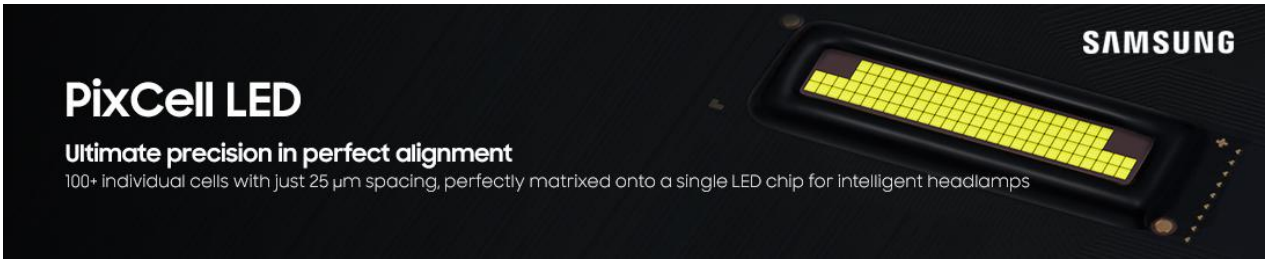
Tue, 16 August 2022
Weekly Newsletter

DVN
Lighting & ADAS

NEWSLETTER #764



Editorial

LED Substitute Bulbs To Upgrade Halogen Headlamps?

Last week, we presented the benefits of ADB for older drivers. Of course, those benefits apply only to older drivers in new cars equipped with ADB; it is not really helpful to recommend ADB to people not in a position to go buy a new car. There are still millions of vehicles on the world's roads and in the world's new-car showrooms, not only without ADB, but without LED headlamps at all. Democratising technology must extend to all drivers and all vehicles to the maximum possible degree, so what can be done?

A possible solution is LED substitute bulbs, designed to replace the halogen bulbs in existing headlamps. They have been available on the aftermarket for many years as "off-road use only" items not capable of providing legally or technically adequate safety performance. But recently, LED replacement bulbs have begun to gain legitimate potential as the involved technologies have reached the necessary developmental stages, and bona fide manufacturers have been working to develop LED bulbs as the world's technical standards bodies—GTB/GRE and SAE—have been seriously working on devising appropriate specifications for this type of product. There's Lumileds' Philips-branded product range, and Osram have been developing and marketing a range of their own, as well; at Automechanika 2022, Osram will present their Night Breaker H4 LED, which has been nominated for an Automechanika Innovation Award.

So this week, we examine the question from the first of two You'll find DVN senior advisor Ralf Schäfer's interview with Lumileds Automotive's aftermarket sales and marketing VP Vincent Ranic, who discusses his company's technical and commercial developments and successes in LED replacement bulbs. And next week, DVN chief editor Daniel Stern looks at the challenges and issues that still remain.

Of course, automakers and lighting suppliers are primarily orientated toward new-vehicle innovations like ADB and new lighting functions, and in the long term, we must do everything possible to maximise the proliferation of ADB—really, it should be mandatory! But at best that will take quite a long time, and it won't help cars already built without ADB. So we must all also, as a short-term goal, do everything we can to give drivers of non-ADB cars the best possible lighting. Perhaps good LED retrofits, made and regulated appropriately, can be a good step in that direction.

Sincerely yours

In Depth Lighting Technology

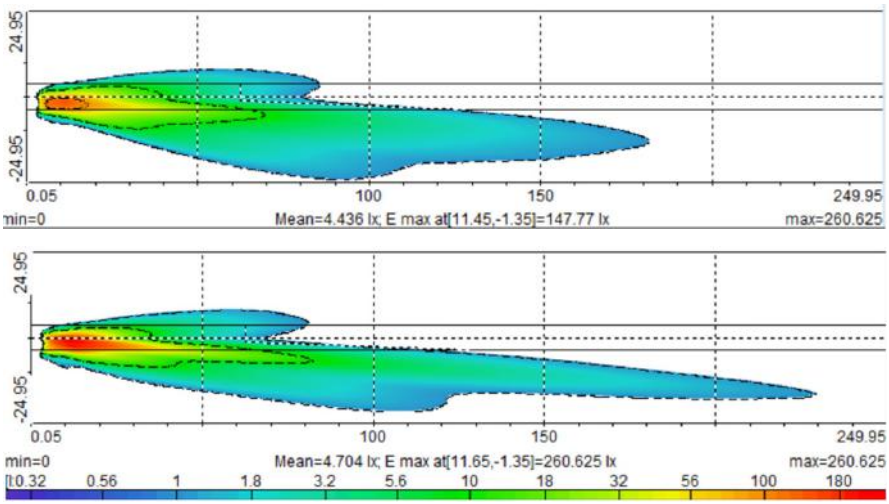
DVN Interview: Lumileds on LED Retrofit Bulbs

Ralf Schäfer is a senior advisor here at DVN now, but he was formerly R&D director at Philips Automotive Lighting. He talked with his former colleague Vincent Ranic, who is Lumileds Automotive's global aftermarket sales and marketing VP. Ranic has 18 years' experience in OE and aftermarket vehicle lighting with Philips and Lumileds, where he has held positions involving global product management, sales, and marketing. He holds an executive MBA from NEOMA Business School, and a master's in engineering sales management from Douai Business School.

DVN: LEDs have really come to dominate new-vehicle lighting, but most cars already on the road still have conventional lights. How do you look at it?

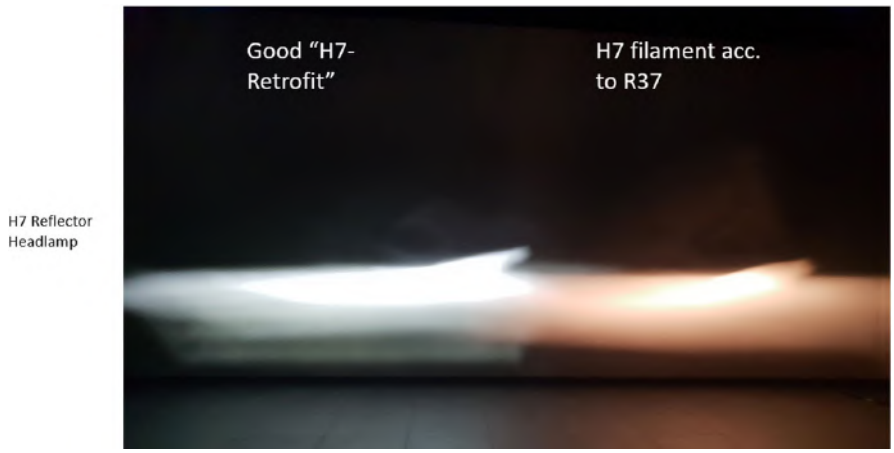
Vincent Ranic: Yes, indeed. But there is of course also the option to replace the given technology. Not just for signaling functions but also for the road illumination purposes—especially here, LED replacements can offer clear advantages. Here just a short list of the advantages of LED Light sources

- Better lighting performance—compare here halogen (top) versus LED



- Longer lifetime
- Better lumen maintenance
- Higher efficacy (lm/W)
- Light colour closer to daylight for better road vision and driving comfort

Beyond the performance and reliability benefit, end consumers value very much the LED signature of cool white light: this is a visible benefit to "upgrade" cars, and it shows!



DVN: This sounds like a clear proposition. So why don't you step forward in a broad access to market?

V.R.: Light sources on the vehicle are safety-relevant parts; therefore, the LED replacement needs to be approved following the national or international rules in the related countries. On international level this is still not completely settled down. At national level in some countries such as France and Germany national homologation is already in place.

DVN: What is the motivation of the German and French public authorities to enable the national approval of LED retrofits?

V.R.: In both countries, there is a clear understanding that end users should always benefit from state-of-the-art LED technology. Therefore, the national approval has been linked to the type approval of the headlamp and the vehicle. LED technology is today well accepted by consumers

across a wide range of replaceable light source for home, office. Therefore, the consumers' mind is ready to adopt and even expect a replacement solution for their cars. The regulatory framework is difficult to understand for end consumers: when the box in the shop or online says H7, the end consumers understand that they can replace their lamp with either a halogen or an LED replacement. In this way the car park benefits from better illumination at lower wattage without creating a safety risk.

The motivation of the German and French public authorities is therefore to set up a clear set of rules to preserve road safety and to guide consumers towards certified LED retrofits, which are the only products allowed.

DVN: How long can regulation stay behind technology evolution?

V.R.: To our view, UNECE is quite open to accept proposals based on full equivalence to former technologies, as illustrated by the fact that two types are already defined in this direction: C5W and H11. For high-power halogen replacement, including H11, this full equivalent concept would require major technology breakthrough to enable a cost-effective solution. This is not on any roadmap horizon to date, but there could be also a further option for the driver: with a further extension of the recent framework, the LED upward potential could be used to further improve illumination on the road. This would go beyond the recent conditions—an LED replacement is actually required to copy all disadvantages of elder tech: the high consumption to make it electrically compatible, and also no improvement in the light distribution allowed. LED can do more, as we can see from the experience with national approvals.

DVN: Does this limit all LED bulbs?

V.R.: This topic is far more relevant for the headlighting applications. For signaling application a full equivalence can be the proper way forward.

DVN: What are the merits and limits of LED retrofits for automakers?

V.R.: Automakers can benefit in two aspects from this development of halogen retrofits. They can implement these products in their service part offer for lighting on existing car models and thus promote safer and more sustainable, energy efficient and long lasting lighting solutions to the end consumer.
Secondly, LED retrofits can form the basis for attractive automaker equipment LED options in the A/B category of cars at a reasonable price. Although retrofits will not deliver the full benefit of LED styling features, the distinctive light colour impression can be a strong selling point to the end user. It goes without saying that OE reliability targets have to be met by retrofits under these conditions.

DVN: What are the merits & limits of LED retrofits for OEM ?

V.R.: OEMs can benefit in two aspects from this development of halogen retrofits:
Firstly, they can implement these products in their service part offer for lighting on existing car models and thus promote safer and more sustainable, energy efficient and long lasting lighting solutions to the end consumer.
Secondly, LED retrofits can form the basis for attractive OEM equipment LED options at a reasonable price uplift also in the segment of cars offering today only a basic halogen headlamp. This segment still comprises about one quarter of the OEM market. Although retrofits will not deliver the full benefit of LED styling features, the improved visibility and especially also distinctive light colour impression can be a strong selling point to the end user. It goes without saying that OEM reliability targets have to be met by retrofits under these conditions.

DVN: What is done in China with the Pre Delivery Installation (PDI) where the car has its type-approved bulbs replaced by LED retrofits before the end consumer takes delivery?

V.R.: Indeed – Chinese understand the merit of a retrofit solution without changing the reflector design. Yes they simply do. One design (headlamp) / two options for the car makers (halogen or LED): to refresh the end of life platform can be a nice carmaker option. This wouldn't even cause redesign effort to migrate to LED, and can offer upgrade benefits. Finally, the lower power consumption will help us all to bring down the CO_2 footprint.

DVN: What is needed to differentiate the good from the bad retrofits? Can this be easily differentiated? And how can it be controlled? And by whom?

V.R.: This is core of the discussion between the UNECE preparing an international regulation versus national homologations. To start answering, from back to forth. The police need to be able to control it. Therefore, an approval mark needs to be given. A UNECE regulation would then allow this—but not yet there! The national approvals therefore need to be connected to a so called "positive list" which gives the insight in approved vehicle-lamp combinations. Several countries do not have capabilities to maintain such a database, therefore UNECE wants to have a regulation based on a sort of specification: Define measurable light source parameters which safeguard the road safety. This would then be the basis for a homologation marking.

Currently, there is no realistic approval option to replace Halogen technology on an international scale. However, because of the advantages offered by LED technology, there is a strong market demand and various retrofit light sources without type-approval are offered through e-commerce or wholesalers. On the contrary, the combination of a strong market demand, the availability of non-type-approved light sources, and insufficient market surveillance leads to traffic safety risks as glare. Today's situation, in which certain market players provide non-approved, unsafe products, needs to be stopped in order to safeguard road safety. From our perspective, the regulators have responsibility to make sure all products on the market meet a minimum safety and quality standard: securing a compliant lighting performance will fulfil expectations in terms of energy savings and road safety, simultaneously.

Lighting News

VIP Keynoters and Speakers at Shanghai DVN Workshop

LIGHTING NEWS

We are proud to announce the VIPs heading the docket at the Shanghai DVN Workshop next month. Hasco Vision general manager Xuejun Qiu and GTB ex-president (and now DVN regulatory advisor) Geoff Draper will make the two keynotes at the Workshop.
Qiu will present his outlook on digital lighting driven by innovation, and Draper will describe his perspective on breaking barriers to innovation.

After the keynotes, the docket carries on with VIP speakers including Audi's head of front light development Michael Kruppa, who will discuss digital light for digital cars; Stellantis' exterior lighting innovation leader Philipp Roeckl with his presentation on driver assistance projections, and Volvo Cars' exterior lighting technical leader Paul-Henri Matha.

The Shanghai DVN Workshop will be held on 20-21 September at the Marriott Shanghai Parkview hotel. There will be presentations and discussions about road-projected light functions all around the car; illuminated logos and grilles; light signatures; decorative illumination; animation, and digitalisation.
We confirm lectures from Audi; Stellantis; Volvo Cars; PATAC; Changan; Jidu, and Great Wall; Marelli AL; Hasco; Hella; Koito; Mind; Valeo; Varroc; Xingyu, and ZKW.

The theme for the event is **Innovations for New Lighting Functions**.This rubric will be discussed during the lecture sessions by top worldwide experts to help you orient strategic decisions for your

company and yourself concerning your product, service roadmaps, resource investments and allocations. This event brings the opportunity to network with international and Chinese colleagues and innovators and to promote your lighting products and services towards the highest-relevance portions of the world's markets. If you haven't yet signed up, visit the **Shanghai Workshop page** and scroll down to find the Register Online button. We look forward to seeing you there!

NHTSA, Briefly Steered, Is Now Leaderless Again

LIGHTING NEWS

Just two months ago, we **reported** that NHTSA, the US National Highway Traffic Safety Administration, had finally got its first congressionally-confirmed administrator since 2016: one Steven Cliff. If you blinked or sneezed, though, you might have missed him. Cliff resigned last week to take a top job at the California Air Resources Board, responsible for pollution-related regulations throughout the state of California. His departure leaves NHTSA under the control of an agency lawyer.

NHTSA declined to share details about the circumstances of Cliff's departure. In his resignation statement, Cliff thanked President Biden and Transportation Secretary Pete Buttigieg for trusting him to lead NHTSA, saying "It has been my honour to have the opportunity to work alongside an extraordinary team of professionals on a series of measures that will make vehicles more fuel efficient and safer for all Americans". Secretary Buttigieg thanked Cliff "for his tremendous service at NHTSA and his work to protect the lives of the American people by strengthening the safety of motor vehicles and reducing their emissions. We are grateful for his leadership and know that the residents of his home state will be fortunate to have him as the executive officer of the California Clean Air Resources Board [sic]. We are delighted that NHTSA's chief counsel, Ann Carlson, has agreed to take on Steve's duties when he departs and know that the agency will be in very good hands thanks to Ann and the rest of the dedicated and talented team at NHTSA".

Stern's comment: Some things happened at NHTSA during Cliff's brief tenure, but given NHTSA's notoriously—and **repeatedly officially noted**—slow and doddering pace of achievement, any such things surely all got started long ago. So it is difficult to imagine just what work, exactly, Cliff refers to in his couple of months at NHTSA. Likewise, it's hard to picture the 'tremendous service' Buttigieg thanks him for. Those two difficulties are eclipsed by the incomprehensible spectacle of the world's second-largest auto market's dysfunctional vehicle safety agency now once again being without intentional, deliberate leadership.

Hella's First Lit Grille Emblem

LIGHTING NEWS

Frontal design is central to a vehicle's recognisability, and Hella are now offering vehicle manufacturers illuminated logos to help create what the supplier calls "distinctive brand presence". The use of a wide variety of optical systems for direct and indirect lighting opens up new design possibilities for an extraordinary design.

To give the radiator grille an attractive, exclusive day and night appearance, Hella use a variety of manufacturing processes and technologies, such as laser structuring and film back injection, to produce highly decorative components presenting the automaker's desired look. When switched on, the logos are illuminated and defined structures become visible. Welcome and farewell light scenarios are also conceivable. Even with constraints imposed by the relevant regulations—such as the UN Regulations which will allow illuminated logos starting next year—a wide array of design options can be provided. Different model variants, for example, can be readily differentiated by simply adapting the design or styling of the surface.

Instrument Systems Buy Their Korean Distributor

LIGHTING NEWS

Instrument Systems, in an effort to extend their core activity of display testing and optical measurement, have agreed to acquire one hundred percent of Kimsoptec, a 43-employee display measurement equipment manufacturer and exclusive distributor of the Instrument Systems product portfolio in Korea since 2005.

Following their priority areas—fast and accurate inspection of ICT displays in production lines and R&D—Instrument Systems have been looking to expand their business activities to include new light and display measurement applications. Now the company have achieved a successful entry into the field of optical inspection of sensors for identity authentication, which is becoming increasingly important in ICT devices, including in the automotive sector.

As a second field, Instrument Systems aim to expand their market segment focused on the inspection of AR VR displays. This field is expected to grow in the Korean market due to upcoming activities of all major ICT companies, generating an increasing demand from Asian manufacturers within the supply chains.

Marelli Finish Final Legal Steps of Revitalisation Plan

LIGHTING NEWS

Marelli Holdings announced they have obtained the final legal effectuation of their revitalisation plan. With this, the company's capital restructuring and simplified rehabilitation proceedings have successfully concluded.

Central to the plan is Marelli's capital restructuring, comprising the investment of new equity capital by shareholder KKR, which will imminently be made available, and a reduction of existing bank debt, which is legally binding for all involved bank lenders. This provides the company with the financial stability needed for development and growth.

Driver Assistance News

MRSI Collaborate with Lumentum on Lidar

DRIVER ASSISTANCE NEWS

MRSI Systems, a Mycronic Group company, will cooperate with Lumentum Operations, a leading global photonic chip and module supplier for the automotive lidar industry, to generate innovative lidar solutions.

Based on their expertise in reliable diode laser solutions for communication and consumer applications, Lumentum have developed a series of diode laser products that meet the quality, scope, and reliability requirements of the automotive industry. Lumentum provide 1,550-nm, narrow-linewidth DBR diode lasers for FMCW (frequency-modulated continuous wave) coherent lidars; and 905- and 940-nm VCSEL array lasers with corresponding power for long-distance lidar and in-cabin monitoring.

MRSI's collaboration with Lumentum is intended to provide high-reliability photonic chip assembly solutions and services for the automotive lidar industry. "Reliability is critical for automotive lidar applications and both the laser chip and the module assembly technology are essential to passing the strict reliability requirements for vehicles," said Mr. Lu Yong, Senior Product Line Manager of Lumentum. "Our combined efforts will better support customers with a complete solution that includes high-reliability laser chip and assembly products."

MRSI Systems are a global supplier of fully-automated, high-accuracy die bonders, providing high-precision, high-flexibility, high-reliability, and high-speed fully automatic chip assembling solutions for the optoelectronic and microelectronic industries. In the automotive lidar industry, MRSI provide high reliability and fully automated assembling solutions for different die bonding processes.

New Xpeng-Alibaba Computing Centre

DRIVER ASSISTANCE NEWS

Chinese automaker Xpeng have chosen Alibaba's cloud division to meet some of their IT needs, and now the two companies are opening a new computing centre in the Inner Mongolian region in northern China, to train Xpeng's.

Autonomous driving systems require the processing of large amounts of data to train the algorithms, and the infrastructure needed to process them must be robust and powerful enough. Xpeng say the facility will cut the training time for their core self-driving model from seven days to less than an hour.

E-commerce giant Alibaba first invested in Xpeng in 2018. This latest deal fits into Alibaba's strategy to bolster their cloud computing division as their core e-commerce business slows in China.

The ADAS embedded in Xpeng vehicles is called XPilot. Drivers who buy this option can benefit from features like automatic lane change. Last year, Xpeng launched the City NGP system, with features that allow cars to change lanes; speed up and slow down; overtake; enter and exit freeways.

Microvision Test Car Shows Mavin Lidar, Sensor Fusion Prowess

DRIVER ASSISTANCE NEWS

MicroVision have unveiled their new dynamic view lidar system, called MicroVision Mavin™ DR, to enable new ADAS safety features addressing the need to see further, with greater clarity, and respond faster to emerging situations.

Mavin DR is the 4th lidar hardware variant from MicroVision, and the first to combine short-, medium-, and long-range sensing and fields of view. The new sensor produces an ultra-high-resolution point cloud showing drivable and non-drivable areas of the road ahead. With its low latency (30Hz), the Mavin product line allows ADAS to respond more quickly and take action at high speeds.

In addition to the dynamic view system, the Mavin DR has a new hardware form factor that complements automaker designs and enables more flexible deployment options. Built with materials already known to automaker supply chains, MicroVision hardware is scalable, sourceable, and supports a lower cost structure.

MicroVision are a pioneering company in MEMS-based laser beam scanning technology that integrates MEMS, lasers, optics, hardware, algorithms, and machine learning software to address existing and emerging markets. The Company's integrated approach uses proprietary technology today to develop automotive lidar sensors and provide solutions for ADAS, leveraging their experience in augmented reality micro-display engines, interactive display modules, and consumer lidar modules.

Sick to Bring Aeva 4D Lidar to Industrial Sensing

DRIVER ASSISTANCE NEWS

Sick provide sensor intelligence and application solutions for controlling processes securely and efficiently, protecting individuals from accidents, and preventing damage to the environment. Now they've partnered with lidar provider Aeva to bring FMCW (frequency-modulated continuous wave) lidar to industrial sensing applications.

Aeva's Aeries II lidar module, shown here, has a sensing range of up to 500 metres, and can measure velocity for each pixel. The FMCW lidar technology is fabricated on a silicon photonics platform and integrates all components on a single chip.

Dr Niels Syassen, member of the executive board responsible for technology and digitisation at Sick, says "We are convinced that Aeva's unique approach to FMCW technology will provide new opportunities for us and our customers in a variety of industrial sensing applications where traditional time-of-flight lidar technologies are challenged".

Aeva's FMCW 4D lidar technology provides excellent dynamic range for operating outdoors. The device is also immune to blooming and ghosting from retroreflectors, such as safety vests, cones and tape.

General News

Launch of Long-Anticipated Cybertruck Mid-2023

GENERAL NEWS

CYBERTRUCK

Tesla CEO Elon Musk says the Cybertruck, with its angular, squared-off design, will be built at the Tesla Gigafactory in Austin, TX, as originally announced back in 2019.
The timetable has been pushed and pulled, but Tesla CEO Elon Musk says the long-awaited Cybertruck will be ready for sale by the middle of 2023.

“The specifications and price will be different,” Musk now says, noting no one was predicting the bout of inflation that has gripped the global economy in the wake of the COVID-19 pandemic.

Musk, however, emphasizes the Cybertruck, with its angular, squared-off design, will be built at the Tesla Gigafactory in Austin as originally announced back in 2019. “It’s one helluva product,” he says. “It will be a great product. “The truck is going to be produced from this factory in the middle of next year,” says Musk. “You will see us installing production machinery in the next few months.”

Musk, however, notes Tesla has grown steadily since 2012 when it produced fewer than 3,000 vehicles. Tesla expects to build 1.5 million vehicles this year and exit 2022 with a “run rate” of 2 million vehicles annually as it continues to ramp up production at the company’s new factories in Austin and Berlin. Musk says Tesla could announce the site of the next Gigafactory later this year.