



WE BRING
LIGHT
TO LIFE


LIGHTING CONSULTANTS

ALAC
systems

INTERIOR
LIGHTING SYSTEMS
Analysis. Development. Manufacturing.

LIGHTING HARMONY

Perfect lighting creates perfect mood

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Various lighting types: Ambient. Contour. Function. Dynamic.	Page 6 - 7
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”Interior lighting is evolving into a complete lighting system. When implemented with lighting harmony at the forefront you will enhance your vehicles. We consider this along with ergonomic factors and vehicle choreography - delivering a solution that provides you with the competitive advantage.

Chris Eardley
Managing Director, The Lighting Consultants



FROM A
**SINGLE
SOURCE**

Lightguides. Electronics.
Connectors. Wire Harnesses.

Adaptable experts at the forefront of lighting technology, making your concepts a reality

The Lighting Consultants have over 15 years of experience forged in the automotive industry – with a focus on Interior Lighting: ambient, contour/signature & dynamic lighting solutions. We are extremely passionate about innovative solutions and we endeavour to push all technological and manufacturing boundaries to remain at the forefront of the interior lighting sector and provide you with the competitive edge.

We began our journey as consultants, progressed to the supply of prototypes and we have now moved on to low-mid volume manufactured solutions.

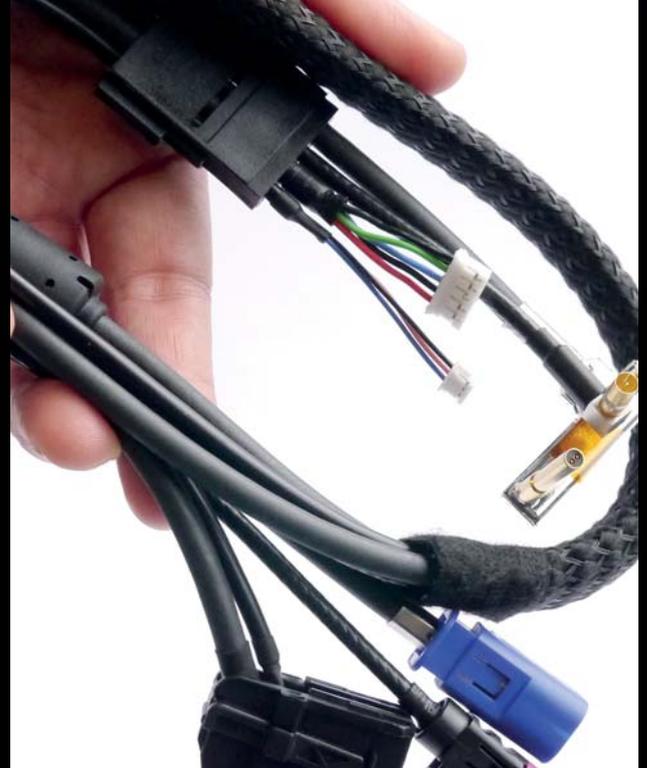
2017 brings us to manufacturing lighting solutions for three major OEM's. All of our products are 100% tested and we aim to develop lighting solutions that are right the first time they are manufactured. With the ability to provide the best in quality prototypes, we use these to validate each design.

Believing in the importance of continual improvement and a deep commitment to quality, we are ISO9001:2008 approved since 2015, our TS16949 is in process with the aim to achieve this accreditation by november 2017.

The Automotive industry has the technological lead for interior lighting today. Our work here translates to a multitude of applications and we are keen to share our knowledge with other industries.

” *We are not just another lighting analyst. We realise your projects from the concept to series production – this gives you security for each process step.*

Kay Naber
CEO, ALACsystems



Photons and Electrons in harmony - ALACsystems partnership

After working with ALACsystems for several years, we are excited to announce an official partnership in 2017. Our specialities of contour and ambient lighting alongside their capabilities of electronic hardware and software development as well as wire harnesses and customized connectors deliver complete lighting packages to automobile manufacturers in the UK and throughout Europe.

ALACsystems is a specialist in the field of electronic components and tailored connectivity solutions in automobiles for more than 24 years.

The comprehensive expertise from development and production as well as the experience from intense and long-term cooperation with Tier 1 and Tier 2 suppliers of the automotive industry make ALACsystems the ideal partner for your projects. The wide range of services covers all processes from analysis and development to project management and series production.

This partnership enables us to provide a single source for clients to achieve robust products for design and manufacturing of lighting systems including complex electronics, harness and connector supply, without having to rely on multiple vendors.

We recently introduced an aligned milestone gate process to optimise project productivity to further support our customers.





DESIGN COMFORT FUNCTIONALITY

Selection of the various lighting types we cover and some of their applications

Want to enter tool kick off with more confidence? Cutting edge simulation software combined with our talented engineers that know how to drive it, makes *The Lighting Consultants* the obvious choice. We thrive on finding innovative design solutions even within the tightest of package spaces.

Ambient

- | Door trims
- | Centre console / IP
- | Foot well
- | Roof lining
- | Stowage bins
- | Glove compartment

Contour

- | Door trims
- | Centre console / IP
- | Speaker trims
- | Cup holders
- | Ventilation elements
- | Control switches / handles

Function

- | Stowage bins
- | OHC (Overhead consoles)
- | Reading lights
- | Spot lights
- | Luggage illumination
- | PRNDL Indicator

Dynamic lighting

Discover new opportunities of dynamic effects for ambient-, contour- and functional lighting.



Colour change

Different gradients

Sequential indications

Contour light: Door handle

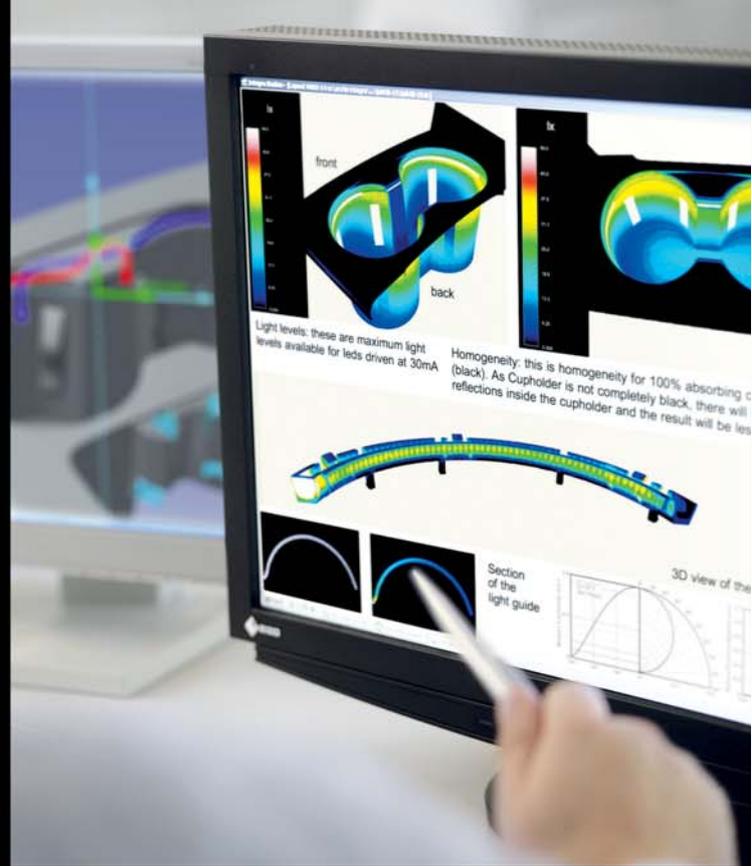


Ambient light: Cup holder, Centre console

FROM CONCEPT TO REALITY

Efficient state-of-the-art technologies –
of course with certification

Our efficient teams in analysis, development, manufacturing and quality are there to ensure successful realisation of customised product and process solutions of our lighting modules.



Analysis

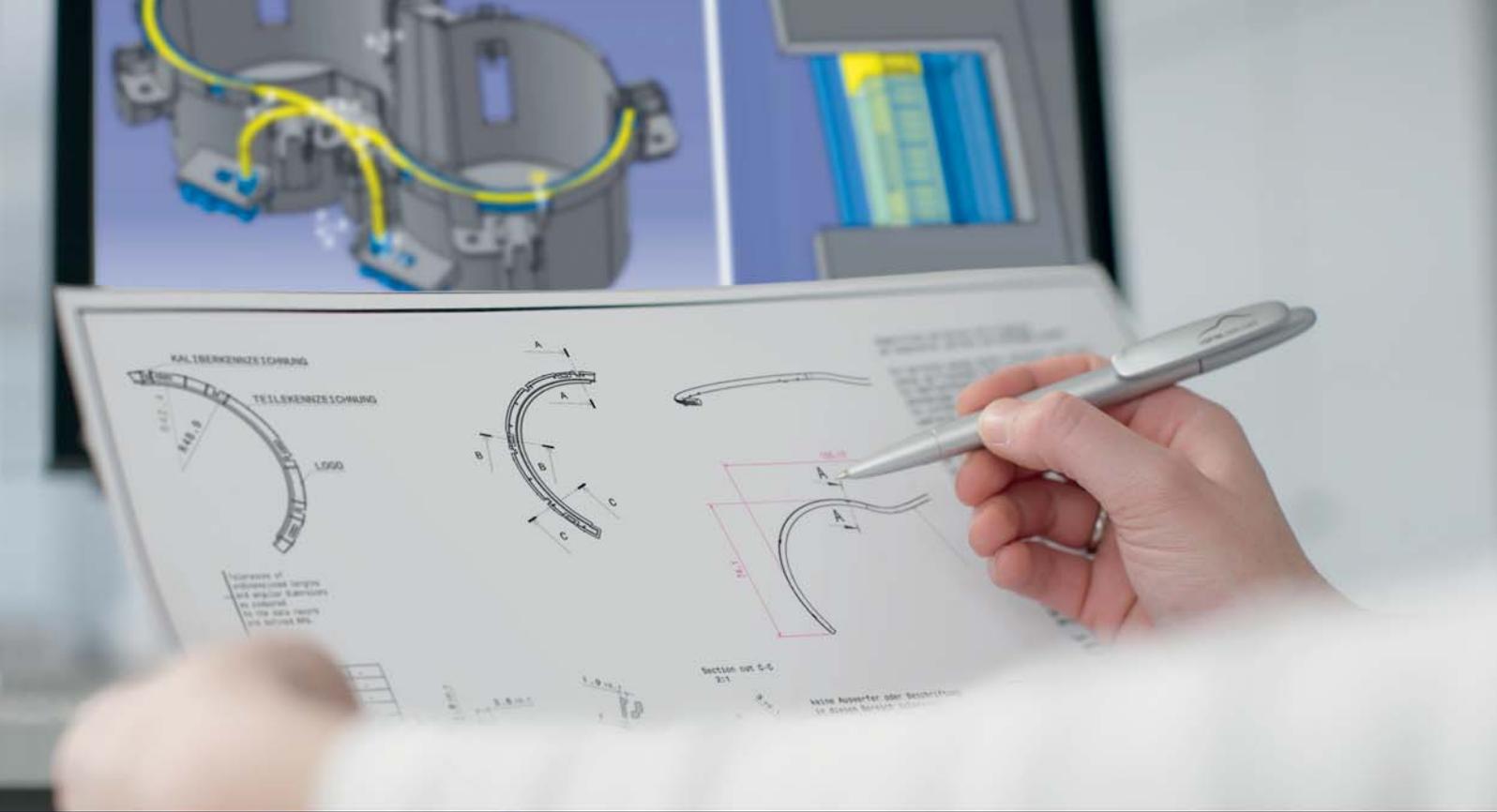
Working in the CAD environment our software is the top lighting software in the industry and the results are incredibly accurate.

We simulate all our design solutions in the assembled location and always consider the ergonomic factor, the material types and of course the light source.

Light is design and we always consider what is visible when approaching or leaving the vehicle, most of all, how is it observed in the peripheral vision. If there are other light sources on the same system, we will ensure you attain a lighting harmony by calculating the specific resistor values for each lighting module.

When our designs are complete and manufactured, we then use our light measurement devices to validate the lighting results measuring the Lux / Cd/m² and Colour.

- | Evaluation/verification of the lighting design
- | Design space examination
- | Light simulation
- | Design strategy
- | Evaluation of the design for manufacturability (DFM)
- | Realisation in due time and with regard to legal requirements



Ambient light: Cup holder

Development

Providing detailed engineered solutions ready for manufacturing. Attention to detail is key in the development of any product and we will consider the whole spectrum of tasks to ensure our clients receive a robust engineered solution.

When developing any components DFM (Design for Manufacturing) is always a priority. Optical and Mechanical development work closely together to attain a feasible lighting solution that is ready for manufacturing, all tool features will be agreed with the manufacturer and released under our tool release gateway.

A functional prototype is made to ensure the results prior to commencing with manufacturing.

- | Visual design
colour, light, symbols, ergonomY
- | Electronic system
- | Mechanics
- | Material selection
LED selection, design of optical fibres
- | Prototyping
- | Simulation
beam tracking, colour matching,
brightness distribution, homogeneity
- | Validation



Ambient light: McLaren 720S



Luggage lamp, own design

Current setup is one side mounted lamp with two LEDs active



Improved setup demonstrating homogeneous illumination



Qualification

Our quality management system is oriented on the one hand on national and international standards as well as on the highest demands of the automotive industry.

Possible causes for defects in the later production stage will be almost excluded already during the development of tools and production lines.

The entire process monitoring is based on Advanced Product Quality Planning (APQP), including the documentations DFMEA, PFMEA, SPC, MSA and PPAP. For us however, quality management also means to organise operational sequences, continuous optimisation and thus the ability to offer high-quality finished products.

- | X-ray system for analysis of crimp connections, connector systems and electronic components
- | Measuring instruments for pull-off force
- | Vibration and shock tests
- | Climate chambers for environment and lifecycle testing
- | Contact durability test devices
- | Light measurements
- | Complete validation according to OEM/customer specifications

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