LED Retrofit Lamps as replacement for incandescent lamps
Update / extension of UN ECE rules

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Statistics

- 15.5% of all cars have one or more lamp defects.
- Even 13.1% of cars with lamp diagnostic systems have one or more lamp defects.
- 70% to 87% of all car head lights in Germany are equipped with incandescent lamps.

- The risk for a deadly injury by a traffic accident is 3 times higher at night than at daylight. (Source: DESTATIS)
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Disadvantages of incandescent lamps

- Incandescent filament lamps are sensitive to
  - Voltage fluctuations
  - Vibrations
  - Shock forces
  - Life time requirements

- Common harmful factors to incandescent lamps in vehicles are
  - Voltage fluctuations
  - Vibrations
  - Shock forces
  - Life time requirements

H7 Halogen incandescent filament lamp
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Advantages of LED lamps

- LED lamps are proof of
  - Voltage fluctuations
  - Vibrations
  - Shock forces
  - Life time requirements

- Further advantages of LED lamps are
  - Less power consumption
  - Less heat emission

NightEye H4 LED Retrofit lamp
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Retrofits in break lights

- LED Retrofits react faster to switch on than incandescent lamps:
  - Time advantage up to 260ms to full brightness
  - Distance advantage up to 3.5 m at 50 km/h
  - Sharp switch on process signalizes better immediate need of fast reaction to the driver of following car → less time loss for reaction
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**Retrofits in low beam head lights**

- LED Retrofits in head lights have advantages:
  - More brightness
  - Better contrast
  - Higher range

- LED Retrofits are able to fulfill the requirements of light distribution of UN ECE regulations for incandescent filament lamps

Low beam light distribution of Philips H4 lamp in BMW MINI head light (measured at Osram light channel 09/2017)
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Retrofits in low beam head lights

Low beam light distribution of Philips H4 lamp in BMW MINI head light (measured at Osram light channel 09/2017)
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Benefits of LED Retrofits

- LED Retrofits serve more safety by:
  - Lower failure rates
  - Better view at night
  - Easier detection of pedestrian
  - Higher protection of motorcycles
  - Faster signalling of braking procedure
  - Retrofitting present vehicle fleet
  - Better equipment for cheap and old cars
  - Shock proof lamps for trailors

Osram H7 LED Retrofit lamp in Hyundai i30 head light
Philips LED Retrofit lamps in VW Golf VI Variant rear light with clear cover
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Customers view

- LED Retrofit Lamps are common in lighting devices of daily use
  - Market is full of LED Retrofit products
  - Customer has no understanding for prohibition of LED Retrofits in vehicle use
  - Separation of good from not working LED lamps by legalisation with clear technical requirements
  - LED Retrofits are legal on some other continents

- With permission of LED Retrofits and developing technical parameters for legalisation, the producers of LED Retrofits will design fitting LED lamps promptly.

Ring Automotive LED Retrofit lamp with LED filament element in warm white light color (3000 K)
ADAC e.V.
Technology Center
Landsberg / Germany

We live Consumer Protection
transparent – innovative – visible

Thank you very much for your attention.