



TF SR-02-06

# LED Retrofit Lamps as replacement for incandescent lamps

Update / extension of UN ECE rules

23.01.2018

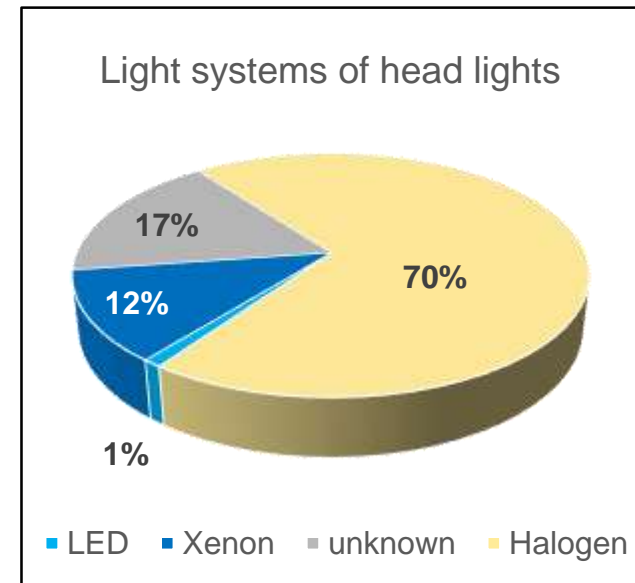
Burkhard Böttcher, FTK



# LED Retrofit Lamps as replacement for incandescent lamps

## 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)



Result of ADAC lighting check 2017

# LED Retrofit Lamps as replacement for incandescent lamps

## 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

# LED Retrofit Lamps as replacement for incandescent lamps

## 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

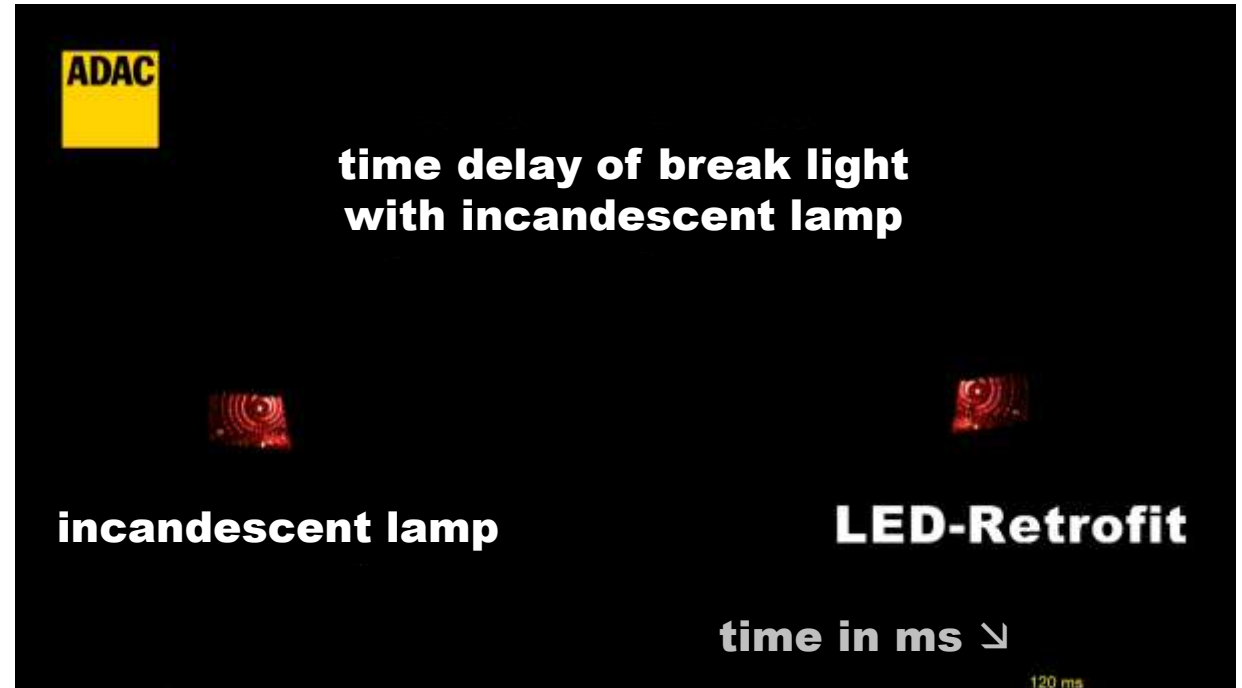


NightEye H4 LED Retrofit lamp

# LED Retrofit Lamps as replacement for incandescent lamps

## Retrofits in break lights

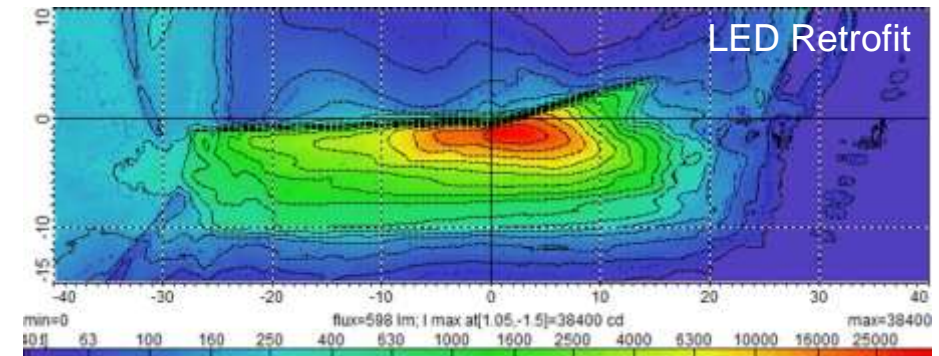
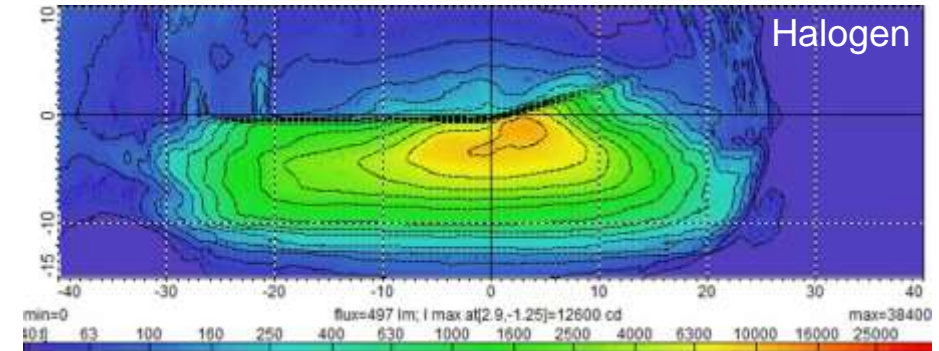
- **LED Retrofits react faster to switch on than incandescent lamps:**
  - Time advantage up to 260ms to full brightness
  - Distance advantage up to 3,5 m at 50 km/h
  - Sharp switch on process signalizes better immediate need of fast reaction to the driver of following car → less time loss for reaction



# LED Retrofit Lamps as replacement for incandescent lamps

## Retrofits in low beam head lights

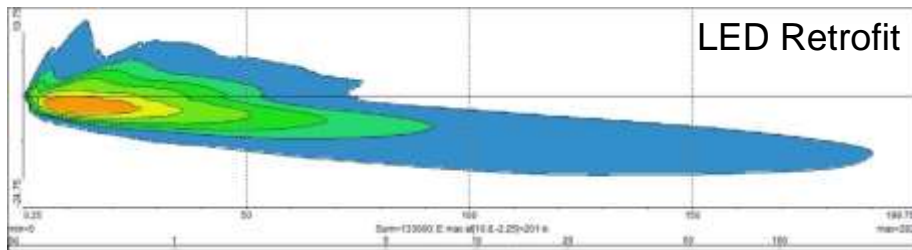
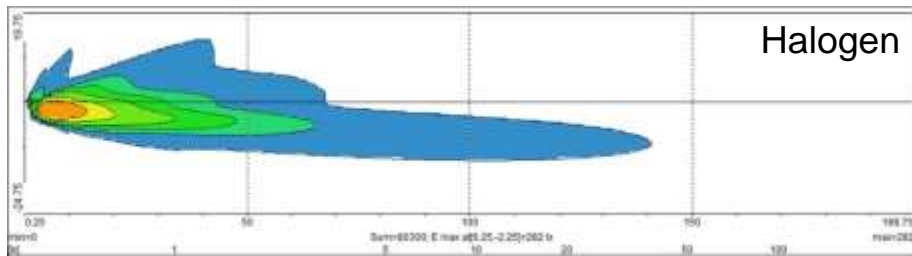
- LED Retrofits in head lights have advantages:
  - More brightness
  - Better contrast
  - Higher range
- LED Retrofits are able to fulfill the requirements of light distribution of UN ECE regulations for incandescent filament lamps



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

# LED Retrofit Lamps as replacement for incandescent lamps

## 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)

# LED Retrofit Lamps as replacement for incandescent lamps

## 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 trailers



Osram H7 LED Retrofit lamp  
in Hyundai i30 head light



Philips LED Retrofit lamps in  
VW Golf VI Variant rear light with clear cover



# LED Retrofit Lamps as replacement for incandescent lamps

## Customers view

- **LED Retrofits 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.**