

Transmitted by the expert from GTB

Informal document **GRE-73-24**
(73rd GRE, 14-17 April 2015,
agenda item 10 (b))

GTB Document No. **CE-5116 rev**
(*WG-LS document LS-1052*)
Date: 2015-04-15

GTB Working Group

Light Sources

Status April 2015



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*The International Automotive Lighting
and Light Signalling Expert Group*

Groupe de Travail "Bruxelles 1952"

Content

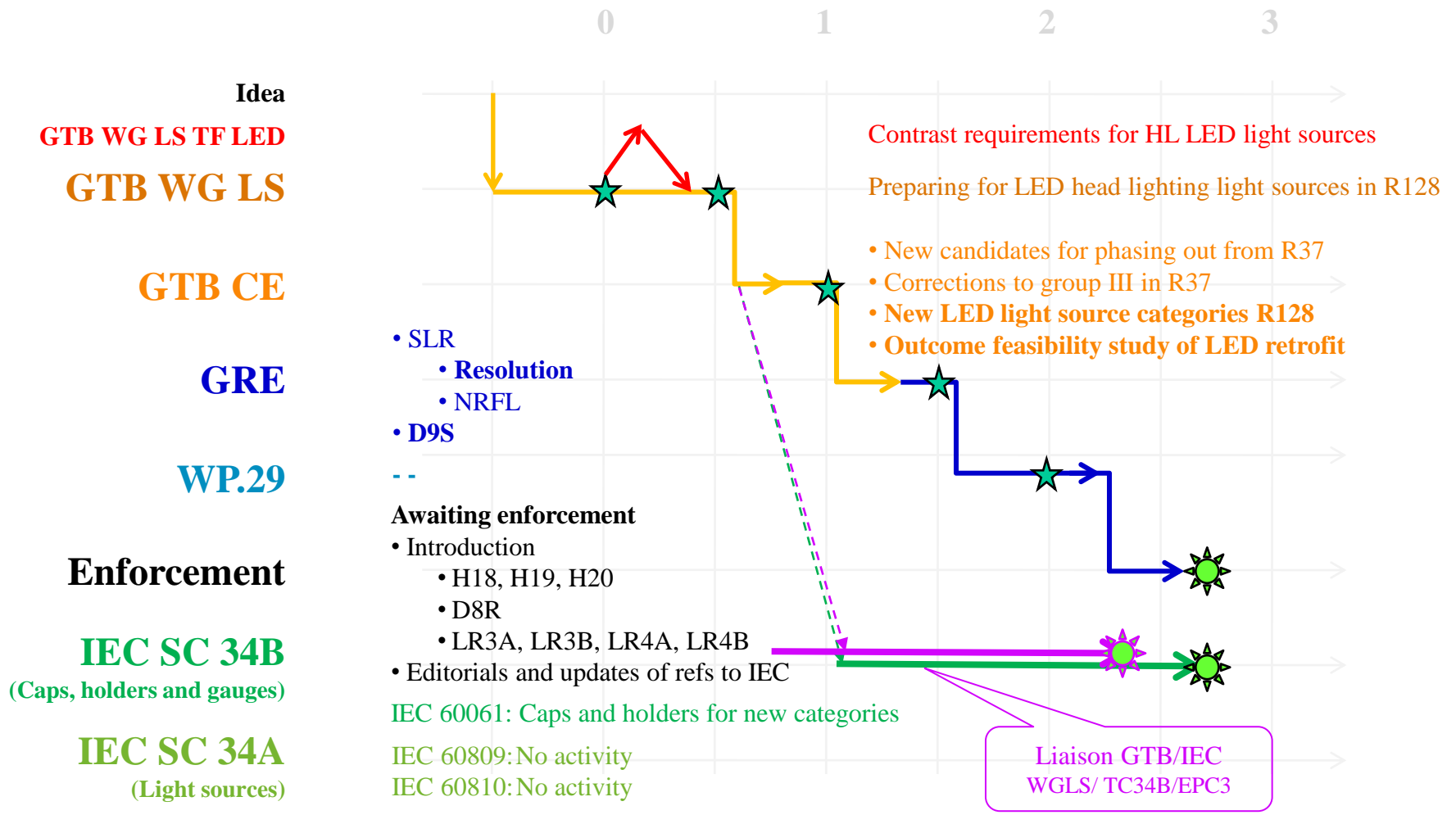
- Light source work items in the **pipeline**

WG LS → CE → ? → GRE:

- New LED light source categories
- Outcome of the feasibility **LED retrofit study***

*Progress reports: GRE-69-41, GRE-70-47, GRE-72-27

Light source work items the pipeline



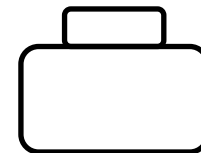
New LED light source categories R128



LR3	3.5W	80 lm	LW3	5W	250 lm	LY3	5W	150 lm
LR5	3.5W	120 lm	LW5	8W	350 lm	LY5	8W	280 lm

LR3 red is extended

- with a white and amber version
- with an L5 family with more luminous flux



LR3A

LR3B

Connector

General Lighting LED retrofit



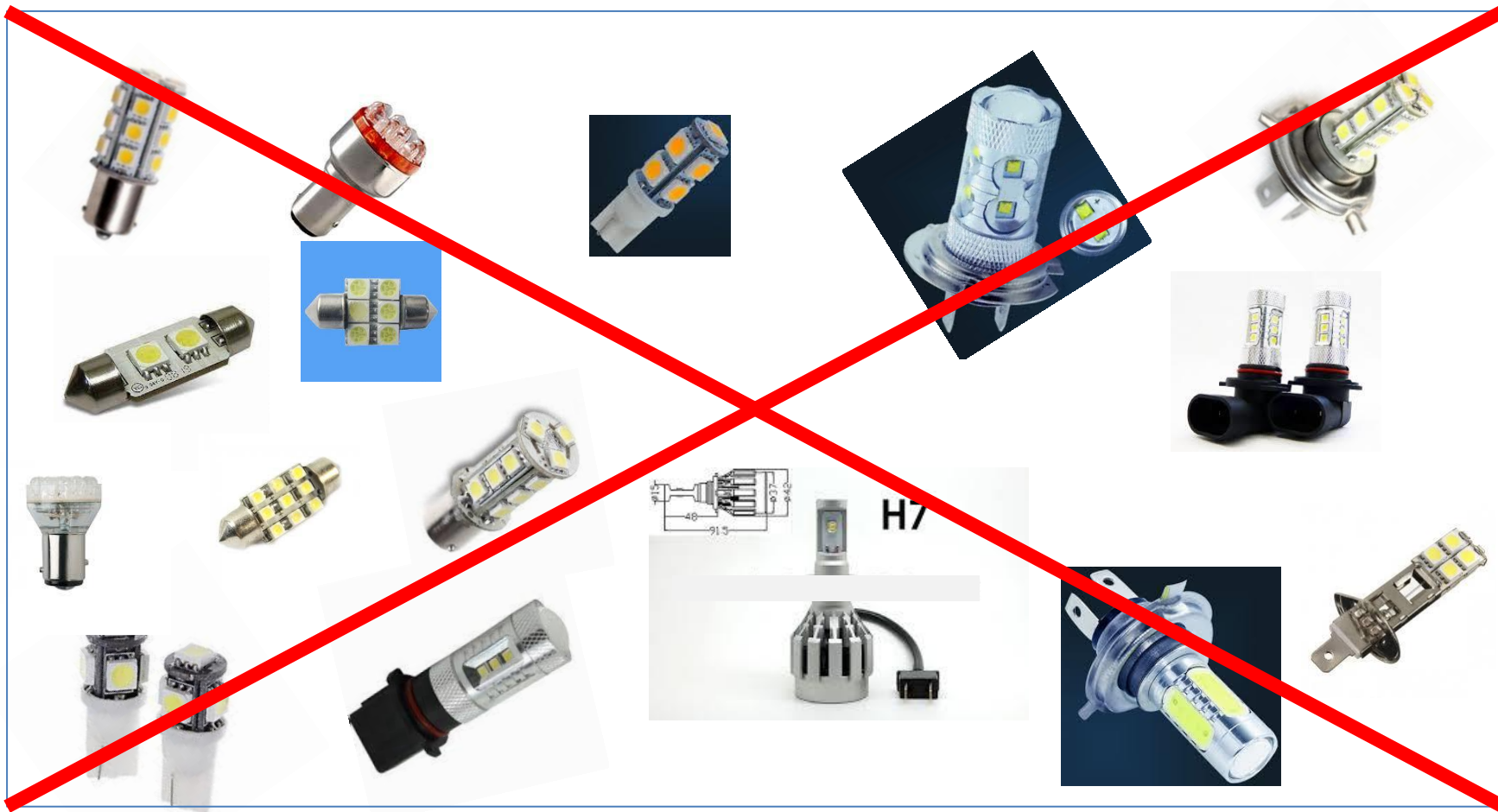
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Automotive LED retrofit



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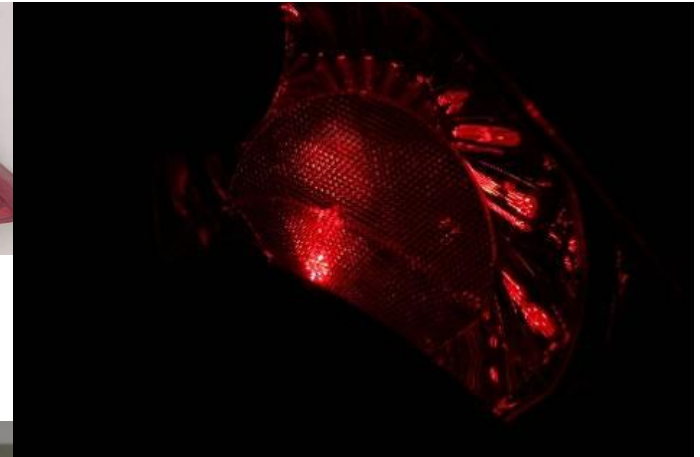
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LED retrofit in signal lighting example

approved filament lamp

vs.

non-approved LED retrofit



- | | | | |
|---------------------------|-----|-----|--------------------------------|
| ➤ Luminous output: | ok | vs. | not sufficient |
| ➤ Red color: | ok | vs. | ok |
| ➤ Emitter size: | 4mm | vs. | 12mm (too large) |
| ➤ Intensity distribution: | ok | vs. | does not fit to optical system |

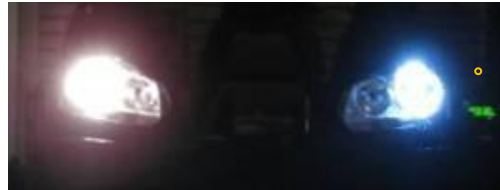
LED retrofit in front lighting

example

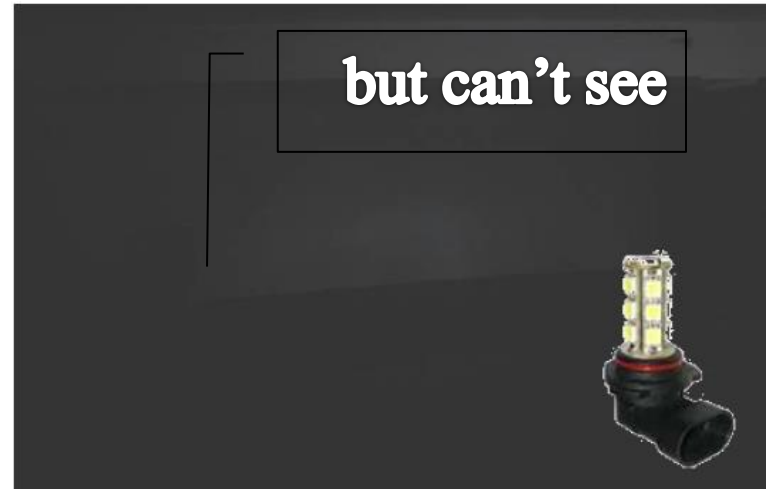
approved halogen light source

vs.

non-approved LED retrofit



looks cool



- | | | | |
|---------------------------|----------|-----|--------------------------------------|
| ➤ Luminous output: | 1100lm | vs. | 67lm |
| ➤ Color of light: | 3200K | vs. | 9300K (outside boundaries for white) |
| ➤ Emitter size: | 4mm | vs. | 20mm |
| ➤ Intensity distribution: | circular | vs. | non-symmetrical |

Automotive LED retrofit



NONE

GTB LED retrofit feasibility study

- Equivalence criteria
- Showcases C5W, PY21W and R5W

National law and European Directives (often) require
Approved and marked products

- Implementation into the UN Regulations

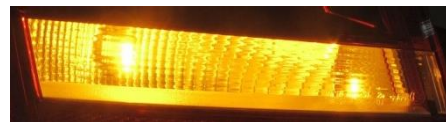
Target of the study

PY21W



ECE R6 compliant

LED retrofit PY21W



ECE R6 compliant

GRE-72-27



R37

Equivalence parameters



R128

Some Parameters:

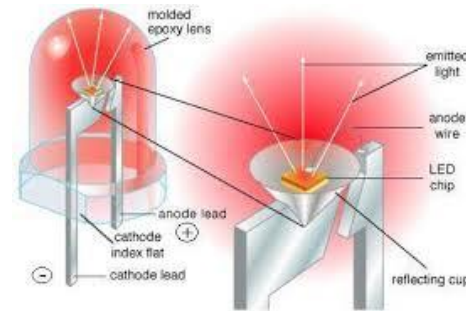
- Shall be the **same**
- Shall be **similar** within tolerances
- Are unavoidably **different** due to physical characteristics of the different technologies
- Parameters are **necessarily** specified for one but not for the **other technology**

Examples next sheets

Luminous intensity distribution

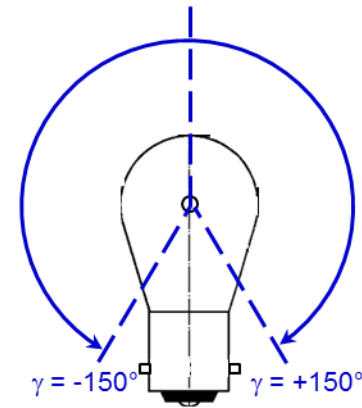
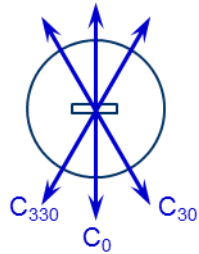
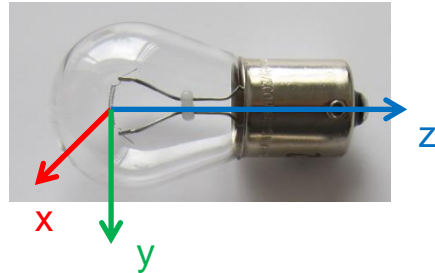
A filament lamp is radiating **omnidirectional** (Lambertian)
Except for in the axis of the filament

A LED is radiating directional

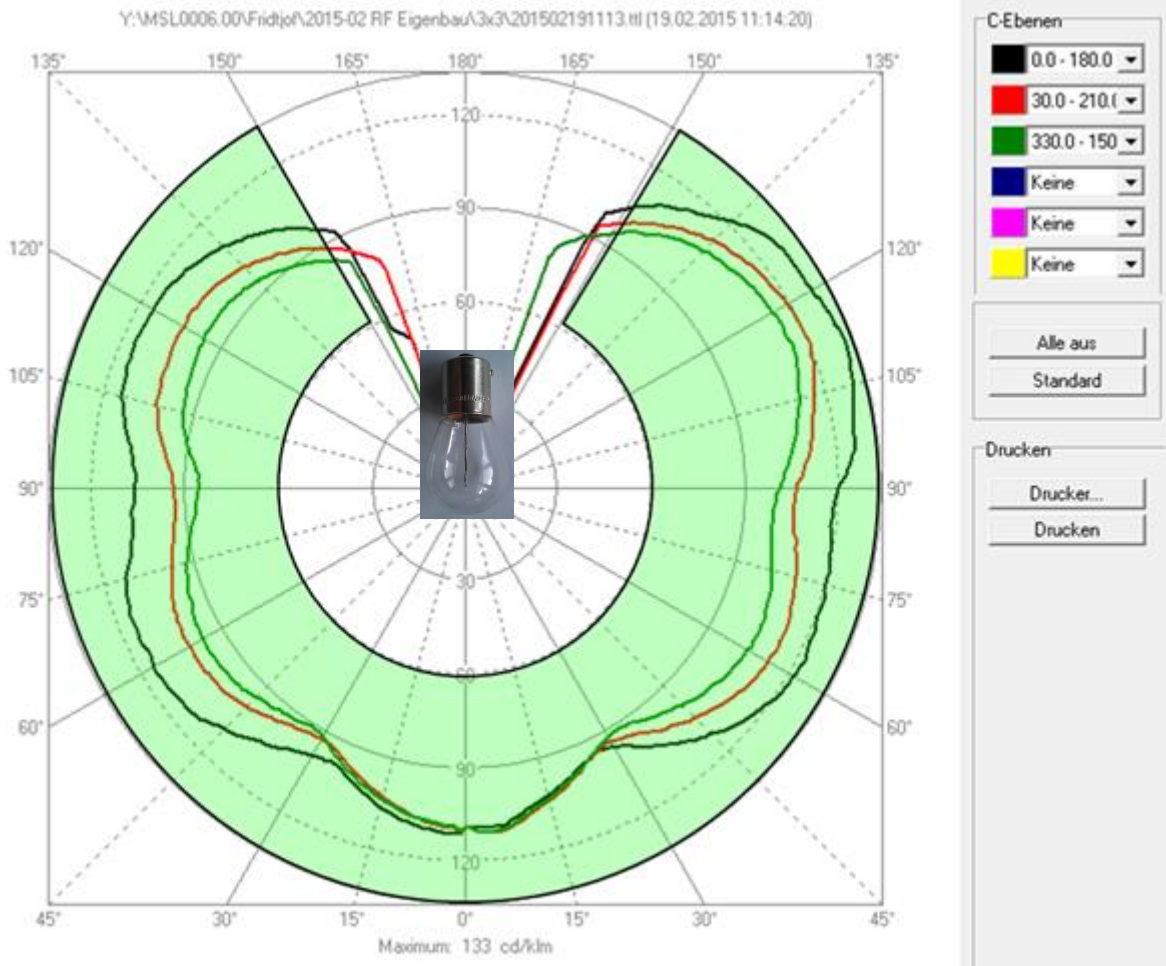


With a clever arrangement of LEDs or with a light guide the luminous intensity distribution of a filament lamp can be simulated.

Luminous intensity distribution

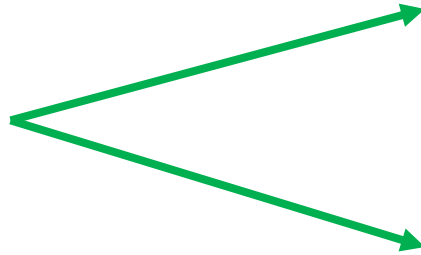


Well-known CIE C_γ system



Luminous flux
 $460 \pm 15 \%$

Good examples



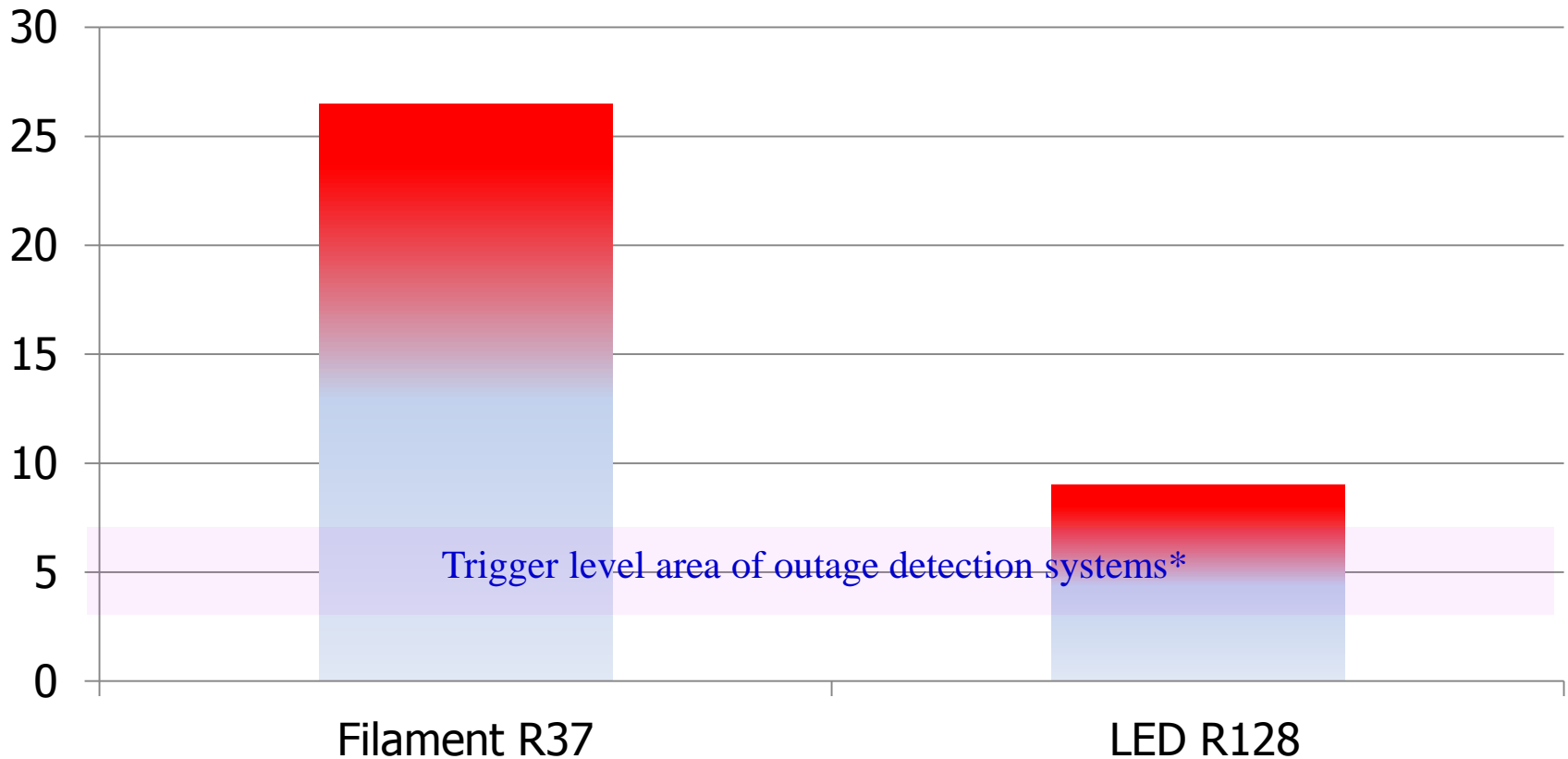
Using a light guide



Using an arrangement of LEDs

Power consumption

PY21W



* Seem absent in more than half of the vehicles on the road

Instructions for fitting a LED retrofit light source



Important

This LED retrofit light source is only suitable for fitment in the following vehicle models and for the functions stated. If incorrectly used this LED retrofit may cause a fault in your vehicles electrical system.

VEHICLE	LIGHTING FUNCTION(S)
(Unique Model identification)	(Lighting function according to R48)

Similar to:



child seats
R44, R129



Tyres
R30,
....



engine oil
brake fluid



batteries



LPG special retrofit
systems R115



spark
plugs



brake
pads
R90



windscreen
wipers



retrofit emission control
devices R132

Outcome of the feasibility LED retrofit study



YES, we can !

Yes, we can !

LED light source categories

- with **similar performance**

as the equivalent filament light source category

- of the **same category designation**

to avoid misunderstandings for

- the consumer
- periodical technical inspection
- the police

.....but...?...

- Some may have cold feet
 - Introducing legal and suitable LED retrofit light sourcesbut
 - There is no safe and legal alternative available for the public
 - This proposal is not about legalizing illegal **pseudo** retrofits
- This is about introducing legal and **true** retrofits
 - Suitable to really replace the original filament lamp
 - With instructions (for just one or two aspects)
- Please, inform us if any aspect has been overlooked
- Proposal next GRE74?

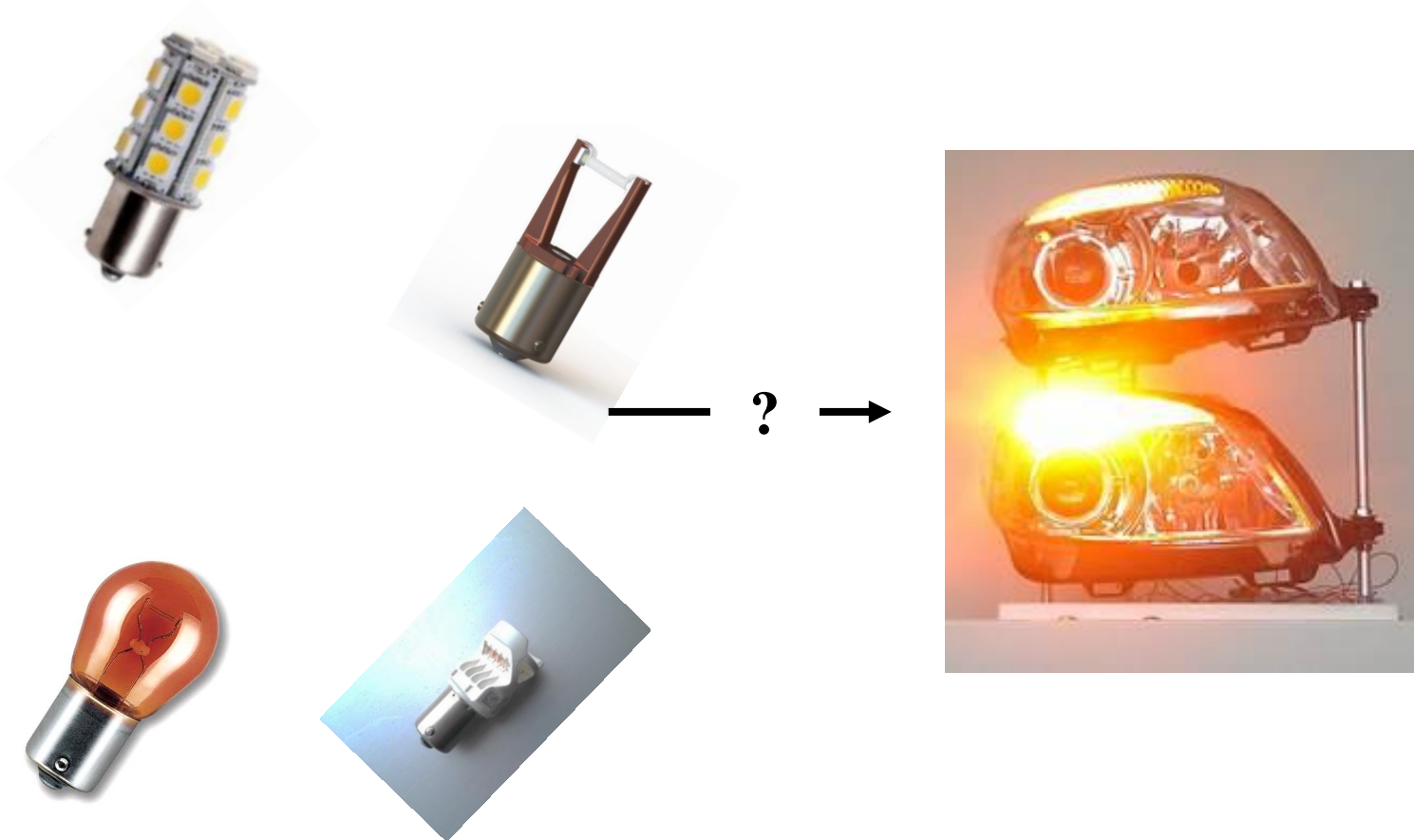
Spare parts

Question for guidance to WP.29 from the co-chairman of the informal group IWVTA, document WP.29-165-15-Rev.1:

- (1) Contracting Parties shall accept original equipment spare parts covered by IWVTA;
- Or,
- (2) **Contracting Parties shall accept all spare parts having valid UN approvals** for vehicles covered by IWVTA [original equipment and after market spare parts.]

Response: EC and NL: option 2

Demo



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We would appreciate your valuable input and guidance.

THANK YOU

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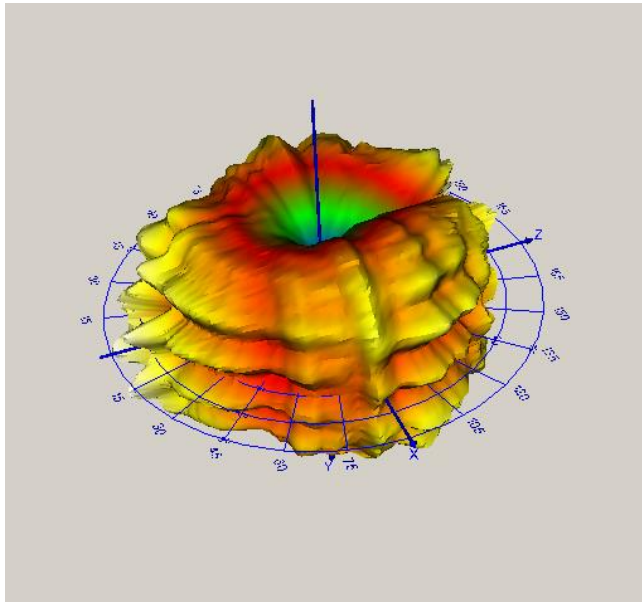
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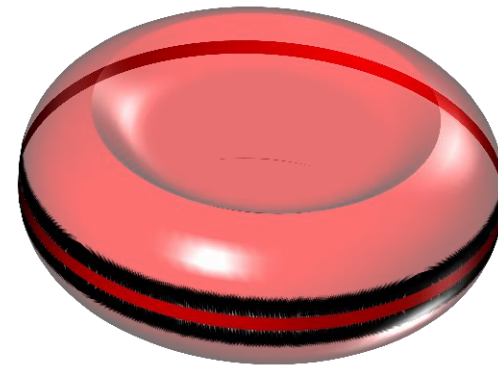
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ADDITIONAL MATERIAL

3D luminous intensity distribution

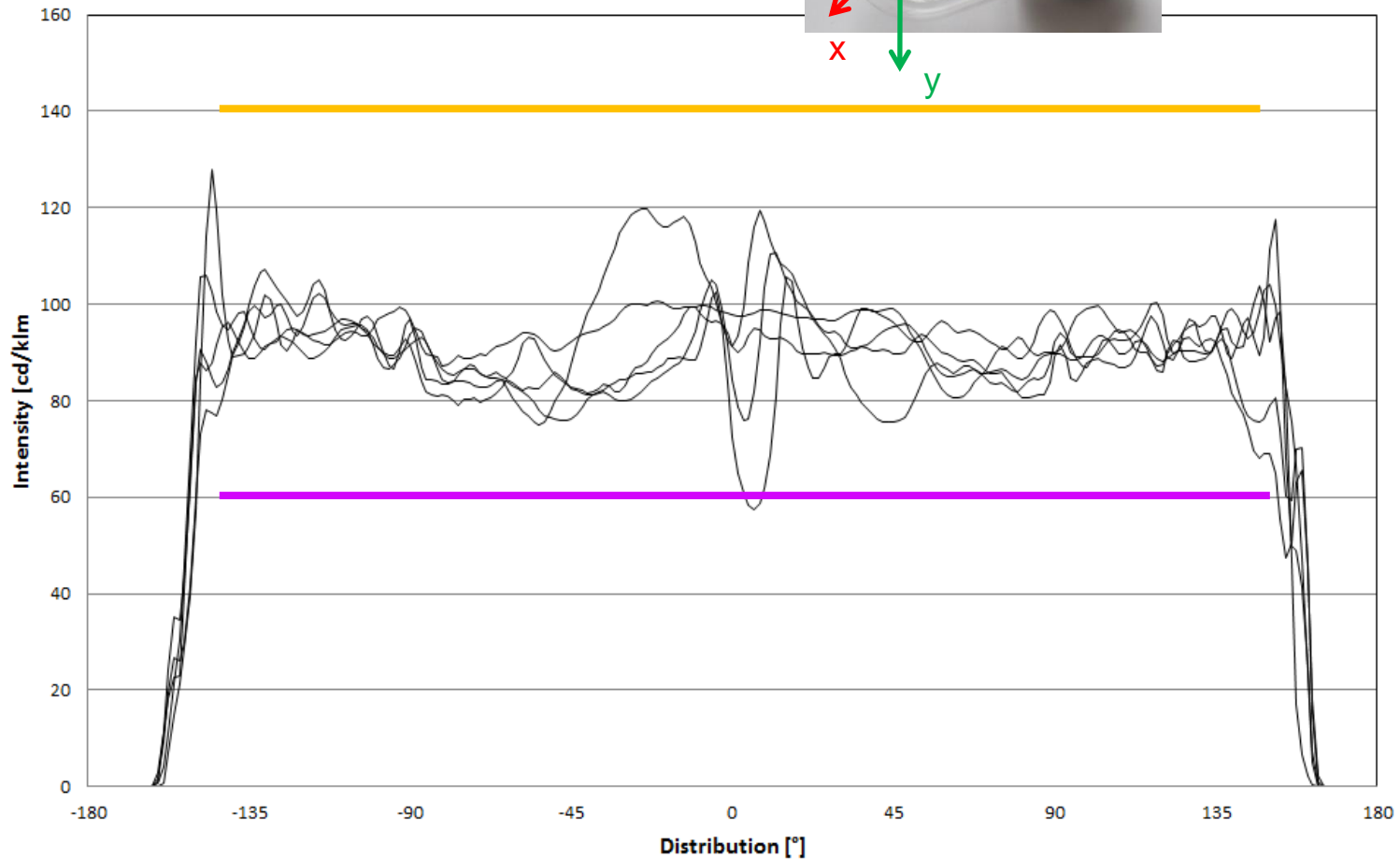
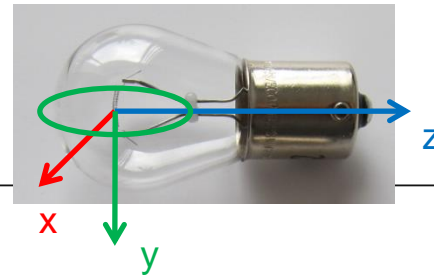


Measured sample



Inner and outer shell specifying the distribution

Horizontal intensity distribution



Luminous flux
 $460 \pm 15 \%$

— Max. intensity
— Min. intensity

END

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