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Innovative tunnel lighting system for greater safety

LMT Leuchten + Metall Technik GmbH from Hilpoltstein/Germany develops a special LED tunnel luminaire with innovative lighting technology, for better safety and comfort in road tunnels and underpasses.

Hilpoltstein, 24. February 2020 – Road tunnels and underpasses are an important part in planning and implementation of traffic networks. They are indispensable wherever local conditions do not allow for a different route, they cut off paths and serve as protection against noise and exhaust fumes.

Proper illumination of the tunnels is an important aspect for reducing hazardous situations, as accident-prone areas can be detected more quickly and better. If an accident or fire occurs anyway, good lighting creates the best possible visibility conditions to enable a safe and panic-free evacuation of the road users involved in an emergency.

The added value of lighting systems is obvious: in addition to ensuring optimum visual conditions at any time of day or night, they help car and truck drivers to drive without fatigue, on the one hand by reducing eye irritation by too much (light) information, on the other hand also by supporting the safety-relevant visual tasks in the tunnel.

Current lighting concepts with disadvantages

But current lighting solutions have many drawbacks. They are usually mounted at the tunnel ceiling or high on the tunnel walls and therefore lead to complicated, lengthy and extremely expensive installation and maintenance work with prolonged closure times of the tunnel, which also leads to certain risks of accidents.

Insufficient illumination of the road makes it difficult for road users to identify the road boundaries, which increases the risk of accidents, for example because the road user keeps too much distance from the edge limit. Although the walls are partially illuminated, a "cave effect" can lead to claustrophobia and monotony, especially in longer tunnels, such as those found in the European neighbouring countries. This again significantly increases the risk of accidents.

Furthermore, the large amount of additional lights and signals for road boundary, emergency exits, escape routes, as well as other signs leads to a so-called "Christmas tree effect": too much colored light information in different places irritates the driver, his concentration

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decreases. Finally, even in the event of a fire, the lighting is permanently affected by the rising heat and black smoke, what leads in most cases to a complete lighting blackout.

Flatbeam sets new standards

In order to counteract these disadvantages in an innovative way in the future and thus contribute to a greater safety in road traffic, LMT Leuchten + Metall Technik GmbH, as a specialist for individual and project-related luminaires, developed the Flatbeam tunnel lighting system.

Consisting of a cable duct wherein luminaires, control unit boxes, cables and other required



components are installed, the Flatbeam system also scores with its excellent ergonomics for both car and truck drivers: due to the mounting height below the eye level and the illumination of both roadway and tunnel walls makes it impossible to glare road users; Glare-free and balanced luminance ratios or the distribution of low luminance values in the field of vision are particularly important for older people with increasing cloudiness of the eye lenses.

Road users also receive support for the special visual tasks in the tunnel, which is not possible with conventional tunnel luminaires. The Flatbeam luminaire also performs other functions, such as edge boundary or escape route lights, so that all important information is much better identifiable in the field of view without visually overburdening the driver. In addition to the simplified installation and maintenance, their low mounting height has the great advantage that in the event of a fire the light is not obscured by the smoke rising upwards, and thus the roadway and escape route stay always illuminated, especially in critical situations.

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Innovative technologies ensure the highest standards

The lighting concept is based on two different technologies that complement each other perfectly: an independently dimmable wallwasher, whose light colour can be individually adjusted, ensures a seamless and thus optimal illumination of the side walls; higher wall luminances, especially in the driveway area, can be realized without any problems. Added to this is the patented and glare-free Flatbeam technology, which visually emphasizes the road boundaries and thus provides visual support for the wayfinding. Edge-limiting luminaires could thus be a thing of the past in modern tunnelling.

The LED technology used with its long service life also reduces maintenance cycles per tunnel and thus significantly reduces maintenance costs per luminaire. The elimination of additional lighting fixtures also has a positive impact on operating costs and thus contributes to cost optimization.

About LMT Leuchten + Metall Technik GmbH

LMT Leuchten + Metall Technik GmbH specializes in the development and manufacturing of tailor-made solutions for lighting and metal projects. The portfolio comprises lighting tubes and luminaires for train stations, products for industrial lighting, various lighting solutions for architecture as well as housing and metal parts for medical technology, machine construction, interior works and art objects. With its LED luminaire families YECTO, LYSO, SCOPE amongst others, LMT offers ideally suited products for energy efficient external and internal illumination of public and commercial buildings, retail shops as well as residential objects.

Since its foundation in the year 1984, the company worked together with many renowned clients, architects and lighting planners and implemented countless national and international projects, including numerous train stations, as well as lighting projects such as the Museum Island in Berlin, the Airport in Frankfurt and the Kulturpalast in Dresden.

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