CommONEnergy

Bartenbach

durlum

ARTIFICIAL LIGHTING

HYBRID LED SPOT

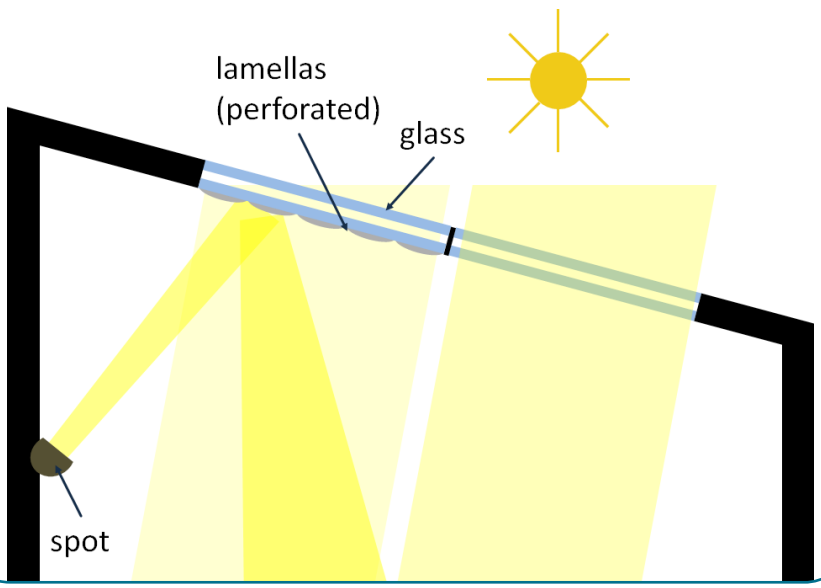
Shopping centres quite typically feature multi-storey galleries. In many situations, projector/mirror systems are employed to illuminate the gallery indirectly by redirecting the light from a spot luminaire over a mirror to the ground.

These systems are already quite common in existing shopping centres due to their good visual properties, easy maintenance and improved aesthetics in night situations (avoiding a completely dark roof). However, existing systems suffer from their energy inefficiency, due to the use of outdated technologies for the projector and the mirror.

The newly developed spot luminaire Hybrid LED Spot overcomes these inefficiencies by using highly-efficient LEDs and special hybrid optics with a very narrow beam angle. It has been shown that the efficiency can be improved from around 35 % for conventional projectors to 80 % for the Hybrid LED Spot.

TECHNOLOGY

The Hybrid LED Spot is mounted to a wall adjacent to the area to be illuminated. Its light gets redirected to the ground via mirrors mounted to the roof.



USE

The main application for the Hybrid LED Spot is its use in a projector/mirror system for indirect illumination of, for instance, multi-storey galleries. Here, the spot is mounted to a wall adjacent to an atrium. A specifically-shaped mirror is mounted on the roof of the atrium, redirecting the light from the spot to the ground.

Existing projector/mirror solutions can also be found quite often in shopping centres, but suffer from low efficiency, thus prone for retrofitting with the new Hybrid LED Spot and respective mirrors. The Hybrid LED Spot is available with different beam angles and two different power classes, allowing to adapt to different onsite situations.

FEATURES

The Hybrid LED Spot comprises 7 (or 14, resp.) high-efficiency glass lenses (η>90 %) that shape the light of efficient LEDs to a narrow beam angle of 6° (different beam angles up to 20° possible). Furthermore, the specifically-shaped mirror which redirects the light from the spot to the ground can also be designed with a rather narrow or wide redistribution angle. Thereby, the system can be applied in various building geometries (e.g. different height or declinations of roof). Different light temperatures are possible for the luminaires, which can be dimmed via DALI, allowing further reductions in energy consumption using intelligent control strategies (e.g. avoiding unnecessary high amount of light, especially in daylit areas). With a mounting bracket on the backside, the luminaire can be installed and adjusted for many situations. The system can easily be combined with a daylighting system, as it is done with the Modular Skylight, another system developed in the CommON*Energy* project.

A further application is to use the technology as a so-called artificial sun, the Hybrid LED Spot being employed as a suspended luminaire creating artificial sunspots on the gallery ground.

CONTACT DETAILS

info@durlum.de
www.durlum.de

info@bartenbach.com
www.bartenbach.com

The project CommON*Energy* (2013-2017) focuses on transforming shopping centres into energy efficient buildings, by developing smart renovation strategies and solutions to support their implementation as well as assess their environmental and social impact.

- 3 demo cases, 8 reference buildings & 23 partners from across Europe
- 25 technologies developed and installed in 4 years
- Up to 75% reduction of energy demand, leading to costs reduction
- A payback time of maximum 7 years

INNOVATIVE POTENTIAL

Combination of energy efficiency (efficient LED technology and novel optical components) and high-quality lighting (good visual properties due to secondary light distribution via a mirror).

BENEFITS

- Low energy consumption directly (efficient LED technology and optical components) and indirectly (reduced excess heat and therefore required cooling loads of the building)
- High visual comfort with the secondary light distribution via a mirror
- Easier luminaire maintenance (compared with mounting of the luminaire directly to the roof)
- Low maintenance effort / cost, no change of lamps necessary
- The system can be combined easily with a daylighting system
- High potential for retrofitting as this type of system is already often in use in shopping centres, however mostly with outdated technology / low efficiency

COMPATIBILITY WITH OTHER TECHNOLOGIES

This artificial lighting system is compatible with the standard DALI protocol.

CASE STUDIES

The system will be implemented in the demo case of Trondheim, Norway.

CommONEnergy

The Comm*ONEnergy* project has received funding from the European Union Seventh Framework Programme (FP7/2007-2013) under grant agreement n. 608678

WWW.COMMONENERGYPROJECT.EU