

GTB
Working Group Light Sources

Replacement Light Sources
and
Compliance



WP.29 March 2012

item 4.2.4. “Request for guidance regarding non-conforming aftermarket light sources”

Background

Regular reports

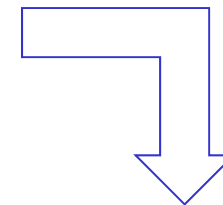
Light source work items in the pipeline

- GTB TF LED light sources
- **GTB WG Light Sources**
- GTB Committee of Experts
- GRE
- WP.29
- Awaiting enforcement



Request for guidance

- Replacement Light Sources and Compliance



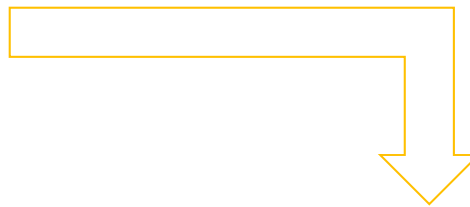
WP.29

Request for guidance

Much effort is spent to

- accurate specification of light source characteristics in UN Regulations
 - replacement aspects in view of safety
- additional/ reference specifications in IEC standards
 - obligatory: cap/holder, colour endurance
 - voluntary: e.g. shock and vibration
- conformity of production

⇒ OEM ✓
⇒ Aftermarket X



NEEDS IMPROVEMENT
Seek advise from WP.29

Content

1. Summary of applicable law
2. Safety aspects of replacement characteristics
3. Snapshot of aftermarket products and their quality
4. Consequences and ideas
5. Request for guidance

Summary of applicable law

Type approval <-> In use requirements

Lighting (components)

Bringing (mass production) vehicles on the road

- Well defined
- More and more globally harmonized
 - UN Regulations for contracting parties (58 Agreement)
 - More and more countries following the UN Regulations
 - Harmonisation SAE

Once on the road

- National law
- Very divers
 - Some countries refer to UN Regulations or implement into national law
 - Some countries do forbid application of non-approved components on the road, but do not forbid sales
 - Some countries do not forbid sales nor application of non-approved components

Safety aspects of replacement characteristics

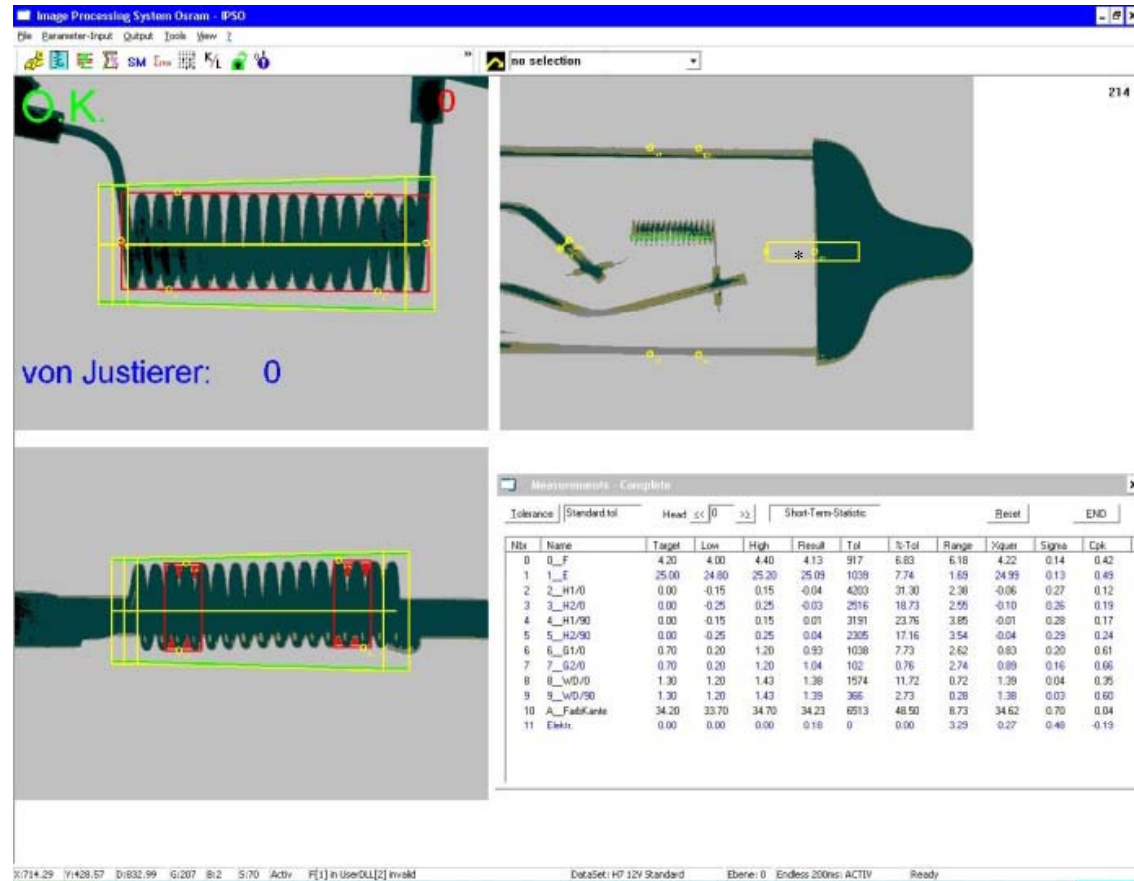
example: filament position

"Good" bulbs



Illumination – Position of Filament

“Good”



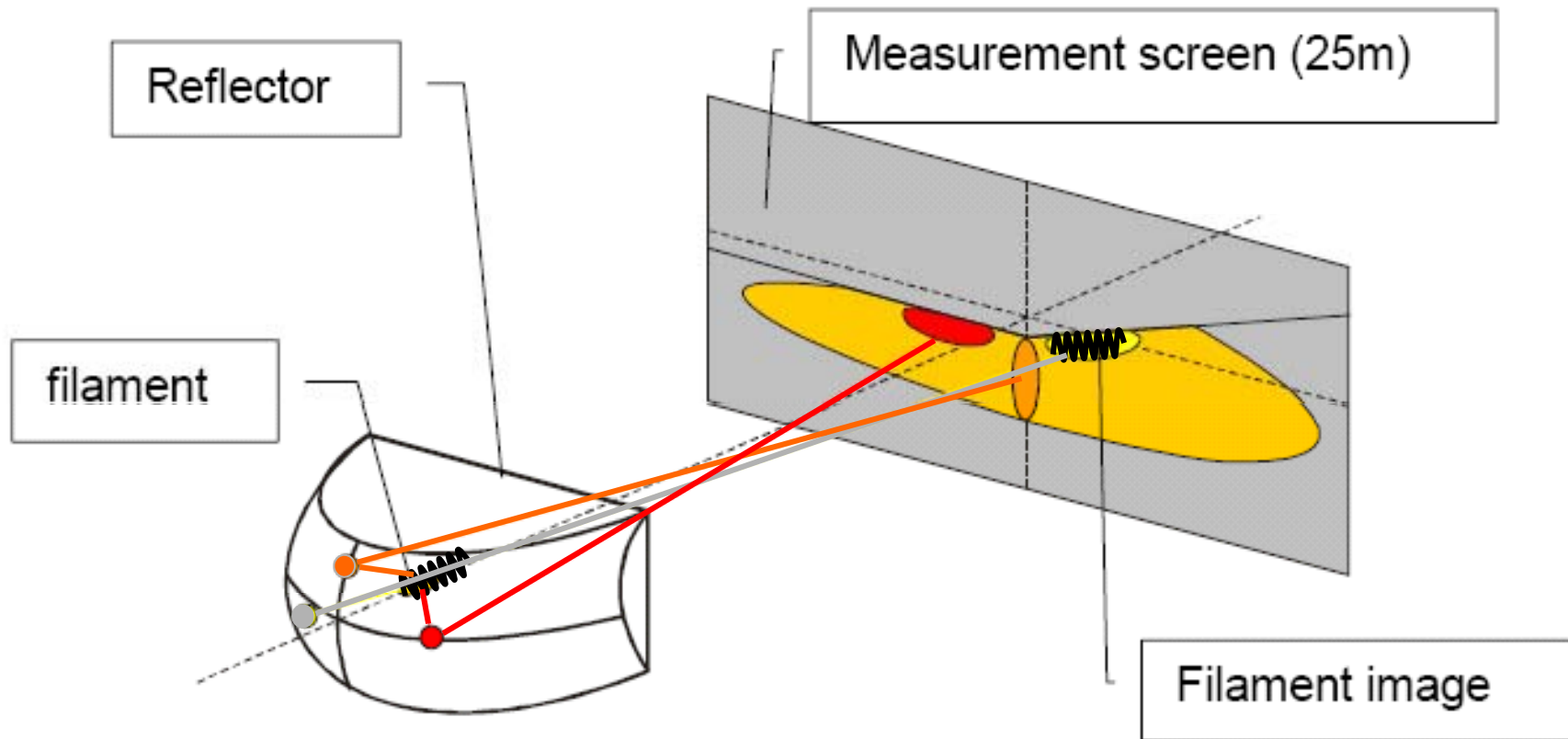
*yellow box right top is for automatic camera operation

G T B

The International Automotive Lighting
and Light Signalling Expert Group

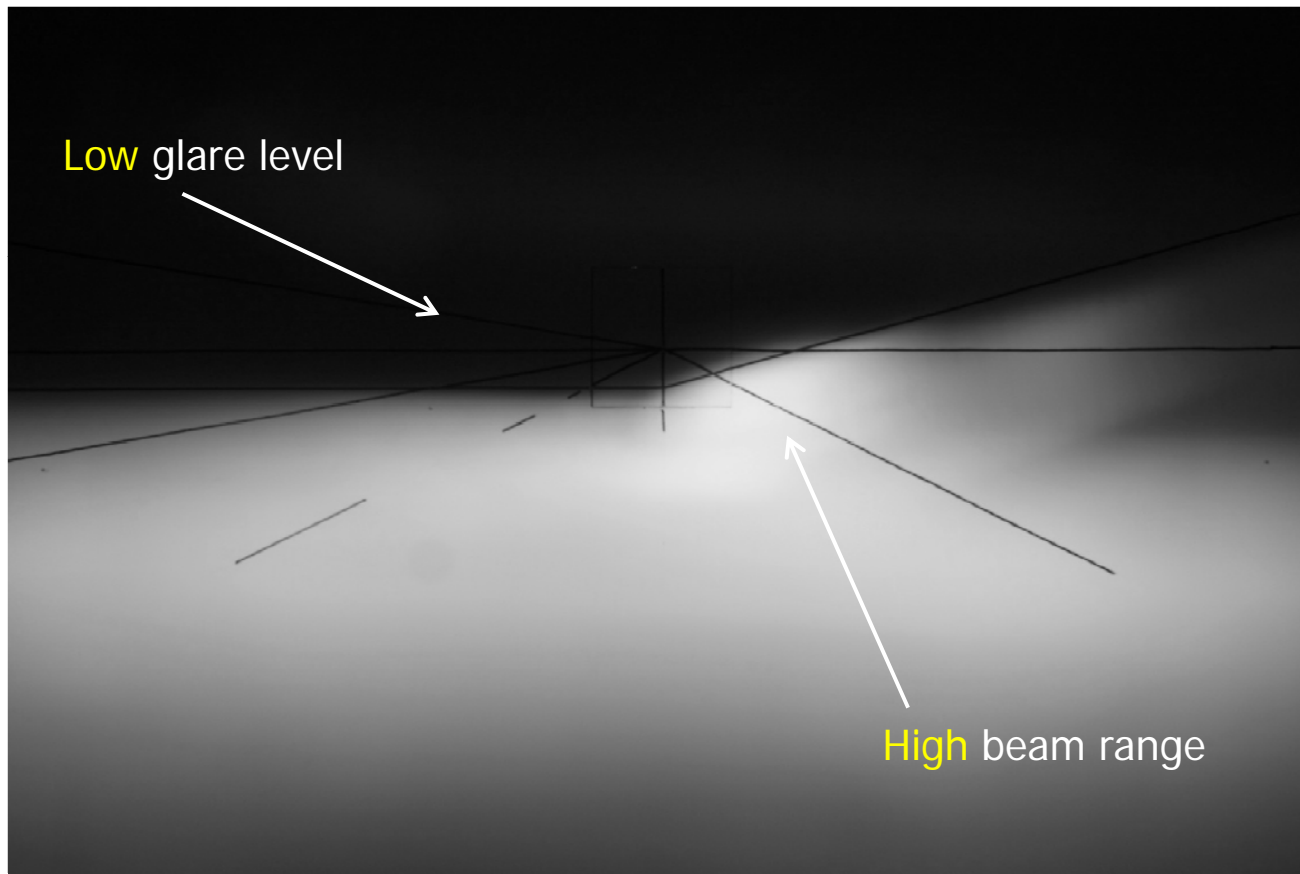
Groupe de Travail "Bruxelles 1952"

Principle of beam formation

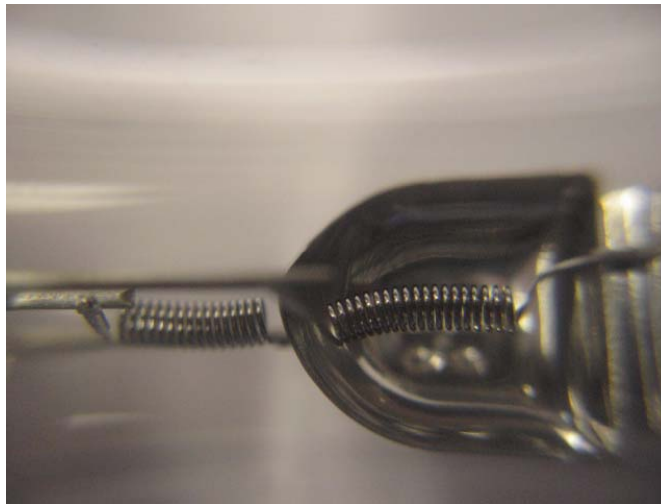


Not to scale

“Ideal” beam pattern



“Bad” bulbs



Illumination – Position of Filament

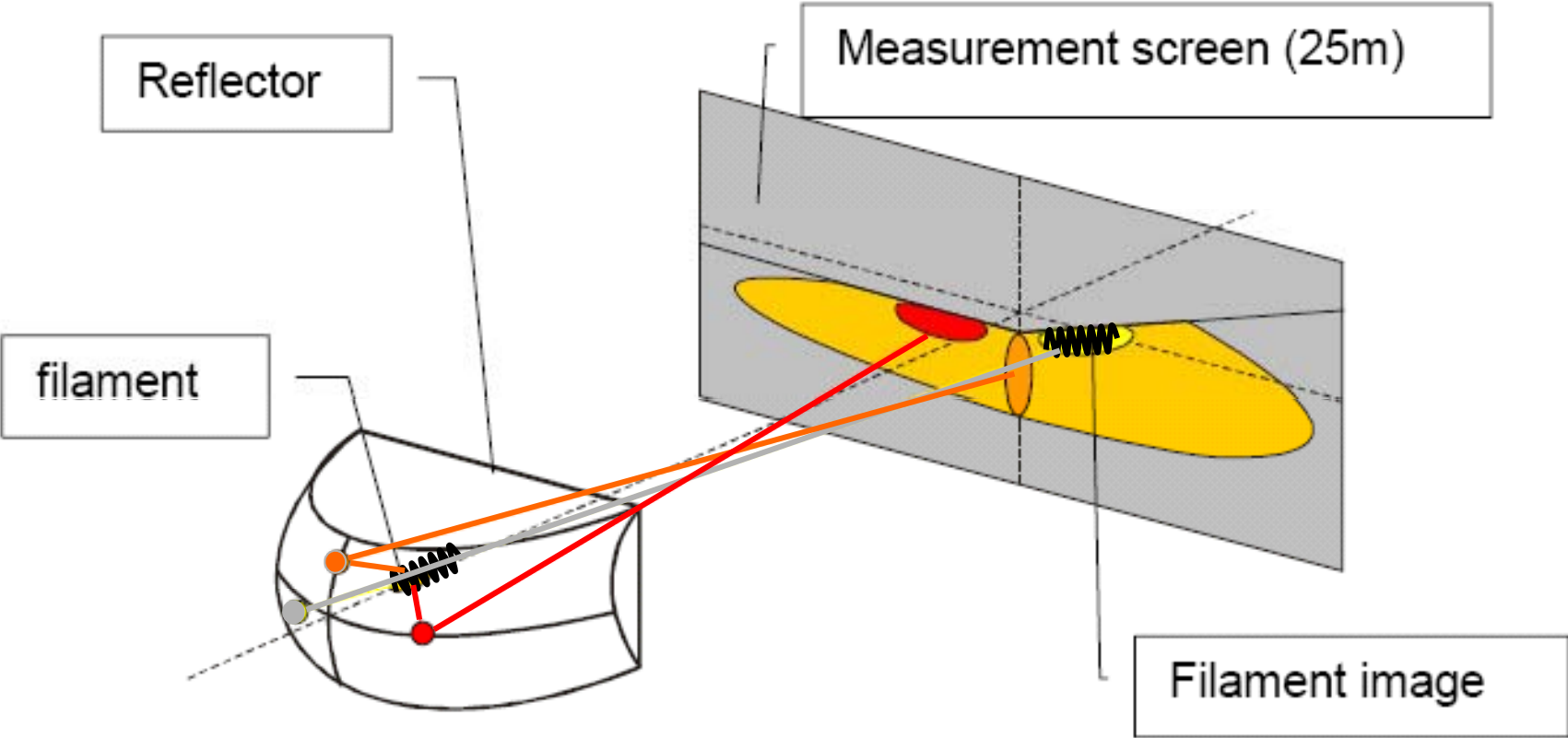
“Bad”

The screenshot shows the 'Image Processing System Optron' interface. The main image displays a filament lamp with a red bounding box around the filament and a yellow box in the top right corner. The text 'ToleranzFehler' and 'von Justierer: 0' is visible. A 'Measurements' window is open, showing a table of data for various parameters.

Obj.	Name	Target	Low	High	Result	Tol.	S.Tol	Range	Mean	Signa	Obj.
0	0_L	4.20	4.00	4.40	4.43	7.25	5.64	6.18	-4.22	0.14	0.44
1	1_L	25.00	24.00	26.00	26.52	0.51	6.00	1.63	24.99	0.13	0.50
2	2_H1/0	0.00	0.10	0.10	0.07	0.06	20.00	2.30	0.06	0.27	0.15
3	2_H2/0	0.00	0.20	0.20	0.36	2.23	16.20	2.95	0.11	0.25	0.23
4	4_H1/00	0.00	0.10	0.10	0.15	20.00	30.63	3.95	0.01	0.29	0.20
5	5_H2/00	0.00	0.20	0.20	0.15	19.63	15.05	3.54	0.04	0.29	0.28
6	6_G1/0	0.70	0.20	1.20	0.01	0.01	6.50	2.62	0.03	0.19	0.65
7	7_G2/0	0.70	0.20	1.20	0.42	0.01	6.64	2.74	0.09	0.15	0.69
8	8_W0/0	1.30	1.20	1.43	1.44	1.00	10.67	0.72	1.30	0.04	0.36
9	9_W0/90	1.30	1.20	1.43	1.33	2.00	2.21	0.29	1.30	0.03	0.63
10	A_FarbKarte	34.20	33.70	34.60	36.07	6.04	40.64	0.73	34.62	0.70	0.00
11	DskH	0.00	0.00	0.00	0.17	0	0.00	3.29	0.26	0.40	-0.19

*yellow box right top is for automatic camera operation

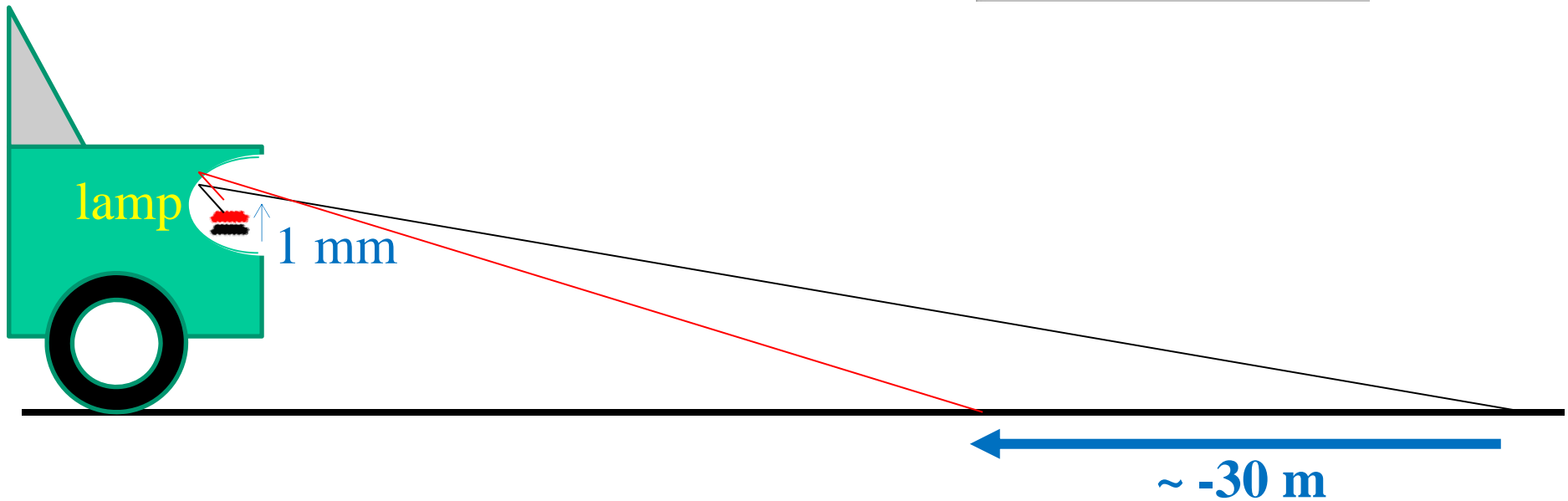
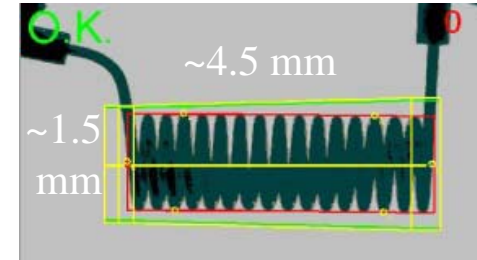
Reminder



Not to scale

One effect of displacement of the filament:

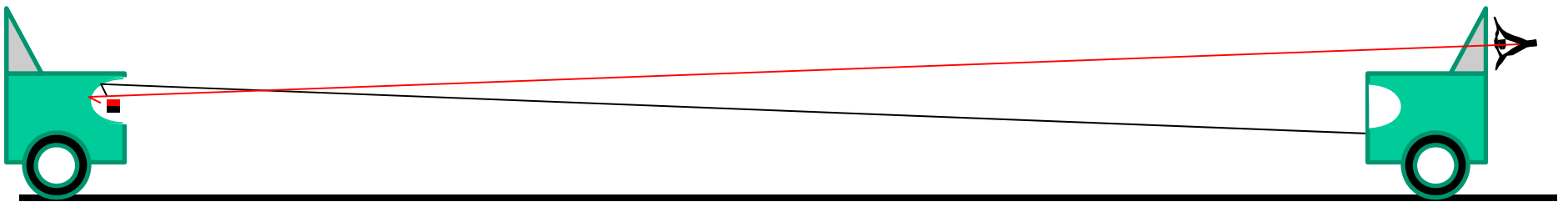
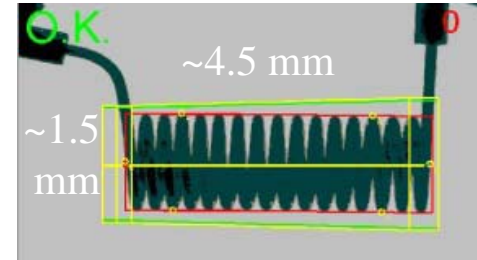
Δ visibility range



Not to scale

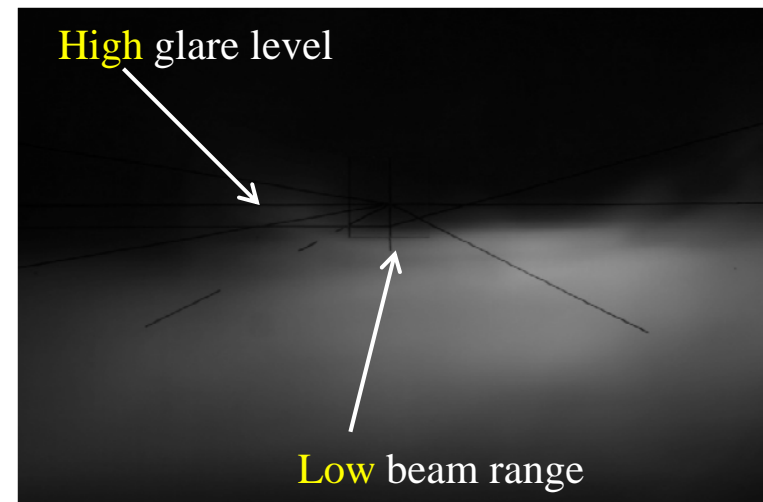
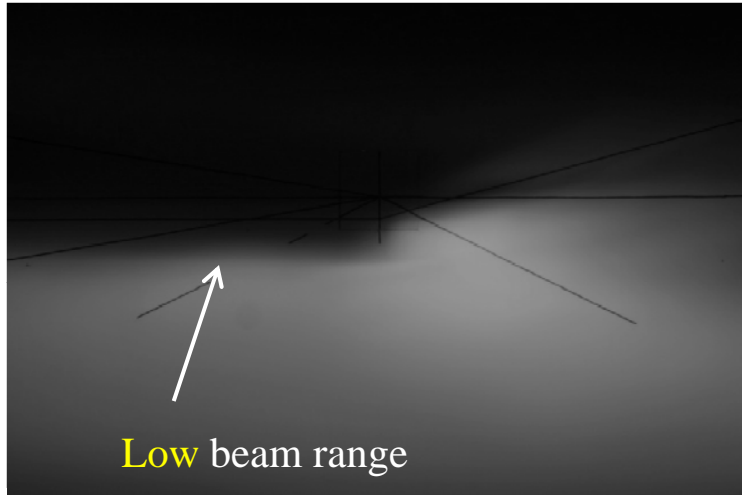
Another effect of displacement of the filament:

Δ glare



Not to scale

"Bad" beam pattern



Snapshot of aftermarket products

example: Bulb Test in country X*

* EU Contracting party to 58 Agreement

G T B

*The International Automotive Lighting
and Light Signalling Expert Group*

Groupe de Travail "Bruxelles 1952"

H7 Bulb Test

Production location	Import to EU			EU	
	#1	#2	#3	#4	#5
E-Mark	Yes**	Yes**	Yes**	Yes	Yes
Sample size	30	29	10	50	470
Visual check					
Geometry	27 out of 30 FAILED	28 out of 29 FAILED	9 out of 10 FAILED		
Photometry	9 out of 30 FAILED	15 out of 29 FAILED			
UN compliance					

no failures or within tolerance
up to 50% of sample size was out of tolerance
more than 50% of sample size was out of tolerance

** Real or fake?

Consequences

Daily consequences

Safety

- front lighting
 - not enough illumination of the road
 - increased glare
- signalling
 - insufficient visibility
- melting of plastic
- risk of explosion of the light source

Current Practice

- “bad bulbs”
 - lacking necessary clarity to know quality
 - normally cheaper
- “good bulbs”
 - less readily available
 - therefore less used

Why is aftermarket “bad” bulb cheaper?

Factors influencing quality

- materials
- supplier quality-philosophy
- production machine
 - selection
 - precision
 - maintenance
- quality checks
 - online
 - offline quality checks
- non-compliant bulbs
 - not thrown away
 - sold (yet E-marked)

may be up to 50%
of the total cost

Approval testing and certification

Profit margin structure

Possible ultimate consequence

compliant replacement products
are
no longer available

traffic safety
is
compromised

And how about these?

LED retrofit

all equipped with a cap in use by approved R37 light sources



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 |

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 |

Summary of issues

aftermarket

1. Requirements to replacement parts are not harmonised
2. Enforcement and surveillance is sometimes missing
3. Non-compliant products are not identifiable (consumer)
4. Compliant products may disappear from the market
5. Traffic safety may be compromised

how can this be avoided?

Ideas

EU framework directive 2007/46/EC

"Article 28

*1. Member States shall permit the sale or entry into service of components or separate technical units if **and only** if they comply with the requirements of the relevant regulatory acts and are properly marked in accordance with Article 19.*

"

Work programme on automotive legislation 2012 - 2013
Proposals under the responsibility of DG Enterprise & Industry

"...there is a need to strengthen the provisions permitting a better enforcement and surveillance of the market..."

Could this serve as a model for other regions/ countries ?

(Only those, not or little time and effort spending to enforcement and surveillance)

Referencing to UN Regulations

The 58 Agreement is about mutual recognition of type approval,
but it looks like
some countries refer to the UN Regulations for in-use compliance.

If this is a good method,
would it be possible/allowed/helpful to amend
UN Lighting Regulations,
so as to serve this purpose?

WP.29 Agenda

#156, March 2012

Agenda items that **might** give a clue for a start of resolving this issue

- **4.3.** Development of an International Whole Vehicle Type Approval (**IWVTA**) system and involvement of the Working Parties (GRs) on it
- **4.5.** Feasibility of establishing an electronic database for the exchange of type approval documentation (**DETA**)
 - Access for manufacturers (organizations) could be helpful
- **6.** Exchange of views on national/regional rulemaking procedures and **implementation** of established regulations/gtrs **into national/regional law**
- **8.9.** Exchange of information on **enforcement of issues regarding defects and not compliance**

Request for guidance

Request

1. Would WP.29 be prepared/ able to insert these issues in their agenda?
 - a. Would insertion of a requirement in UN regulations be allowed/ helpful for reference from national law and so promote harmonisation?
 - b. Could the EU framework art. 28 serve as a model for harmonisation?
 - c. Access for manufacturers (organisations) to DETA?

2. Or does WP.29 have another suggestion?

THANK YOU