

PRESS RELEASE

Research project combines dynamic daylight and artificial light

New quality of light for work environments

Copenhagen, October 22, 2020. **A new approach to lighting design and technology is the focus of the Double Dynamic Lighting project conducted by the renowned Aalborg University in Copenhagen, supported and accompanied by several leading lighting companies. The research team led by Prof. Ellen Kathrine Hansen is exploring the combination of dynamic daylight and artificial light in a spatial context and opening up a new dimension for architects and lighting experts in supporting individual needs and different working requirements.**

In a unique collaborative project, partners from the fields of lighting technology and solutions, including Tridonic, iGuzzini, Fagerhult and Zumtobel, have been working with Aalborg University for the past three years. “Rethinking Light” was the idea that inspired leading companies in the lighting industry to join forces in supporting new fundamental research into dynamic lighting by Aalborg University in Copenhagen.

The Double Dynamic Lighting (DDL) research project sets the guidelines for comfortable illumination of workplaces by combining direct and diffuse dynamic daylight and artificial light. The new approach of DDL will have a positive impact on perceived atmosphere, visual comfort, and work engagement. The results demonstrate the potential to use new sensor and lighting technologies to meet human needs. The project team produced proposals for lighting scenes based on the natural course of the daylight as well as current sky conditions. By exploring how a responsive lighting technology that reacts to and complements daylight inflow can reconnect man and nature, the findings can help to form a more holistic design approach in the future.



Double Dynamic Lighting

The project is examining the spatial conditions in a dynamic lighting environment and their influence on the well-being of users. Practical design guidelines are being developed, tested and implemented in a series of investigations. This work is being conducted in existing working environments with dynamic light, in lighting laboratories at Aalborg University and in interactive, three-dimensional computer models.

The results of the field study demonstrate that it is possible to define dynamic light settings in response to the dynamics of daylight through a combination of direct and diffuse lighting. DDL was validated to have a positive impact on perceived atmosphere, visual comfort, and work engagement compared to static lighting. In general, it was confirmed that the combination of directional task lighting and diffuse ambient lighting in response to sky types and measured daylight levels in the workspace was preferred to standard static diffuse lighting.

An analysis of responses from interviewees reveals a large difference in perceived visual comfort between dynamic and static lighting periods, indicating that working with light zones and with direct and diffuse lighting components and uneven light distribution enable a high level of visual comfort to be achieved. The industry partners added their practical application knowledge and worked hand in hand with the university.

Prof. Ellen Kathrine Hansen, Head of Lighting Design in the Department of Architecture, Design & Media Technology, has this to say about the study: “The aim of the study is to apply an innovative mix of methods to create a holistic approach to lighting planning which can then function as a seal of quality in the lighting industry. A combination of biological, aesthetic and functional aspects will form the basis for the design process.”

www.light.aau.dk/DDL



Statements from the participating companies:

Karin Zumtobel-Chammah

Chairwoman Supervisory Board, Zumtobel Group AG

A fundamental element of our DNA is our desire to improve health and well-being by providing the best possible light for both people and the environment and by customising lighting solutions to the different areas of application. And of course, our research and development projects constantly aim to achieve these improvements.

We identified a great overlap between our research topics and the DDL project so we were convinced that the findings of this research on combining daylight and dynamic lighting technology would contribute to better health and well-being, and would help us understand certain topics much better. Working on a major project with different partners always augments the quality and relevance of the results. The set-up of this project was especially interesting, because some of the partners are actually our competitors. But since all of us were purely interested in investigating how the combination of daylight and dynamic lighting can contribute to better health and well-being, we were able to join forces and drive industry knowledge forwards.

Henrik Clausen

Director of Fagerhult Lighting Academy

For us it's also about knowledge. It is a challenge to enhance our general lighting knowledge. We need to do that in order to take advantage of all the possibilities for health and well-being that lighting can give us.



Double Dynamic Lighting

We need to educate to create better awareness of how daylight and electric light function together. To get a handle on how to combine the dynamics of daylight and the dynamics of electrical light in the same installation. That's the basis of Double Dynamic Lighting. We need to spread this knowledge of how to combine daylight and electric light among lighting professionals in terms of design, planning, application and sales.

We have been working with Aalborg University on the research side of the DDL project because everything we do in product development and in sales is geared to bringing evidence-based lighting solutions to the market. Now we are preparing to bring knowledge to our partners, our staff and students in order to give them all a competitive advantage in the (still static) lighting market.

Peter Roos

Product & Project Solutions Director, iGuzzini

iGuzzini has always considered light as a tool for social innovation that can improve people's lives and well-being at every moment of every day. That is why our vision is 'Social Innovation through Lighting' and the reason why we have been conducting research on biodynamic light together with leading universities and institutes worldwide since 1988.

The idea of the DDL research is to find new lighting design guidelines for workspace lighting which will improve the well-being of end users. So in the first instance it will be "all of us" living and working in spaces illuminated by applied DDL design guidelines who will benefit from the DDL research findings. We at iGuzzini believe that the lighting design community together with architects and lighting professionals will embrace the idea of Double Dynamic Lighting to create beautiful spaces we'll love to live in.



Double Dynamic Lighting

Hugo Rohner

CEO Tridonic

As a technology company of the lighting industry, Tridonic enables new solutions for customers and partners. DDL is a wonderful new challenge for us. We are transferring this fundamental research into solutions for our business partners. The first installation, which was set up at Aalborg University, is a great model for us and we are continually integrating the research in our installation at our headquarters and enabling our partners to have a DDL installation at their locations. In this way, we can learn more and continually develop the technology which is needed to implement DDL. We are sure that DDL will pave the way to lighting solutions which will provide individual answers to human needs and requirements.

Picture: Dynamic Light Settings

Dynamic light settings can be defined through a combination of direct and diffuse lighting. The DDL results show an impact on perceived atmosphere, visual comfort, and work engagement compared to static lighting.

Credits: Multivideo - iGuzzini

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About Tridonic

Tridonic is a world-leading supplier of lighting technology, supporting its customers with intelligent hardware and software and offering the highest level of quality, reliability and energy savings. As a global driver of innovation in the field of lighting-based network technology, Tridonic develops scalable, future-oriented solutions that enable new business models for lighting manufacturers, building managers, systems integrators, planners and many other types of customer.

To promote the vision of the “Internet of Light”, Tridonic relies on partnerships with other specialists. The goal is the joint development of innovative technological solutions that convert lighting systems into intelligent networks and thereby enable associated services. Its profound, technical industry expertise makes Tridonic an ideal partner for established brands and for newcomers to the market.

Tridonic is the technology company of the Zumtobel Group and is headquartered in Dornbirn, Austria. In the 2019/20 fiscal year, Tridonic achieved sales of 341.4 million euros. 1,932 highly skilled employees and a worldwide sales presence in over 70 countries provide the basis for developing and launching new, smart and connected lighting systems.

www.tridonic.com/ddl



Double Dynamic Lighting

About iGuzzini

Founded in 1959, iGuzzini illuminazione is an international leader in the field of architectural lighting with around 1,450 employees. The company is dedicated to the study, design and production of smart indoor and outdoor lighting systems in collaboration with the best architects, lighting designers, designers and research centres from all over the world. Based in Recanati (Italy), it operates in over 20 countries spread across five continents. iGuzzini uses light to improve the relationship between human beings and the environment, through research, industrial manufacture, technology and knowledge, which it applies to cultural, work, retail and city locations and the infrastructure and hospitality & living sectors. Consolidated revenues in 2019 amounted to €237.7 million. As of 2019 iGuzzini is part of the Fagerhult Group. For further information: www.iguzzini.com.

About Fagerhult

Originated in the dark Swedish forest, the importance of light is crucial to us. For 75 years, the same principles remain: creating sustainable lighting solutions that help everyday activities. We know that light affect us visually, emotionally and biologically. When these aspects are in perfect harmony, we truly provide enhancing lighting experiences for people.

Fagerhult develops, produces and markets professional lighting solutions for public environments such as offices, schools, retail areas, hospitals - indoor and outdoor. Our lighting knowledge, in combination with a wide range of innovative and energy efficient lighting solutions, makes us a natural partner for the entire project. Fagerhult is a part of the Fagerhult Group, one of Europe's leading lighting companies with 4,700 employees in 28 countries around the world. www.fagerhult.com

About Zumtobel

Zumtobel has been developing the highest quality of lighting solutions tailored to the individual's needs for 70 years. With a comprehensive portfolio of high-quality luminaires, the Austrian lighting specialist provides the right light for every application at any time of day or night. As a leader in innovation, Zumtobel follows an outstanding design approach to continuously push the boundaries in search for perfection through unique and timeless design. As the international supplier of integral lighting solutions develops the next generation of lighting, it builds on its family heritage to refine the aesthetics of light and improve the quality of life through light. Zumtobel is a brand of the Zumtobel Group AG with its headquarters in Dornbirn, Vorarlberg (Austria). www.zumtobel.com

Zumtobel. The Light.

