengths that similar to sunlight. In Olly's case, its spectral distribution delivers its concept of boosting energy and relaxation much better than other LEDs. Olly was also able to be produced as small and light as it is because of Samsung LED's spectral distribution technology.

The basic concept of the LM302N was to create a product that can be used in conventional lighting. LM302N's spectral distribution, efficiency and reliability are similar to those of existing products, so it can easily replace existing lighting.



## 2. Samsung Human-centric Lighting



For DAY, it's intuitive that the purpose is to make you feel awake and energized. For NITE, however, it's less clear whether its purpose is to make you fall asleep or make you relaxed, etc. I'd like to know more concretely what the intended effects of NITE are.

Modern people are spending more and more time absorbing the effects of artificial lighting after the sunsets. Conventional artificial lighting blocks necessary melatonin secretion, thereby disrupting sleep quality. LM302N NITE minimizes the wavelength of light that inhibits melatonin secretion to maintain a healthy circadian rhythm even when people stay active late into the evening.



## 2. Samsung Human-centric Lighting



I think it's a huge advantage that HCL can boost focus and help prevent accidents. Can HCL be applied to outdoor or spaces like automobiles for similar purposes?

The most immediate example would be to apply it inside airplanes. Because the lighting can energize or relax our bodies, it can help eliminate jet lag during long distance travel. We can also think about applying it to self-driving cars. If self-driving cars become more common, drivers will become accustomed to doing other things while inside a car. We can expect this lighting will prevent drivers from dozing off, using its energizing effects. Aside from these examples, I think there will be a variety of other ways to utilize it.



### 3. "Olly" with Samsung LM302N

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What does Olly mean?

The name "Olly" was inspired by the idea of an owl and stands for "Optimal Light to Liven up the Yawny moment." It represents a circadian light that helps you stay awake late into the night.



### 3. "Olly" with Samsung LM302N



I'm interested to hear about the customer reaction of Olly.

35% purchased the product because of its stated positive effects and 32% purchased the product for their energizing and sleeping needs. 11% were customers who weren't receiving enough light, and about 80% responded saying they purchased Olly because they acknowledged the overall importance of light. Only 5% of purchasers shared that it was because the product was cute. We're seeing a lot of positive feedback on social media. Our project was aimed at improving quality of life and with the immense support we've been receiving, I can sense there is a lot of interest and hope surrounding HCL.



### 3. "Olly" with Samsung LM302N



How was the reaction towards Olly at CES?

At CES2020, we didn't present Olly, but instead introduced an AI driven, circadian rhythm-care lighting device with a digital caffeine concept. At that time, it received a lot of attention from countries like the US, Japan, and Europe. Many people acknowledged that light no longer just illuminates darkness, but also has a significant effect on our bodies. After confirming consumer interest through its reception, we decided to mass produce Olly products and began production 7 months later. Currently, Olly has been submitted for the CES2021 Innovation Awards, Health & Wellness category.





## 4. Market Trends in Human-centric Lighting



Are there lights that regulate melatonin actually on the market?

There are a variety of products promoted as human-centric lighting currently sold overseas. Although some of the products simply control the amount of light and color temperature, others are marketed and sold with functions focused on melatonin control.



## 4. Market Trends in Human-centric Lighting



How large is the human-centric lighting market?

Light is something we always need until we go to sleep. As such, any place or situation that we are awake for is an application for human-centric lighting. To start, the initial market is switching traditional lighting out for human-centric lighting. Next, there will be a market for human-centric lighting where its particular advantages will be utilized.



## 4. Market Trends in Human-centric Lighting



Where and what applications are human-centric products needed the most in the market?

Up until 1-2 years ago, most companies were heavily marketing smart lighting products. Recently, however, many companies are developing and marketing products around human-centric lighting. Offices, schools, hospitals, etc. Any space that has a designated purpose is a place that you can utilize human-centric lighting. Recently, results from case studies of large retailers and offices using human-centric lighting for their employees have been released. I believe that these results will speed up adoption moving forward.



## 4. Market Trends in Human-centric Lighting



You launched a new type of product that controls the spectrum of light. In the future, which markets do you see these lights growing and getting the most attention?

In the future, I can see human-centric lighting being applied not only in the medical or educational field, but also to living spaces and leisure spaces. I also think that lighting will integrate with IoT and AI technology to enrich people's lifestyles. At Las Vegas' CES in January 2020, Luple announced a new product that uses AI to detect a user's behavior and automatically provide an optimal spectrum. In the end, I believe personalization in technological integration will be indispensable. If we look at smartphones, they include so many built-in sensors that they can track nearly any bio signal. That is how much global interest exists in healthcare. Lighting will no longer be a device that simply aids darkness, but it will become a device that can help us maintain our health too. We will live in a world where lighting supports your circadian rhythm no matter where you are. It's a world we will see very soon, not too far in the future.



## 4. Market Trends in Human-centric Lighting



Price will be an important factor for human-centric lighting to reach general consumers. When you consider price requirements, how many years do you think it will take before it can be widely distributed?

When consumers choose a product, their decision to purchase comes if the value they obtain from the product is higher than the cost of purchasing it. It's true that the current price level is higher than that of general lighting, but demand is increasing because of its various benefits and because consumers are becoming more educated and promoting it. I think that if this leads to mass production, it can secure a competitive price. I foresee that this type of trade-off will come in the next 2-3 years, latest.

