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INTERVIEW

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'LEDs Revolutionised Consumer Preferences with Smart Controls and Versatile Features'

Architectural lighting design enhances a space by highlighting features, textures, and materials, while manipulating shadows. It also sets the emotional tone, using warm light for comfort and intimacy and cool light for sophistication, said Sharmila Kumbhat, Director, K-Lite Industries Pvt Ltd. while speaking to Prasenjit Chakraborty.

Q The lighting industry has seen significant advancements in both design and technology in recent years. What are some of the most exciting innovations currently shaping the future of architectural lighting?

Application of LED in architectural lighting has scaled up to a very high level and therefore the associated demand to get (a) higher light output per watt for effective energy savings, (b) design flexibility with controllers, (c) dimming and colour options etc., have resulted in some exciting innovations in LED technology to shape the future of architectural lighting. We have already been experiencing the smart lighting systems and the impact of Internet of Things (IoT) for intelligent controls and personalised lighting experience, application of geo-fencing under smart lighting controls etc., Recently 3D printing technology is finding applications for tailored solutions in each application / building as also for predictive maintenance or end of life indication.

Pride India, Balapur, Hyderabad

Q With growing concerns about energy consumption and environmental impact, how is the lighting industry addressing sustainability? What role does energy-efficient lighting play in modern architecture, and how are architects incorporating it into their designs?

Lamps from incandescent, FTL, CFL up to High Pressure lamps are very large in size compared to the tiny LED. The conventional lamps require much bigger luminaire body. Further the FTL/CFL/ high pressure lamp's manufacturing process uses mercury which are harmful to environment. LED, as a light source is the most energy efficient source compared to the earlier incandescent, FTL/CFL/ MV/ SV/ Metal Halide etc., and its life span is around 50000 burning hours. Sustainability is mainly addressed through reduced energy consumption due to the switching over to LED on a mass scale which has already proved its worth by reduction of environmental pollution levels. Over and above the long-life span of these sources has also contributed to sustainability. By virtue of the Internet of Things (IoT), smart controllers and controllable colour changing options, the Architects can easily create comfortable and productive work spaces while minimising unnecessary lighting. Tactfully the designers also incorporate day light harvesting and utilise reflective surfaces to distribute natural light effectively.

Q As smart home technologies gain traction, how is the lighting industry integrating these systems into architectural projects? What are the challenges and opportunities in creating intelligent lighting solutions for both residential and commercial spaces?

Consequent to the development of smart lighting, the lighting industry is integrating smart lighting systems into architectural projects by incorporating connected LED fixtures, sensors, and control hubs that can be seamlessly managed through apps, allowing for customized lighting scenes, automated adjustments based on occupancy or daylight levels, and remote control, ultimately enhancing the user experience and promoting energy efficiency in both residential and commercial spaces. The challenges in such attempts are (a) ensuring inter-operability between different systems, (b) addressing privacy concerns related to data collection, and (c) designing aesthetically pleasing fixtures that integrate seamlessly with the architecture.

Al Emadi Palace, Qatar

Q Beyond functionality, lighting has become an essential tool in architectural expression. How do you see lighting being used as a design element to enhance the aesthetics and atmosphere of a space?

In architectural lighting design, additional design elements come into play a significant role. They are mainly to highlight the architectural features bring into focus the textures and materials, manipulate shadows. The designers can also bring into play the emotional tone of a space through warm lights to create a sense of comfort and intimacy and through white cool light, feelings of sophistication and modernity. In turn, the lighting solutions are tailored to the desired mood and atmosphere.

New Parliament of India

Q How are consumer preferences shifting in terms of lighting design and functionality? Are there any emerging trends in colour temperature, smart controls, or fixture designs that architects should be aware of when specifying lighting for their projects?

Gone are the days when the clients will be happy with a good lighting level as they choose. LED has transformed the whole scenario and the preference of consumers have drastically changed due to the various options available to them through colour tuning to suit different moods and activities, smart controls etc., The emerging trend in lighting design has to address-

(a) Human-Centric Lighting: Mimicking natural daylight patterns by adjusting colour temperature throughout the day to support circadian rhythms and enhance well-being. (b) Smart Controls and Integration: Voice-activated systems, app-based control and integration with other smart home devices for personalized lighting experiences. (c) Colour Tuning: Precise control over colour temperature to switch between warm and cool tones depending on the desired ambiance, (d) Minimalist Fixture Designs: Sleek, streamlined fixtures with clean lines and integrated LED technology and (e) Natural Day Lighting: Incorporating natural light patterns and colour variations to connect occupants with the outdoors. ■