Automotive Front Lighting

Roadmap GTB Front Lighting WG

Chairman: Dr. Rainer Neumann
Secretary: Jean-Marc Prigent
Automotive Front-Lighting

Agenda

Future Trends
Future Needs
Short Term Actions
Summary & Outlook
Front Lighting Technology Market Demands

**Value**
- Increased Safety and Convenience
- Improved Lighting Performance
- Added Functionality
- Brand Differentiation

**Driver Assistance Systems**
- Adaptive LED Lighting
- Path Prediction
- Car to Car Communication

**LED Light Source Modules**
- Standard

**Year of Availability**
- 2012+

**Added Functionality, Full Lighting Systems**
- Improved Performance/Safety
- Automatic Levelling

**Improved Styling, Performance, Functionality**
- Reduced Package
- Reduced Weight
- Headlamp Cleaning

**Full Adaptive Lighting**
- Bi-Functional HID with LED indicator lips

**Halogen AFS**
- Bi-HID AFS
- Dual Projector

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- Halogen AFS
- Bi-HID AFS
- Dual Projector
• HID 25W SYSTEMS
Future Trends

- Green Car Initiative (Electrical / Hybrid vehicles) requires:
  - Power Consumption Reduction
  - Fuel Consumption Reduction
  - CO2 Reduction
  - Weight Reduction
  - Long Life Time

Attractive Styling
Adaptive Driving Beam

Multifunctional HID unit driven by camera
Future Needs

- There are two main categories, which we do have to cover from legislation point of view

1) Harmonization of legislation with all kind of light sources (Halogen, Xenon, LED) and all kind of light applications standard dipped/main beam, AFS, LED-array generated or micro-mirror variation of light distributions

2) Driver assistance lighting systems with external parameter variation of light pattern (e.g. Adaptive Driving Beam, Predictive AFS, Car to Car Communication)
Short Term Actions

Glare
• Automatic Levelling
• Headlamp Cleaning
• 2000 lm criterion

Literature Study (organized by SVP group)
Updated evaluation of glare for road users
With respect to spectral distribution of light source
Automatic Levelling and Risks of Glare by Dipped Beam Light Distribution
Glare and Headlamp Levelling

Different effects and tolerances in „real life“, which lead to glare or decreased range of headlamp light distributions:

- **horizontal & vertical adjustment process**
  (EOL, garage)

- **Variation of load**
  in passenger compartment, trunk, gasoline

- **Dynamic Vehicle Movement**: acceleration and braking

- **Geometry**:
  Road curvature, driver’s eye position
  Slopes and hills, bends, SUVs, trucks, etc.

Automatic Levelling
Actions on Glare Study

- Evaluation on spectral distribution influence on disability glare
- (difference between Halogen, Xenon, LED)
- Definition of criteria to rate glare effects
- Classification of the importance of glare caused by levelling device
- Effect of discomfort glare

(Research study is going to start at University Darmstadt, Germany)
Headlamp Cleaning

- First study was presented by University Darmstadt, Germany:

- Empirical tests have been made on the glare effect with respect to headlamp cleaning devices

- First results indicate, that the effectiveness of headlamp cleaning devices is not that high

- Further studies are ongoing
Thanks for Your Attention!