

Tue, 10 May 2022
Weekly Newsletter



NEWSLETTER #750

PixCell LED

Ultimate precision in perfect alignment

100+ individual cells with just 25 µm spacing, perfectly matrixed onto a single LED chip for intelligent headlamps



Editorial

Tier-2s Pave The Way For Lighting Innovation

Welcome to your weekly DVN newsletter!

This week, we bring you an interview with Dow's global mobility and transport marketing director. Read it and see how deeply a tier-2 supplier—a material maker, in this case—is involved with innovations like ADB, for example, providing optical-grade silicones for moulding into complex primary optics. And that's just one example of one kind of part; there are many more!

There are many other tier-2 suppliers, too, of course, throughout the vehicle lighting ecosystem: light sources; optics; electronics; thermics; simulations, and now software, for a partial list, and they all pave the way for innovations to reach buyers and users. They all have crucial roles to play, next month's DVN Workshop in Michigan will include two sessions dedicated to light sources and two sessions for other tier-2 suppliers.

This week, we publish the flyer concerning the [DVN workshop in Rochester](#), Mi., on 20-21 June.

Among the 30 Lectures, contributions are confirmed from OEMs Audi, Lucid, Rivian, Stellantis, Volvo, from lighting suppliers Hella, Marelli, Mind, Mobis, Valeo, from regulators from GTB, SAE, OEMs, and of course from Tiers 2.

Wolfgang Huhn, former lighting chief at Audi and now Senior Adviser at DVN will open the workshop.

This week, we also publish an interesting [report](#) on car models released since January months, with five main takeaways: thin headlamps; full-width front and rear lights; rear lights as displays; extended grilles, and front and rear lights using the same design for coordinated appearance.

In total, a lot of information!

A handwritten signature in black ink, appearing to read 'W. Frally'. Below the signature, the text 'DVN CEO' is printed in a small, sans-serif font.

In Depth Lighting Technology

DVN Interview: Dow's Innovative Materials for ADB and Thermal management



Jeroen Bello is Dow Consumer Solutions' global marketing director for mobility and transport. He oversees Dow's portfolio of engineered materials and silicone elastomers for mobility and transport applications with focus on e-mobility; autonomous vehicles; safety; connectivity; lightweighting, and comfort. Bello has held numerous commercial and business leadership roles in Europe over his 11-year career with Dow, including new technology senior marketing manager, automotive strategic marketing director, and innovation leader.

DVN: Tell us about yourself and your company, will you?

Jeroen Bello: Our ambition is to become the most innovative, customer-centric, inclusive, and sustainable materials science company in the world. To reach this goal, we combine global breadth; asset integration and scale; focused innovation and materials science expertise; collaboration with other key market players; and environmental, social and governance leadership. These attributes enable Dow to achieve profitable growth and deliver a more sustainable future. Our portfolio of plastics, industrial intermediates, coatings and silicones comprises a broad range of differentiated solutions. They benefit customers in high-growth market segments, such as packaging, infrastructure, mobility and consumer products. Dow operates 104 manufacturing sites in 31 countries and employs more than 35,700 people. The company had sales of USD \$55bn in 2021.

DVN: What key applications do you focus on, and what can you tell us about optical silicone?

J.B.: Our primary application is advanced adaptive driving beam (ADB) lighting solutions for enhanced vehicle safety. We provide optical-grade silicone materials to be molded into complex matrix lenses with up to 84 light guides connected to LEDs.



Our optical grade silicones are used primarily in exterior applications, but can also be used in interiors to suppress buzz-squeak-rattle. We have approvals from global automakers, and are engaging with partners to develop new ADB solutions in North America, now that the National Highway Traffic Safety Administration has authorized them.

DVN: Whom do you sell to?

J.B.: Dow operate across the automotive value chain, working with many global automakers and all major tier-1 suppliers. We also work upstream with tier-2 and -3 suppliers ranging from component and module manufacturers to optical lens molders and compounders. In vehicle lighting, we connect with key players through our work with automakers. In 2020 we launched our Dow MobilityScience™ platform, which focuses on material science capabilities, innovation and services for automotive and the broader transport sector. This platform encompasses differentiated materials, including polyurethanes, acrylics, silicones and specialty chemicals, as well as extensive services for customers.



DVN: Which is your most-requested vehicle lighting product now? How do you think that answer might shift in the foreseeable future?

J.B.: Since 2014, Dow Silastic™ MS-1002 mouldable silicone has been our top product for vehicle lighting. It is a proven solution that has been used in four million vehicles to date. Interest from customers is high and is expected to remain strong in the future. In addition, we continue to expand our portfolio of mouldable silicones to address specific customer needs. We will launch MS-5002 mouldable silicone in mid-2022 to

offer customers a product that features high productivity, enhanced sustainability and reduced maintenance. This new liquid silicone rubber (LSR) targets light guides for ADB headlamps, and sets a new standard for mould-fouling reduction. It enables lighting manufacturers to quadruple in the number of injection moulding cycles between mould cleanings, helping to boost productivity significantly. Reduced mould fouling also helps maintain high optical quality by avoiding surface degradation of the silicone part. This new injection-moulding material offers greater freedom to design the next generation of ADB lenses with innovative light guide shapes and variable wall thicknesses. It delivers excellent optical performance under long-term exposure to high heat and high photon density to maintain high light transmission over the life of the ADB headlamp, and to meet global automotive requirements. And its stable pot life contributes to ease of moldability.

DVN: Interesting! What else does this new material offer?

J.B.: Our new Silastic™ MS-5002 moldable silicone offers a wide array of advantages over traditional glass and plastics:

- High productivity: low mould fouling avoids downtime and places less stress on mold tools. In addition, no secondary polishing is required.
- Lightweighting: liquid silicone rubber is lighter than glass and other optical materials.
- High optical quality: the product offers high transparency and non-yellowing.
- Sustainability: faster throughput reduces energy consumption during processing.
- Aesthetics: the material resists scratches and cracking.
- Good heat stability: this allows close proximity to high-power LEDs.
- High performance: the material's excellent physical and optical properties withstand harsh environmental factors including temperature extremes, high relative humidity, and UV exposure, alone or in combination.

DVN: What do you offer for energy savings in vehicle lighting?

J.B.: Sustainability drives all our innovation efforts, and we approach it holistically, along the entire vehicle lifecycle. At each stage there are opportunities to enhance sustainability. For instance, during the design phase we work with lighting customers to identify optical silicones that can replace heavier materials like glass. For production, we focus on materials like Silastic™ MS-5002 that accelerate throughput to cut energy consumption and avoid resource-intensive secondary operations like polishing. To extend useful life during operation, we work to match material properties with environmental and other exposures.

DVN: Do you provide thermal-management materials, too?

J.B.: Yes, Dow have a series of thermal interface materials (TIM) that are used in LED lighting. They efficiently manage heat transfer from the LED printed circuit board to the heatsink. Thermal management is critical to protecting and extending the lifespan of electronics. Dow offers many heat management options.



Dow's TIM portfolio consists of thermal adhesives and dispensable thermal pads. Thermal adhesives form thermally stable bonds to most LED PCB substrates and deliver excellent thermal conductivity. Their low volatility means no adverse impact on components or light output. Dispensable thermal pads allow quick and precise printing of thermally-conductive silicone pads in controllable thickness on complex substrate shapes. They offer enhanced thermal performance and can accelerate production and, in many cases, reduce system costs. Dow have worked extensively on encapsulants and potting compounds for advanced driver assistance systems. In addition, we are now developing more electrically-conductive adhesives. We realized that emerging autonomous vehicles will require solutions that prevent crosstalk and electromagnetic interference among multiple ADAS sensors. Interest in our solutions is picking up steam as more ADAS technologies are implemented by automakers. As vehicle electrification advances and adoption of 5G technologies expands, it will become increasingly important for radar, lidar, and cameras to work reliably and accurately. Our materials offering thermal and electrical conductivity can help ensure vehicle safety systems will protect us, the roads, and our journeys.

DVN: What new optically-transparent materials for lenses can you tell us about?

J.B.: The whole series of Dow Silastic mouldable silicones for design and fabrication of silicone optics can encourage innovation in vehicle lighting applications. These materials feature various mechanical and optical characteristics to meet different design, production and usage requirements.

Lighting News

DVN Interview: Hasco Supporter on High-Tech Lights

LIGHTING NEWS



Two weeks ago, DVN made a paper on the Hiper HX, presenting the spectacular lighting system as developed by Chinese Supplier Hasco Vision in only nine months. We asked a few questions to Shaoyuan Zhang, a supporter at Hasco.

DVN: About ADB, which technologies will be dominating in the next five years?

Shaoyuan Zhang: Matrix technology is still the mainstream, but high-resolution ADB technologies, such as HD and DMD, will also account for 10 per cent of ADB applications. And for sure the new EV carmakers from China will be much faster to use the new technologies.

DVN: For front lighting, which main trends for style or marketing do you see and how must technology evolve to prepare?

S.Z.: The development trend of headlamp lighting application will continue to focus on extremely narrow lighting technology and distributed module technology. This modeling trend will become more and more common. The other direction is the pixelation and graphics of signal lights. Whether in the application of welcome, personalisation, or information interaction, this will gradually become popular.

DVN: What do you think about new uses of light like road projection and communication with other road users and pedestrians?

S.Z.: This technology is very helpful in some scenes and has direct significance to improve driving safety, such as lane change warning, pedestrian warning, etc. in this scene, the light is very effective as a tool for the vehicle to convey its intention. Many customers are consulting different forms of projection interaction technology, such as vehicle side, and even color technical solutions, which are not only applied as part of the headlamp. Especially in China, the customer wish to make their cars different, each

cent the customer paid for the car should be “seen”. Projection is also a very important feature for marketing.

DVN: The lighting system for the HiPhi X was developed in just nine months. How was it possible to reduce the development time to less than half the usual?

S.Z.: In fact, the accumulation of core technologies, such as DLP headlamp module and graphical control module, was completed in the early stage. And an important feature is that the development of the system adopts the concept of hardware embedding and software iteration. After the model is launched, it has been optimized and updated three times through OTA.

Main Takeaways Vehicles Launched from January 2022

LIGHTING NEWS



Thin headlamps



ACURA INTEGRA



AUDI A6 AVANT E-TRON CONCEPT



BMW X7



BMW 7-SERIES



CHRYSLER AIRFLOW GRAPHITE



BUICK GL8 FLAGSHIP

Rear light side to side



MERCEDES-BENZ EQXX CONCEPT.



POLESTAR O2 CONCEPT



SMART 1

Front light side to side



GENESIS X SPEEDIUM COUPE CONCEPT

Extended Grill



AUDI URBAN SPHERE CONCEPT



ŠKODA ENYAQ COUPE IV



BUICK GL8 FLAGSHIP CONCEPT

Rear light as Display



AUDI A6 AVANT E-TRON CONCEPT



AUDI URBAN SPHERE CONCEPT

Tata Curv Concept: Side to Side Light in Front and Rear

LIGHTING NEWS



Defining a new era of SUV design, Tata Motors showcased its Electric SUV Concept - CURVV.

The headlights are composed of a full width stripe with 'J' at the end, defined by geometric lines.

DLR's are integrated in the lower of the bumper, composed of a 3 triangle pattern.



The rear lights are following the same theme as the front with a full width stripe and pattern



BMW M4 CSL G82 Bears New Lights

LIGHTING NEWS



The new BMW M4 CSL will be fully unveiled at the end of this month. What's known already about the lighting: it's got yellow DRLs—at least in North America where that's allowed; most of the rest of the world requires all DRLs to be white.

And the new taillights, with their ultra-fine lines, differ sharply from those on the regular M4. We look forward to seeing and reporting on the full lighting system of this exciting special-edition Bimmer once it's revealed!

Driver Assistance News

Innoviz Claim Big Supply Contract

DRIVER ASSISTANCE NEWS



Innoviz say they've landed a USD \$4bn supply contract, for their lidar to be installed across multiple brands offered by a global automaker, but the Israel-based supplier aren't saying which—at least not yet; they're saying there'll be more news during an earnings call with market analysts soon, so watch for our continued coverage.

The contract, as described, pumps the company's order book to \$6bn. CEO and cofounder Omer Keilaf says "Being selected by another multi-brand global vehicle maker is a significant catalyst for Innoviz. We are expecting the scope of this deal to grow even further, as additional car brands within the group decide to adopt our platform".

Innoviz have been working with BMW since 2018, and their InnovizOne lidar is to be used in the BMW iNext vehicle range. The sensor will be manufactured by Magna, who are also an Innoviz investor.

Innoviz also are in development with Aptiv and Samsung.

Lumentum Chief Optimistic Despite Challenges, Setbacks

DRIVER ASSISTANCE NEWS



Lumentum have reported quarterly sales of USD \$395m for the three months ending this past April 2, down 6 per cent year-on-year despite stronger underlying demand for virtually all of the firm's products. That demand was evident in the figures for Lumentum's commercial lasers business unit, which sells sources used in materials processing and other industrial applications.

Thanks largely to demand for high-power fibre lasers, the division posted quarterly revenues of \$51m, up more than 60 per cent versus the same period in 2021.

Reflecting on those results, Lumentum CEO Alan Lowe said "Demand for our products continues to accelerate, and we now expect demand to outpace component supplies by more than \$100m in Q2.

Lowe said shortages of PCBs and other basic components will likely continue for the rest of this year:

"Though component supply is increasing, demand is growing even faster. While we expect these supply shortages to continue to improve with the diligent work of our team and our suppliers, given the accelerating demand environment, we will likely see customer demand outpacing third-party material supply into calendar 2023".

As to 3D sensing and lidar applications, Lowe said Lumentum have expanded their development activities in the areas of extended reality and automotive lidar, with production of multi-junction VCSELs now ramping up: "New automotive customers are turning to our lasers for lidar, and we are engaged with more customers on extended reality applications". Lowe also described his company as having what he calls "early product traction" with multiple customers currently developing XR products that are expected to hit the market next year.