

Capping Invisible Flickering in LEDs: Orient Electric



Orient Launches EyeLuv

ORIENT ELECTRIC IS CONFIDENT THAT ITS NEWLY LAUNCHED EYELUV RANGE OF LED LIGHTS, WHICH HAS BEEN DESIGNED TO CAP INVISIBLE FLICKERING, WILL SOON BECOME THE INDUSTRY NORM AS IT MITIGATES HEALTH IMPLICATIONS AND ALLOWS END-USERS TO ENJOY LIGHTING FEARLESSLY.

Recently, there was a commendable gathering of journalists in New Delhi. The invitation had come from one of the country's most progressive electrical & lighting majors, Orient Electric Ltd., to announce the expansion of its LED lighting portfolio with the launch of EyeLuv series LED Lights. The company used this platform to demonstrate how this new series is different from all the existing LED lighting products irrespective of brands, and how it would soon become a norm in the industry.

Orient Electric Ltd., part of the diversified \$2-billion CK Birla Group, has expanded its LED lighting portfolio with EyeLuv series

LED lights range. The USP of this range is that it comes with flicker-control technology (FCT) that reduces the invisible flicker, which is hard to identify. The company personnel showed an easy way to check the flicker that is present in almost all substandard LED lights, besides being a permanent feature of fluorescent light sources. One can find out if the light flickers, simply by switching on the video of the smartphone in slow motion facing the light in question.

The announcement was then followed by screening of a video, which actually was the new TVC that the company launched the same day. It clearly shows the extent of

flickering in the existing LED lights, which is extremely harmful to people's eye and health. Attendees tried and captured the same with their smart phones using the slow motion feature. Eventually, it became the cause of concern for many of them who then became inquisitive about this. A lot of questions were raised, which were very tactfully handled by **Rajiv Makhni**, a technology aficionado and managing editor with NDTV.

In fact, Makhni took over the responsibility to represent the journalists gathered therein and get addressed their queries by the panel of experts during the discussion. Members of the panel comprises company personnel including **Rakesh Khanna**, MD & CEO, Orient Electric Ltd.; **Puneet Dhawan**, the company's Executive Vice President; **Srihari Madhava Rao**, Chief Innovation Officer at Orient Electric; and an Ophthalmologist **Dr. Harbans Lal**, who has 36 years of experience and currently practices at Sir Ganga Ram Hospital in New Delhi. Makhni moderated the discussion and put forth all the possible questions.

What is flicker?

Flicker is the rapid change in brightness of LED light, and it is of two types, visible and invisible. Visible flicker can be easily detected by eyes owing to its low frequency, generally below 100 hertz, and hence it is easier to control or avoid.

The invisible flicker is the one that we all are concerned with. It is difficult to detect with naked eyes because of the speed of fluctuation, the frequency of which goes above 100 hertz. This flicker in the light is seen sometimes in form of striations, and sometimes just as a strong flicker.

This invisible flickering causes various health complications including its harmful effects on eyes. Studies have revealed that prolonged exposure to flicker emitted by LED lights with flicker percentage above 30% can lead to negative health impact such as eye strain, headaches, blurred vision, fatigue, apparent slowing or stopping of motion, reduced visual task performance and in some cases, neurological problems.

Leading with a Difference

Responding to Makhni's question on how he sees the prospect of this remarkable innovation, Khanna says, "It will soon become a norm to opt for safer and healthier flicker-free-controlled LED lights. We firmly believe that this development is sure to become a game changer in the industry." He suggests that awareness on



The Panel (L-R): Rajiv Makhni, Managing Editor, NDTV; **Puneet Dhawan**, Executive Vice President, Orient Electric Ltd.; **Rakesh Khanna**, MD & CEO, Orient Electric Ltd.; **Dr. Harbans Lal**, Ophthalmologist, Sir Ganga Ram Hospital, New Delhi; **Srihari Madhava Rao**, Chief Innovation Officer, Orient Electric Ltd.

the subject is still at a nascent stage when it comes to general consumer, while largely known to the manufacturers. "In West and the US, this had been taken up since 2016. In India, media has been talking about it since last few months, but still believe that level of awareness is limited and not far reaching."

Addressing on how Orient could identify the said problem in LED lights, he insists that innovation and R&D have been pivotal to the company's success. Orient's ability to exploit and adapt technology to the best has helped it to continuously create differentiation that the new age customers expect. "Keeping our consumers at core, we have always focussed on building sustainable competitive advantage through a culture of innovation - in almost all the segments that Orient is present in - be it fans, switches, or lighting. We are the first Indian lighting brand to get BEE 3- & 5-Star rating for LED bulbs. We are the first in creating awareness about the flickering problem in fluorescent tubelights thereby

triggering their replacement with LED battens. Now with the launch of EyeLuv range, we have once again showcased our thought leadership in the category."

According to Khanna, the choice was to invest in lighting R&D in many facets including how to bring in more efficiency etc. "However, we chose to invest in an area which has dramatic implications on human health. We are happy to say that we have a solution for this flicker which is affordable and takes care of all the ill impacts of invisible LED flicker. Our continuous investment in building up competence and innovation centre has helped us not only to bring differentiation, but also bring down costs while gradually becoming globally competitive. Our focus will remain on driving sustainable competitiveness through innovation, while addressing the consumer need gaps."

Driving Innovations

Elaborating on the R&D story behind this new EyeLuv LEDs range, Rao informs that

the edge Orient Electric has today in the market is because of its investment drive in manufacturing and having an integrated R&D and competency centre which works on various elements, but focuses largely on electronics and design of drivers as well as PCBs for LED products. "While we started working on this subject almost a year ago, we tested all the products from major brands in the country for flicker percentages. All the lights that were tested had flicker percentage ranging on an average of 60-80 %, which is far higher than the threshold limit of 30%."

Rao goes on adding, "For developing the EyeLuv range, we evaluated different technology solutions with the prism of affordability and then selected the most apt one. We conducted researches in NABL-accredited labs to test how Orient EyeLuv performs in comparison with LED lights of other well-known Indian brands. The outcome of the tests evinced that EyeLuv LED products were better in terms of productivity levels of people and health effects. The testimony of the fact is that Orient EyeLuv LED lights have been awarded a certificate of recommendation by the Indian Medical Academy for preventive health (IMAPH)."

Drawing a line between the harmful effects of Blue Light and flickering, Rao highlights that the latter is pretty different. "Flicker is about variation of light - visible or invisible, which has adverse effect on eye health. On the other hand, Blue Light is about the intensity of specific light wavelength/frequency, which is also known to have adverse effects on human health. There are clear photo biological standards for Blue Light to which LED lighting manufacturers need to comply with so as to cap the harmful impact of Blue Light. However, while the adverse effects of flicker are widely written about in





leading publications and medical journals, a set standard is yet to be made."

Taking on some references, Rao shares that some parts of the world have started to prescribe the safe limit for flickering i.e. 30% as per IEEE standards PAR 1789, California, but there are no such guidelines in India so far. Lighting Europe, which is a leading lighting manufacturers association in Europe – in its position paper on flicker and stroboscopic effect published in September 2016 - also states the possible adverse effects on human health including migraine and aggravation of autistic behaviour and even photosensitive epileptic seizure under prolonged exposure of LED lighting. "The research findings clearly indicate that LED flicker has many adverse health implications and as a responsible brand, we wanted to address the issue."

Adding to the Business

Taking up a question on the impact of this new launch on Orient's business, Dhawan makes his remarks that this portfolio enhancement was significant for Orient. "We are just eight years old in the lighting business, while most of our competitors are there from 30-50 years. Four years ago, we were almost non-existent in the industry, but after switching over to LEDs, we have reached a double-digit market share in the LED bulbs business. We aim to double our chunk in the pie in next 3-4 years and emerge as one of the front-runners in this segment. We currently have two manufacturing units in Noida and have plans to gradually increase capacities for both the segments – electronic drivers and assembling part of the LED bulbs so as to meet the ever increasing demand. Most of the investments will be made towards new product development, quality enhancement and automation and indigenising components."

Tackling the market response over the new range i.e., EyeLuv LEDs, Dhawan very firmly shows his confidence, when he says, "As far as response is concerned, we are positive that Indian consumers will appreciate EyeLuv products range. Launched with flicker control technology, which is meant to lessen the harmful impact of flickering in LED lighting, the range comprises bulbs, battens, and recess panels which together constitute almost 40% of the consumer LED market comprising both homes and commercial establishments. However, it all depends on making consumer aware of this invisible fact and its dire consequences, after which, the changeover will be far quicker."

According to him, health remains a very important aspect for all of us and any conscious consumer will be happy to pay the differential which can not only affect individual, but the entire family. As a percentage point, it may seem that the price difference is high, but it is just Rs. 30, which the company believes that consumers will be willing to pay given the benefits of the technology. This will become a norm in future to opt for flicker-free LED lights. "To spread the awareness, we have already launched our 360-degree campaign including TV, print, OOH and digital to inform the end-users about the adverse health effects of flicker and how one can check it using the smartphone camera."

Dhawan also informs that the new range is readily available with the company's formidable network of 700 distributors catering to the needs of 35,000 retailers, spread across the country. "This apart, EyeLuv products are also there on the online platform through the company's own e-commerce portal besides being sold through other leading market places," he says adding that as awareness amongst the consumers will increase, the demand is likely to soar. "While we cannot quote any numbers here, we are positive that our EyeLuv range of products will soon gain

acceptance across the length and breadth of the country."

Speaking about the patenting of flicker-control technology, Dhawan clarifies, "It is not patented. It is based on generic application of technology which was available in other fields. We have adapted to that technology for use in LED lighting to control the flicker. Keeping in view the same, we at Orient Electric have developed a specific driver and redesigned the electronic components for our EyeLuv range which controls the invisible flicker, thus making it safer for human health."

Health Implications

Last but not the least, it was the turn of Dr. Lal to respond how exactly the invisible flicker of LEDs affects the human eye health, to which, he says, "While there are various studies available which suggest the damaging impact to eyesight, stretching up to seizures, we believe the normal impacts which are already visible with the test reports suggest that the flicker causes eye strain, fatigue, reduces productivity and many other side effects in short term itself. Usually, to accommodate the change in the variation that is taking place in the lighting condition, our pupils keep on dilating and contracting which may cause lot of strain. For visible flickering everyone has option to control or at least avoid, but for invisible flickering it is tough to do any of these as the variations are not known."

Dr. Lal, who is also a member of Delhi Medical Council, suggests that there are a couple of rules to avoid eye-strain. The first is 20:20 which states that after 20 minutes of work, keep your eyes 20-feet away from your workstation for 20 seconds. Another is 40:20 according to which after every 40 minutes of work, take a break of 20 minutes, and if this is not possible, take a 10-minute break after every 50 minutes. Avoid looking towards the LED lights through naked eyes. It would be better if the lights on your workstation or on the study table come from behind.

Conclusion

Orient's EyeLuv range of LEDs is equivalent to BEE 3-Star rated bulbs with lumen efficacy of 100l/w. The range sports a driver that has been designed with flicker control technology to keep a check on the invisible flickering. This shows that the key to mitigating flicker lies in driver, which is the most important component for any LED lighting product. Flicker control technology can eliminate the problem simply by supplying the constant non-oscillating current to LEDs.

In fact, the job of a driver is to provide constant current to keep the LED illuminated and flicker control technology ensures that the current being provided by the driver, limits the fluctuation/ripple, which in turn results in reducing the invisible flicker. This will soon become a norm and may get replicated at the industry level.

