



**SAMSUNG**

# Energizing Lighting Solutions

Make every moment more  
productive and efficient

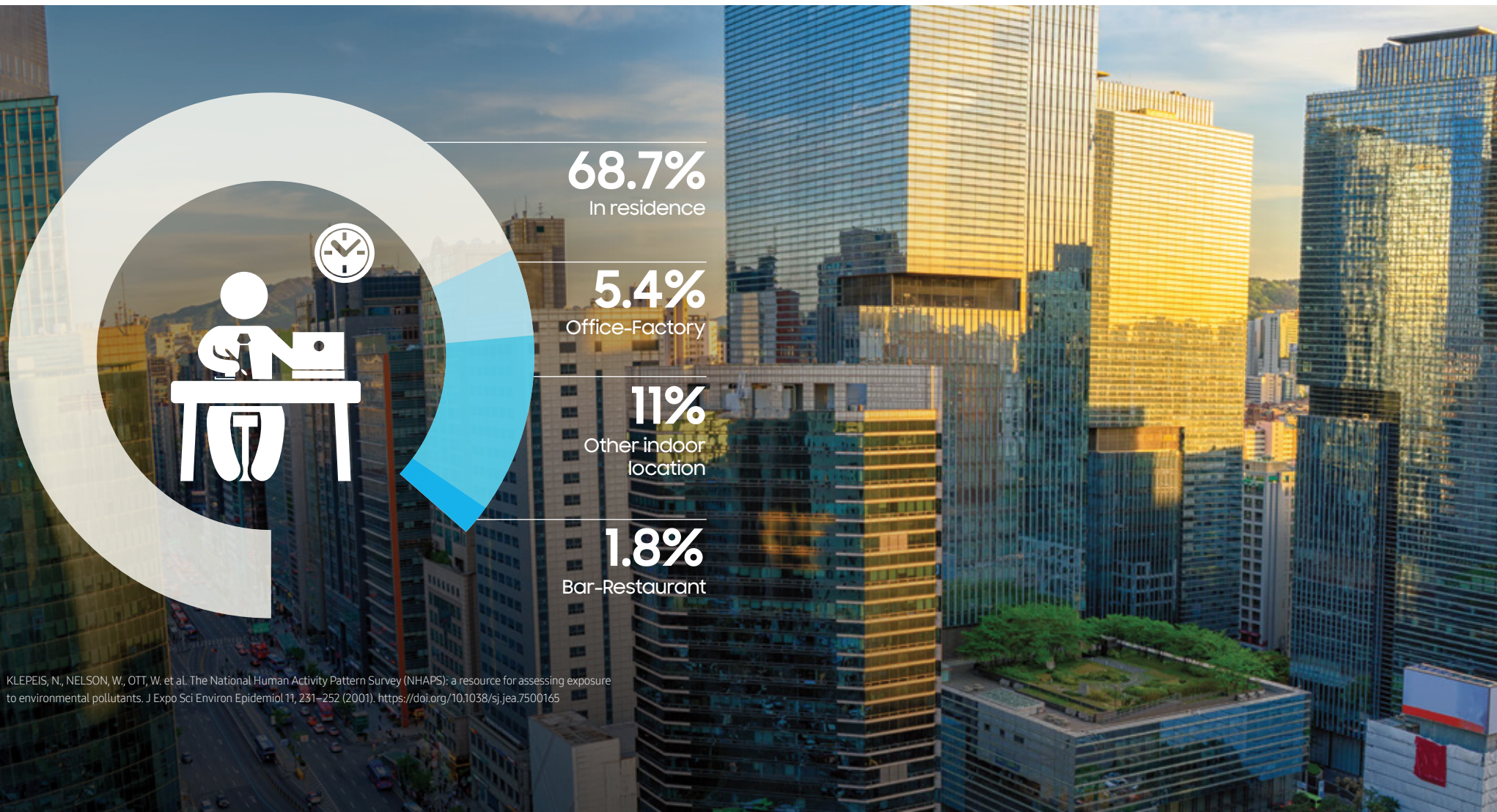
2021 H2



We spend most of our day indoors.

Countless hours under artificial lighting in offices, schools, and even at home, may be the reason we feel tired throughout the day. Natural daylight has the highest intensity of blue wavelengths, which traditional lighting lacks, and triggers photoreceptors that suppress melatonin production in our bodies. This is why we feel more energetic in daylight.

So, what if we had indoor lighting that improved our concentration levels and made us more productive and efficient?  
How would offices, schools, homes, and even gyms, change?



KLEPEIS, N., NELSON, W., OTT, W. et al. The National Human Activity Pattern Survey (NHAPS): a resource for assessing exposure to environmental pollutants. J Expo Sci Environ Epidemiol 11, 231–252 (2001). <https://doi.org/10.1038/sj.jea.7500165>



“Studies have shown that employees suffering from poor health are absent more often, lose more work hours, and are less productive than employees without these conditions. Enhanced lighting design is key to creating the right environment for the people in the space.”

– Well Light Concept Advisory Brent Protzman

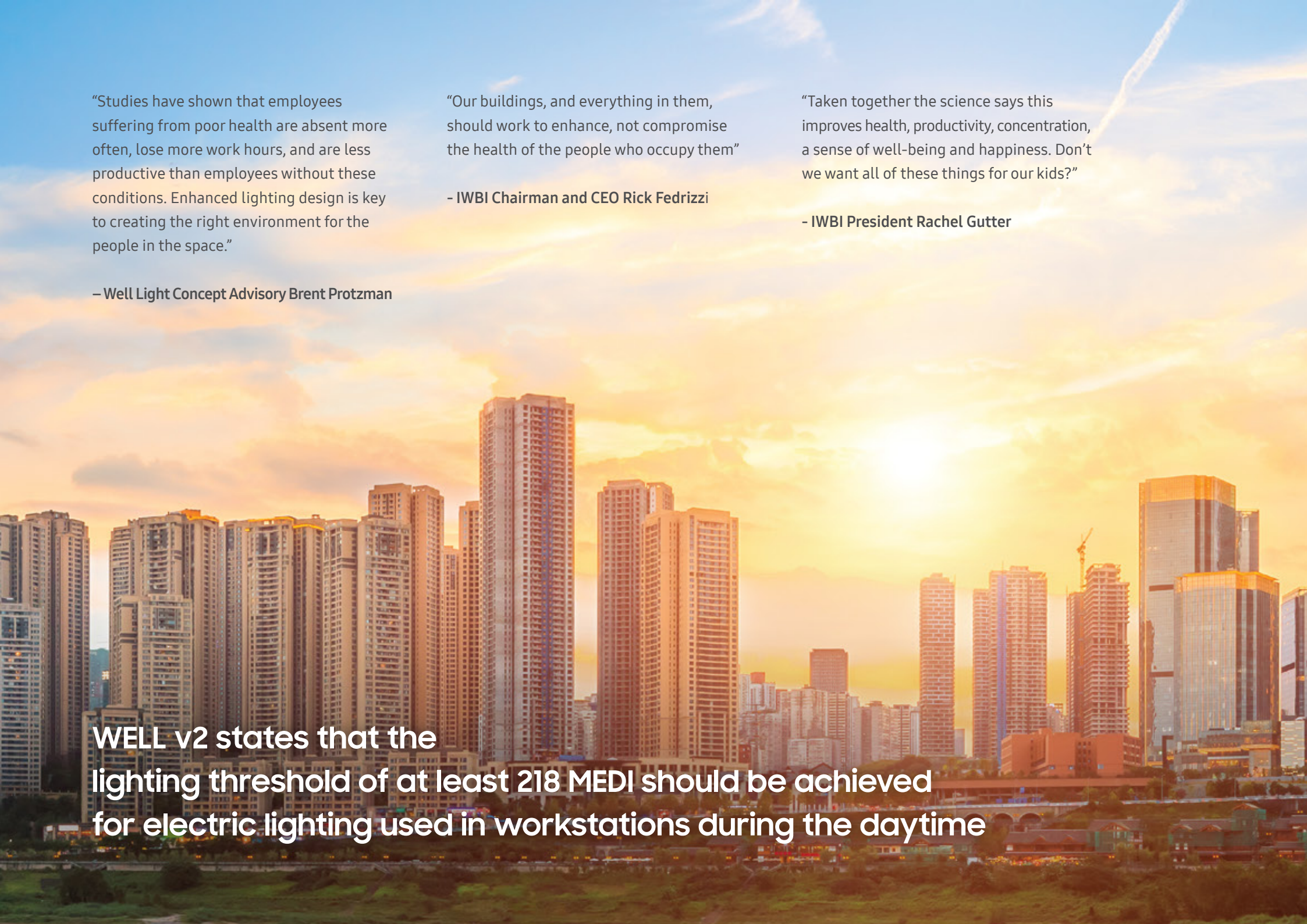
“Our buildings, and everything in them, should work to enhance, not compromise the health of the people who occupy them”

- IWBI Chairman and CEO Rick Fedrizzi

“Taken together the science says this improves health, productivity, concentration, a sense of well-being and happiness. Don’t we want all of these things for our kids?”

- IWBI President Rachel Gutter

**WELL v2 states that the lighting threshold of at least 218 MEDI should be achieved for electric lighting used in workstations during the daytime**



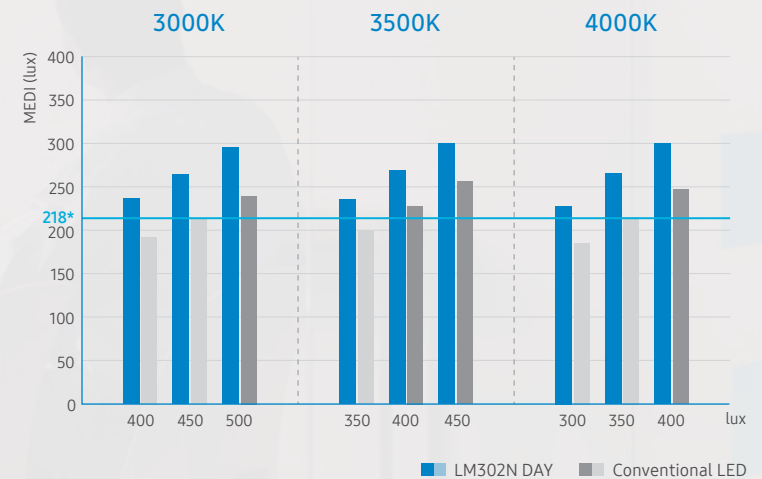




# Meeting Rooms Filled with New Ideas

Meeting rooms are made for sharing ideas and carrying constructive conversations. Having a welcoming and friendly atmosphere can help workers feel freer to collaborate and more open to discussion.

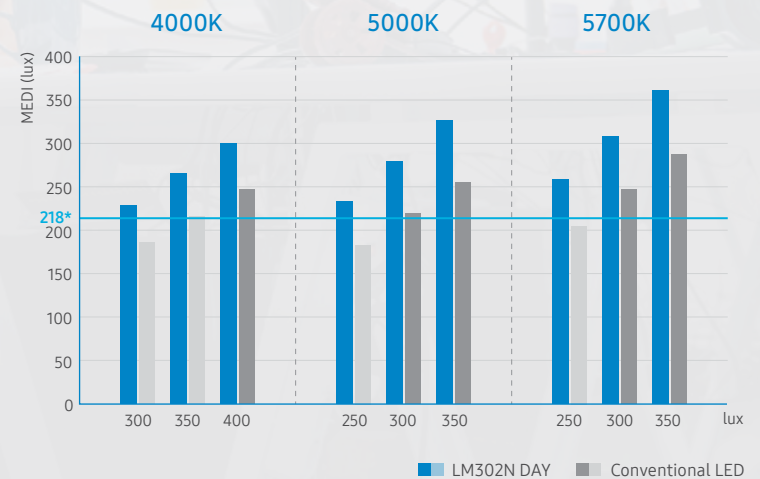
Samsung's Energizing Lighting Solutions provide warm correlated color temperatures between 3000K and 4000K for a pleasant atmosphere. Additionally, its high MEDI promotes focus and helps workers stay attentive, even in warmer white tones.



# Office Spaces for Higher Success

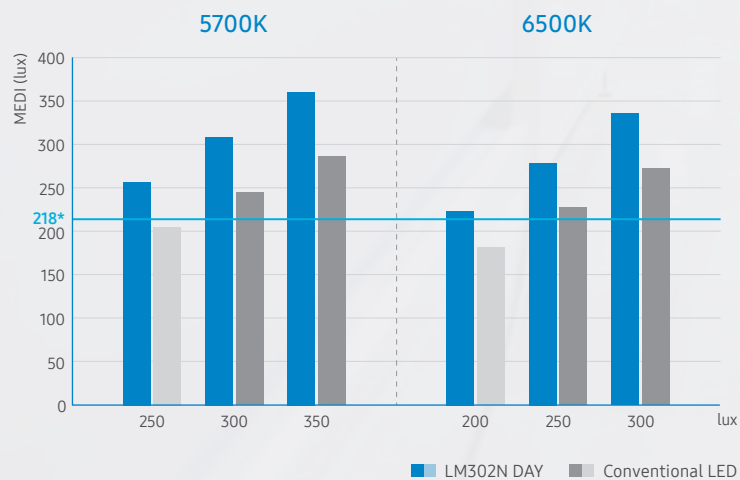
Workers sit in an office for most of the day, while using various devices. Offices should be designed to help them stay engaged and comfortable over long hours. Although cooler lighting is known to alert the body, blue-enriched cool lighting can lead to discomfort and eventually lower work performance. Therefore, both color and alertness effects should be carefully considered when deciding office lighting.

Samsung's Energizing Lighting Solutions between 4000K and 5700K has higher MEDl, regardless of color temperature, and promotes stronger concentration levels compared to conventional LED lighting.





Samsung's Energizing Lighting Solutions between 5700K and 6500K provide cool white lighting with maximized MEDI. With this, factory workers can operate with full focus and avoid accidents during repetitive work.



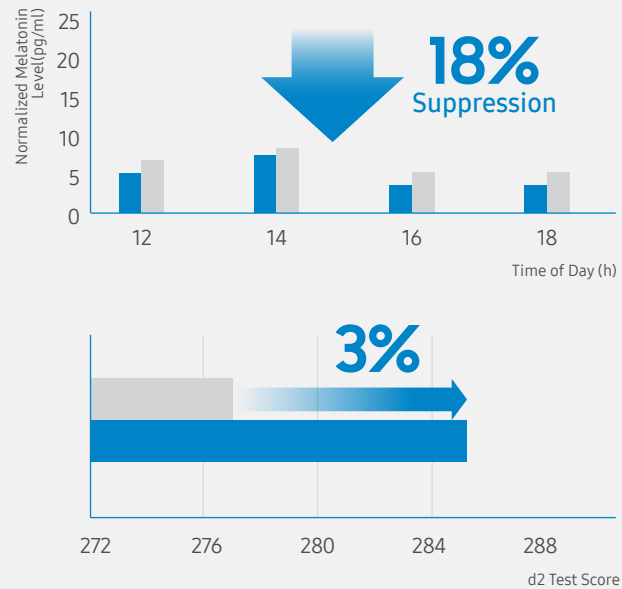
## Safer Factories with Better Results

The importance of lighting is even more crucial in large industrial factories, where tasks require high levels of attention. Any small mistake could lead to a dangerous incident, so workers must stay sharp.

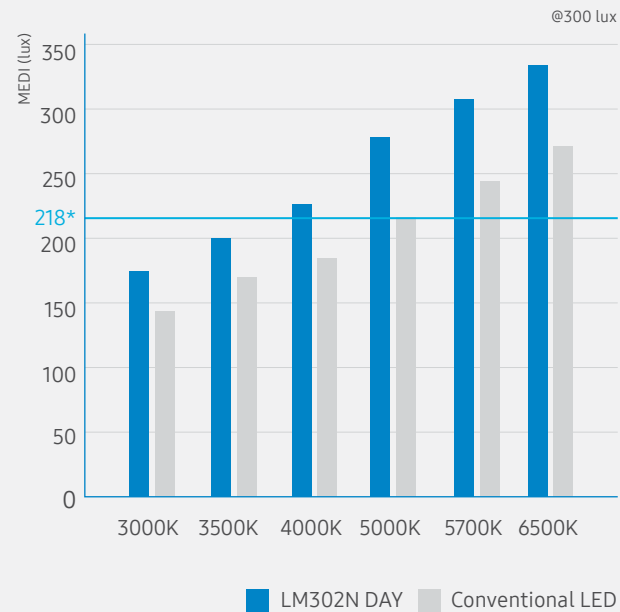
# Lighting for Workplaces

Samsung's Energizing Lighting Solutions with superior MEDI, across a wide range of color temperatures, can help you create the proper lighting environment for work spaces and meeting rooms to boost efficiency and creativity.

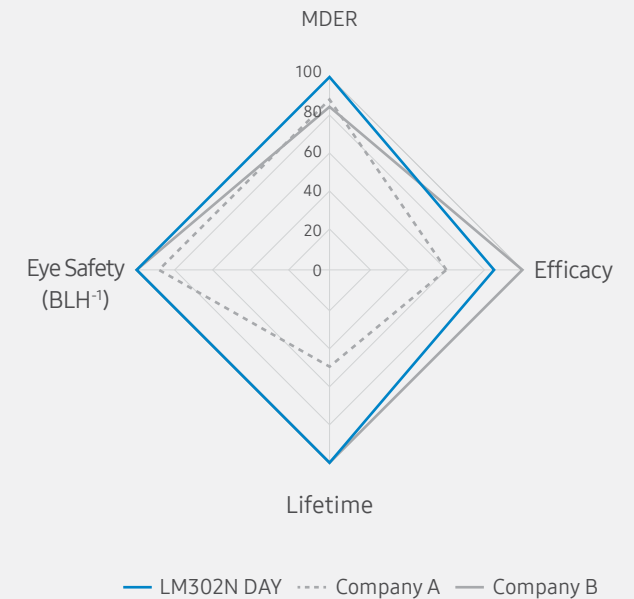
Suppressed melatonin production promotes higher body alertness



Higher MEDI for better concentrating environment



Well-balanced performance across MDER, light efficacy, lifetime and eye safety





# Lighting for Learning Spaces

Many studies show that classroom design – including color, lighting, acoustics and spatial organization – impacts student learning. A landmark study from 2012 found that classroom design alters students' academic progress over a school year by as much as 25% and ongoing research from 2018 suggests that classroom design affects learning by an average of 16%.

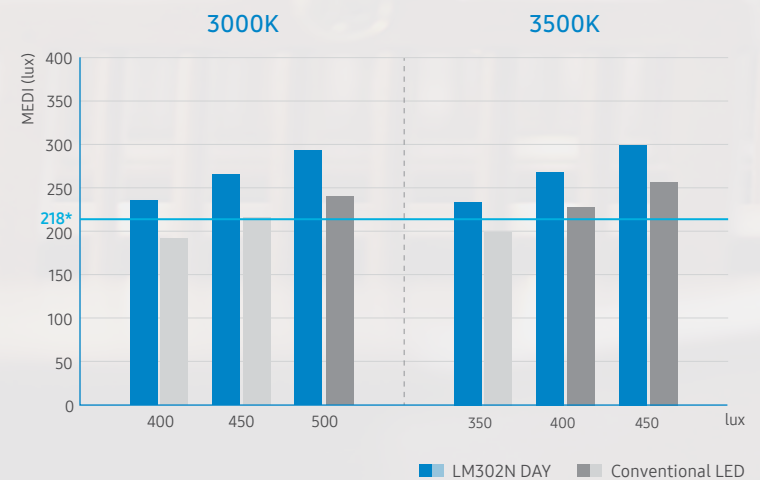




## Peaceful and Productive Libraries

Libraries ideally help students hone in on their studies, but also offer a comfortable atmosphere. As such, their lighting should enhance focus, but also protect the eye health of students who stay in the library for longer hours.

Samsung's Energizing Lighting Solutions at warm color temperatures help you stay sharp in a pleasant and inviting environment. Due to its enhanced physical alerting effects, the solution boosts beta waves even in moderate brightness, which helps prevent eye fatigue.

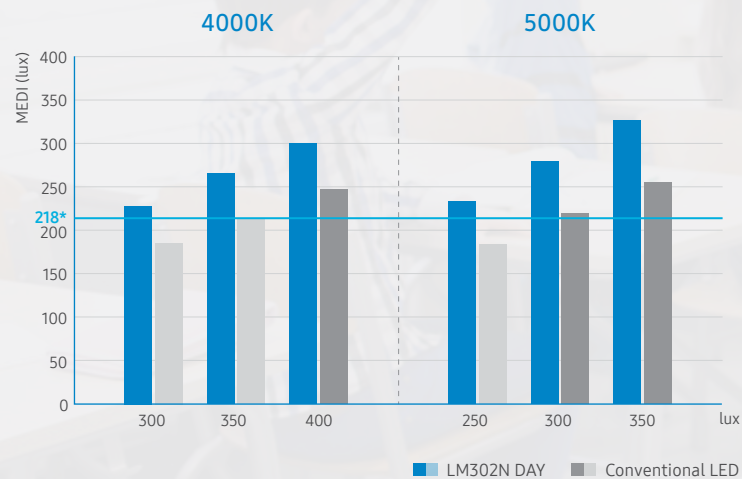




# Classrooms Where Learning Becomes Enjoyable

Classrooms are where new knowledge is delivered. Most curriculum requires students to sit and stare for long periods of time, making it challenging to stay focused. Classroom design must be centered around motivating students, but also protect their eye health.

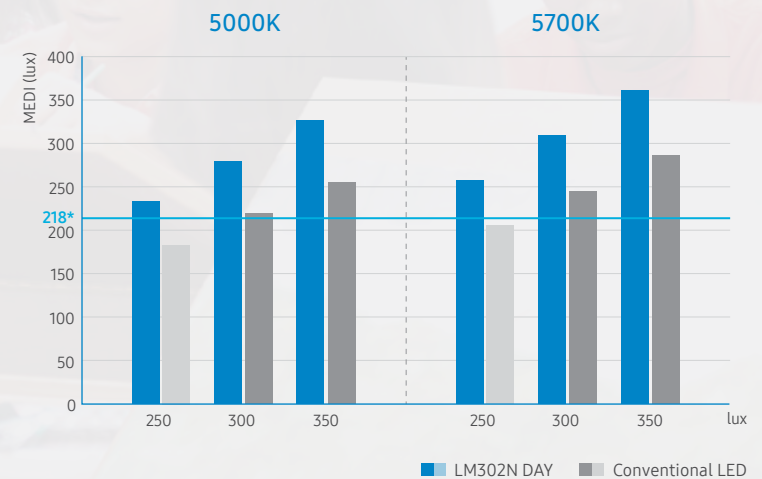
Samsung's Energizing Lighting Solutions from 4000K to 5000K can simultaneously integrate pleasing colors of light with high MEDI to create a refreshing classroom atmosphere where students will stay engaged.



# Art Studios That Spark Creativity

Students get to express their imaginations in art class. When experimenting with colorful projects, it's important for lighting to highlight true hues. And for the human eye to perceive colors accurately, balanced lighting color plays a critical role.

Samsung's Energizing Lighting Solutions between 5000K and 5700K provide a neutral white light that illuminates objects and colors clearly. With its high MEDI, students also remain focused and motivated throughout classes.

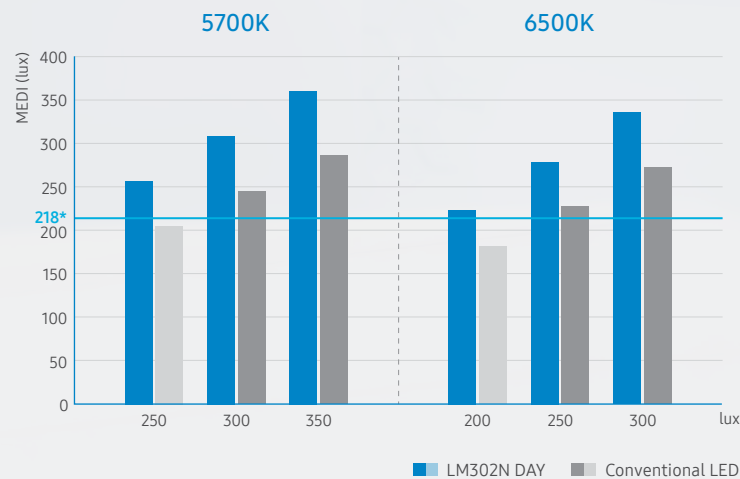




# Lower Risk and Higher Accuracy in Science Labs

Students receive hands-on experience in science labs. These experiments require keen attention to detail, in order to achieve accurate results and avoid accidents when handling dangerous chemicals.

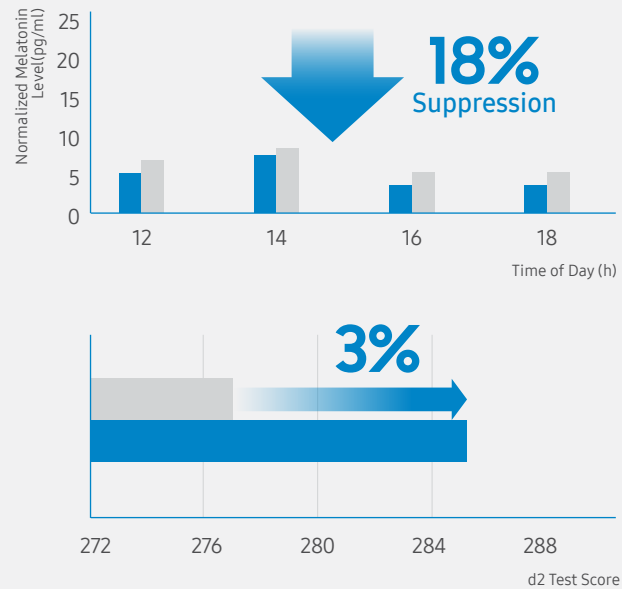
Samsung's Energizing Lighting Solutions above 5700K promotes higher concentration levels compared to conventional LED lighting. Moreover, at the same brightness level as a conventional LED, it provides higher MEDI for a more softly lit classroom environment.



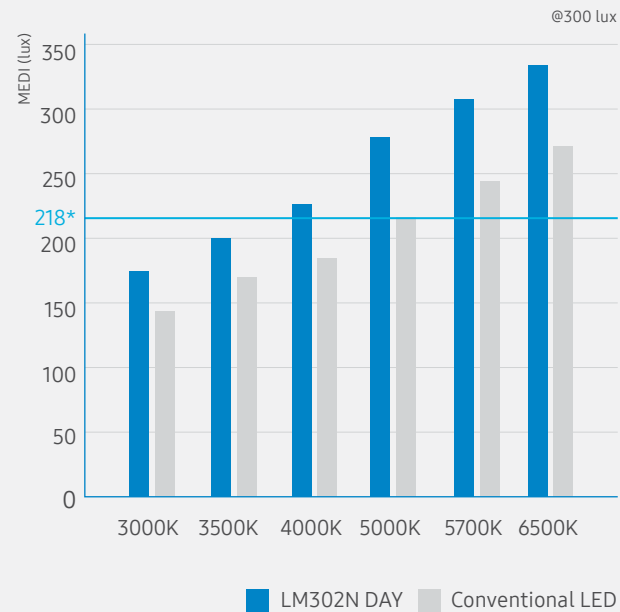
# Lighting for Learning Spaces

Samsung's Energizing Lighting Solutions with superior MEDI, across a wide range of color temperatures, can help shape effective learning environments.

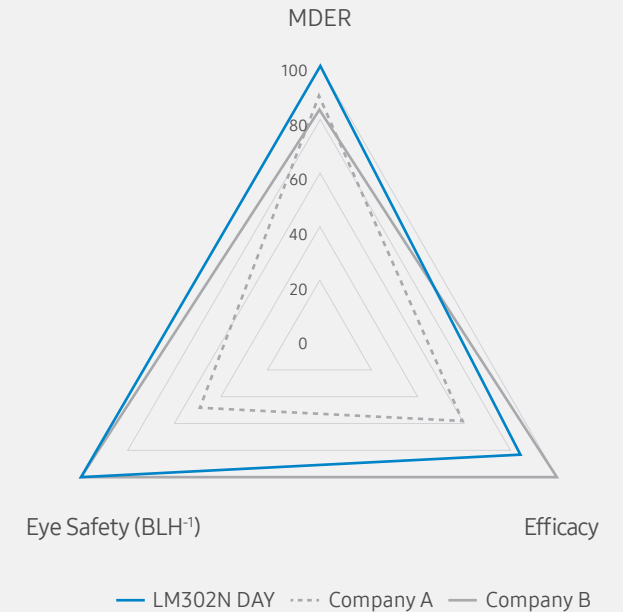
Supresses melatonin production promotes higher physical alertness



Higher MEDI for better concentrating environment



Well-balanced performance across MDER, light efficacy, and eye safety





# Lighting for Living Spaces

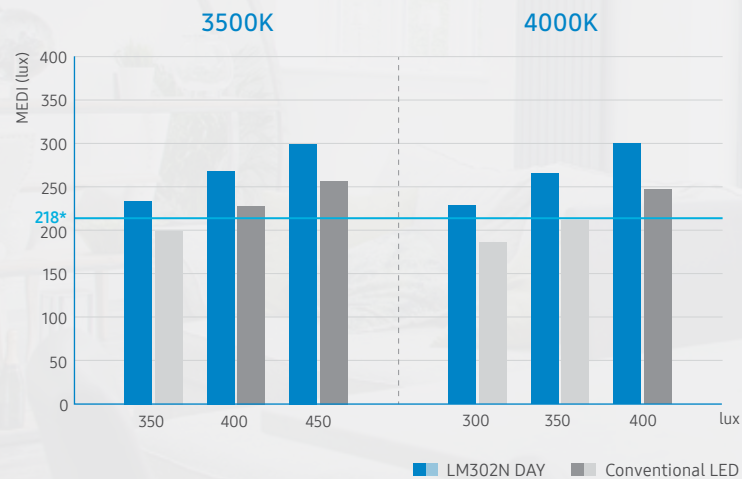
Lighting has a significant influence on the tone and mood of a home. According to Natural Resources Canada, “good lighting can make our homes comfortable, functional and fun places to be, where art and architecture look great and friends and family love to visit.”



# Kitchen for Safe and Delightful Cooking

The kitchen often requires our highest levels of attention. Sharp tools, equipment, and flames pose a bigger risk for accidents and injuries in a moment of distraction.

Samsung's Energizing Lighting Solutions from 3500K to 4000K provide intermediate light to stay alert while cooking and cleaning. Their high MEDI allows you to concentrate in a cozier ambiance, at lower brightness.



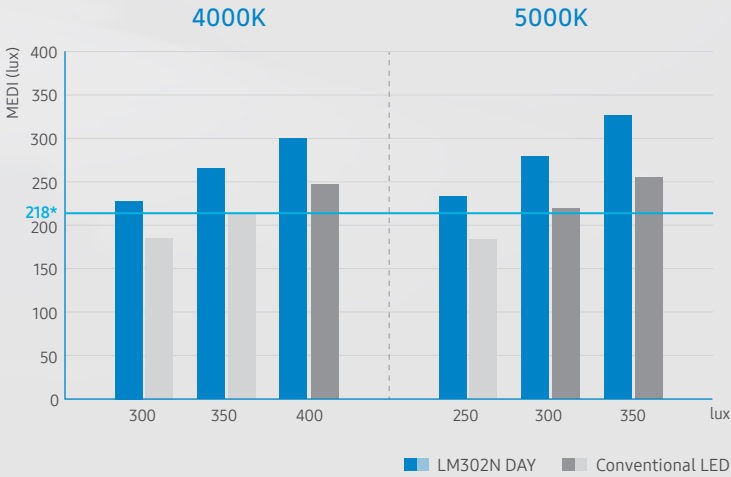




# Growing up and Dreaming Big in Children's Room

Children play, study and sleep in their rooms, making it the most important space in their everyday lives. Because it serves so many different purposes, a child's room requires lighting that can support a variety of activities.

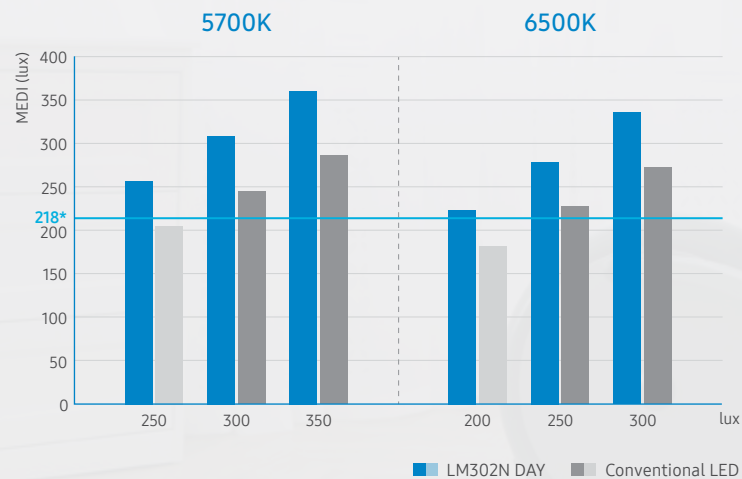
Samsung's Energizing Lighting Solutions from 4000K to 5000K help children focus and perform better academically. At moderate brightness levels, it reduces eye fatigue and still delivers superior MEDI than a conventional LED with high light output. The solution can also be adjusted to achieve deeper, better quality sleep.



# Home Gyms That Bring You the Best Results

Home workouts are becoming a new normal with the increased interest in health and well-being. As a result, many people are devoting specific spaces in their houses for exercise. And with the right lighting, working out can be even more effective.

Samsung's Energizing Lighting Solutions from 5700K to 6500K provide cool white light for peak physical alertness. You can get the most out of your workouts by mentally zoning in on the muscles you use to power your movement and concentrate on your routine.

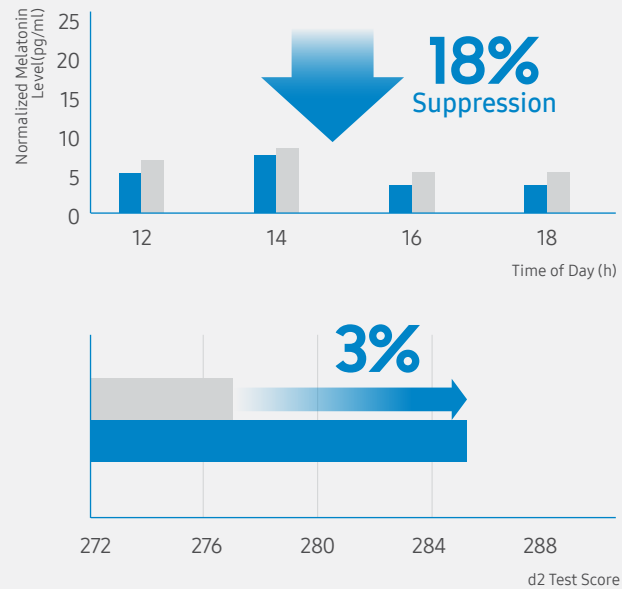




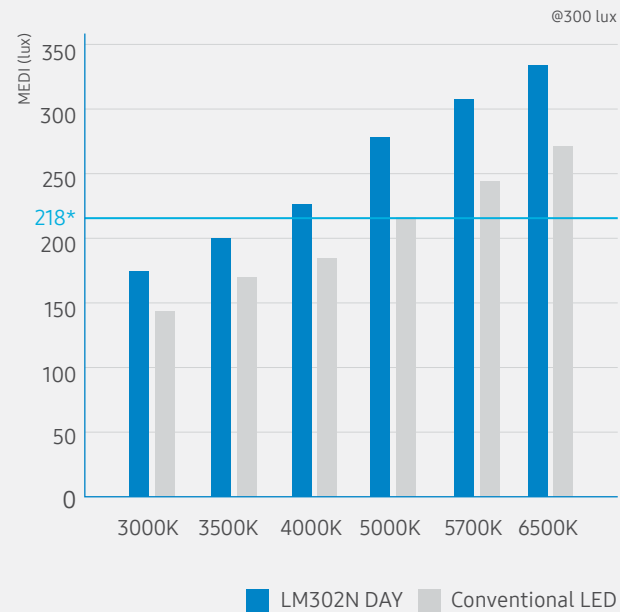
# Lighting for Living Spaces

Samsung's Energizing Lighting Solutions with superior MEDI, across a wide range of color temperatures, can shape your home into a more intimate, welcoming and productive space for your day to day needs.

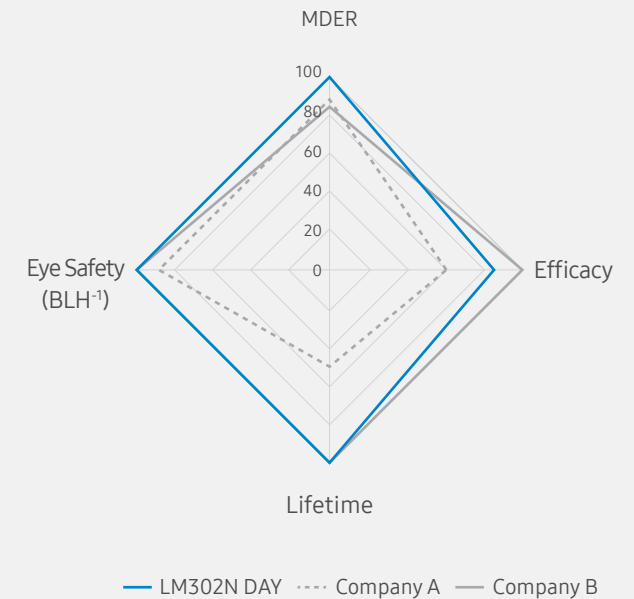
Supresses melatonin production promotes higher physical alertness

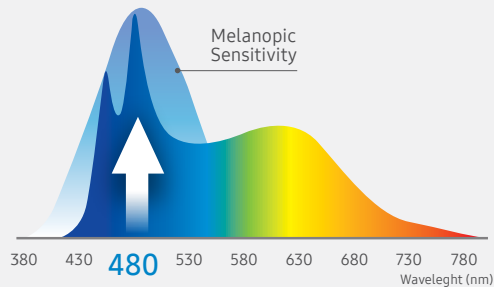


Higher MEDI for better concentrating environment



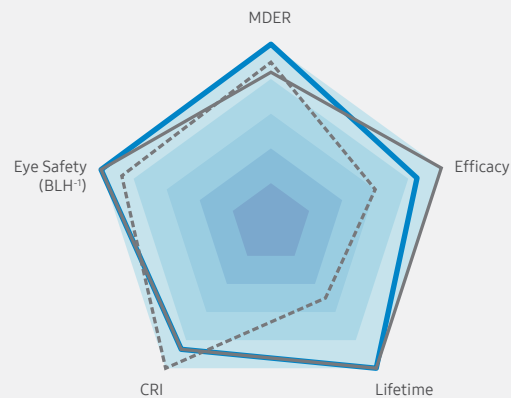
Well-balanced performance across MDER, light efficacy, and eye safety





### Advanced Spectrum Engineering Technology

Increases concentration levels by regulating blue light to affect melatonin production levels



### Applicable to Almost All Indoor Lighting

A well-balanced lighting solution that delivers exceptional visual and non-visual qualities



### The Right Light for the Right Places

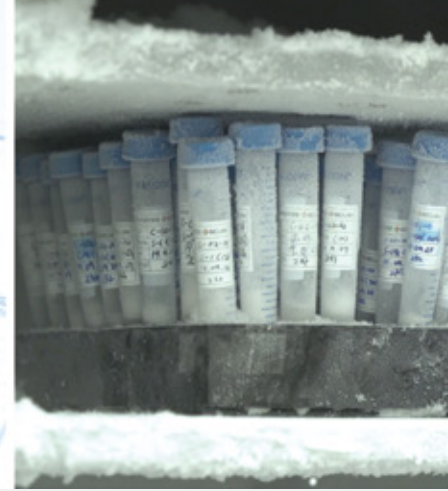
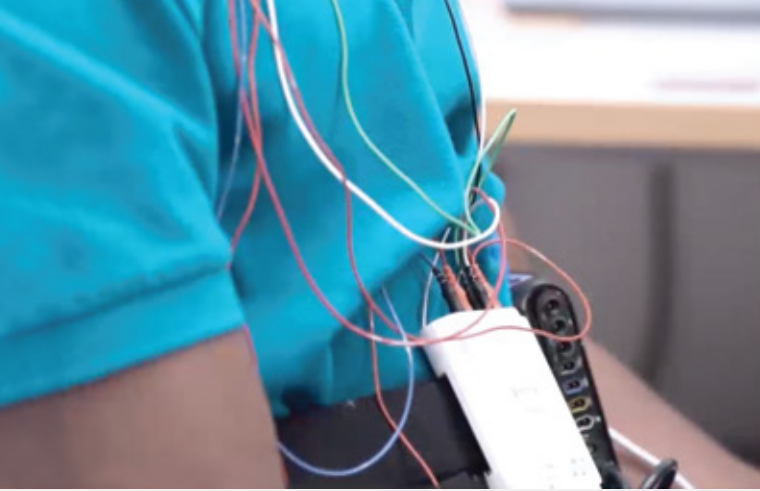
The only lighting solution that suits and enhances the purpose of each space



### Meets WELL Building Standards

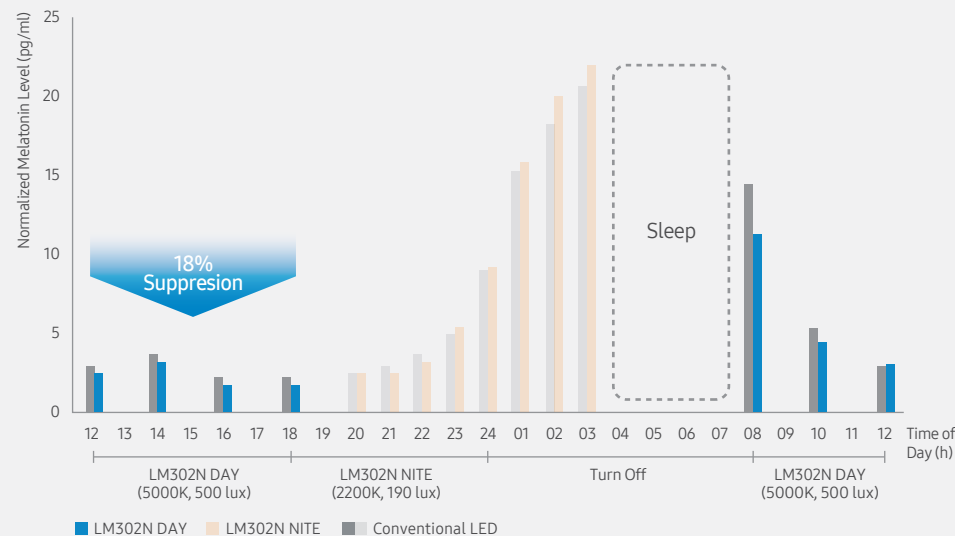
Fulfills WELL V2 standards for circadian lighting that require 218 MEDI for all spaces, except dwelling units





Meticulously executed clinical tests proved that Energizing Lighting Solutions successfully suppress melatonin, resulting in higher alertness and focus.

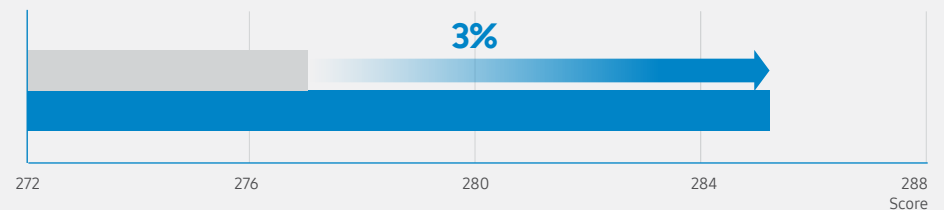
### 18% lower melatonin level under LM302N DAY than conventional LED



\* 30 people between 20s and 50s from April 2019 to February 2020; 3 days and 2 nights under each lighting, Daytime (5000K, 500 lux) and Nighttime (2200K, 190 lux) in random order

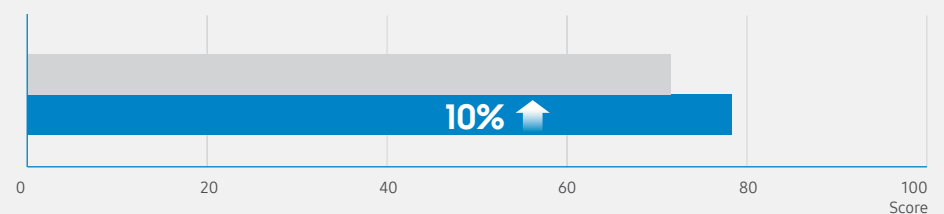
### Lower melatonin level promotes higher physical alertness

#### d2 Test of Attention



\*d2 Test of Attention: Assessing attention and visual scanning speed levels by crossing out any "d" with two marks

#### Sudoku Test



Comes in world's popular LED package platforms,  
Samsung's Energizing Lighting Solutions fit into various indoor lighting designs.

### LM302N DAY



- Maximization of Melanopic Ratio
- 0.76 MDER @ 4000K, 150 mA, 25°C
- 0.9 W, 6.1 V 3030 mid-power LED

#### Specifications

CRI	CCT (K)	Part Number	Luminous Flux (lm)		MDER*	M/P Ratio*
			Bin	Range		
80+	3000	SPMWH3326FC5FAV☆S0	S0	110-125	0.59	0.65
	3500	SPMWH3326FC5FAU☆S0	S0	110-125	0.67	0.74
	4000	SPMWH3326FC5FAT☆S0	S0	115-125	0.76	0.84
	5000	SPMWH3326FC5FAR☆S0	S0	115-130	0.93	1.03
	5700	SPMWH3326FC5FAQ☆S0	S0	115-130	1.03	1.14
	6500	SPMWH3326FC5FAP☆S0	S0	115-130	1.12	1.24

### LM283N+ DAY



- Maximization of Melanopic Ratio
- 0.76 MDER @ 4000K, 100 mA, 25°C
- 0.9 W, 9.4 V 2835 mid-power LED

#### Specifications

CRI	CCT (K)	Part Number	Luminous Flux (lm)		MDER*	M/P Ratio*
			Bin	Range		
80+	4000	SPMWHHD29AQ5SGT☆RM	RM	112-132	0.76	0.84
	5000	SPMWHHD29AQ5SGR☆RM	RM	112-132	0.93	1.03

※ ☆ can be "0" (MacAdam 5 step), "3" (MacAdam 3 step), "Y" (Kitting)

\* MDER: Melanopic Daylight Efficacy Ratio

\* M/P Ratio: Melanopic/Photopic Ratio



Complete Your Space with Right Light  
to Make Your Life More Complete





An aerial photograph of a dense urban skyline at dusk. The sky is a deep blue with some light clouds. Numerous skyscrapers are visible, their windows reflecting the ambient light. A prominent, very tall, blue-tinted skyscraper stands out on the right side. In the center, the word "SAMSUNG" is overlaid in a large, white, bold, sans-serif font. Below the logo, there is a block of white text providing copyright information, the company name, its address, and its website.

# SAMSUNG

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