

## 7<sup>th</sup> IWG VGL Justification for “box” boundaries

### Line 2 – [0.0;0.8] to [0.85;1.2]:

This line is a result of comparison between Kletwitz test and CIE XXXX (reference to be precised) TC4-45 method and a compromise.

Comparison of Kletwitz test and TC4-45 method:

- During Kletwitz test, it was defined a relationship between the pitch angle and the discomfort glare.

A passing beam cut-off line above the horizon increases the discomfort glare for oncoming drivers, depending on the headlamp mounting height.

(Reference: page 149 of VGL-05-04)

- Cut-off positions above horizon lead to weighted luminous flux values in TC4-45 glare zone above 1 lumen. (Reference: page 149 of VGL-05-04)

∩ The correlation between those two bullets allows to use TC4-45 glare calculations for the assessment of glare impact to oncoming drivers in real traffic situations. (Reference: page 152 of VGL-05-04)

After scientific calculations based on TC4-45 glare zone method, GTB/OICA defined a graph for mounting heights between 0.5m to 1.2m. (Reference: pages 164 to 166 of VGL-05-04)

From the GTB/OICA graph, the top left point is defined as [0.6;1.2]. (This is the initial brown line of the graph on page 2 of VGL-06-05)

However, during the 5<sup>th</sup> session of IWG VGL in Poland, Japan asks to keep the real value found from TC4-45 calculations: [0.85;1.2]. (Reference: page 167 of VGL-05-04)

The group agreed on that decision and the line 2 was defined consequently.

### Lines 4 – [1.6;0.8] to [2.4;1.2]:

The angle of line 4 is defined scientifically by the minimum requirement of 50m for road illumination distance independently on mounting height. Starting

point is [0;0]. This is an important prerequisite from the IWG Chairman Poland.

The value of 50m was under discussion at the 5<sup>th</sup> session of IWG VGL in Poland and Japan asked to keep it as minimum safety value.

### Line 1: [0.0;0.5] to [0.0;0.8]:

A basic straight line was extracted on the left side [0.4;0.5] to [0.6;1.2] (Reference: page 168 of VGL-05-04) but to avoid any confusion in Contracting Parties' mind, a compromise was decided to cut the area above 0 on X axis (aiming). This is result of basic assumption that when cut-off is over horizon high intensity of light obviously will hit the eye starting from given distance beyond vehicle. The result is the line 1:

[0.0;0.5] to [0.0;0.8]. (0.8 is a round value)

### Line 3: [1.6;0.5] to [1.6;0.8]

Carmakers made some studies about the tolerances needed for aiming independently from the levelling device type. The conclusion during the 5<sup>th</sup> session was that Industry needs a tolerance of 1.6%. So Japan proposed to follow the line 1 with an interval of 1.6. It was the start of this vertical line 3. The end point of this vertical line is defined by the angle of the line 4.

### Line 5 – starting from [0;0] crossing the point [1.6;0.5]:

This is issued from the same scientific calculation than for the line 4. The IWG Chairman Poland made, during the 6<sup>th</sup> 5<sup>th</sup> session of IWG VGL, a proposal to have 2 Classes for the road illumination distance: Previous 50m (Class 50) and alternative 30m (Class 30). This could allow slow moving vehicles city cars to have more tolerances due to

less safety needs their typical road uses.

Mis en forme : Exposit

Commenté [TT1]: Details of compromise will be helpful

Commenté [TT2]: dependence details will be helpful

Commenté [TT3]: The TC4-45 glare assessment proposal is arbitral and not enough verified to be base for legal decision. But it is useful for comparison of real headlamps. It of course returned high values for tested headlamps when cut-off was over horizon. This is not enough evidence that is appropriate measure but only special correlation: cut-off over horizon.

Commenté [TT4]: calculations cannot be scientific or not. Therefore they can be used as explanation where from are taken values in GTB/OICA proposal (some examples of real headlamp). But cannot be used as strong justification for proposal to be submitted to GRE.

Commenté [TT5]: Rather was proposed – why? Needed detailed explanation

Commenté [TT6]: It is not problem of confusing but conviction (assumption) that cut-off over horizon cause glare

Commenté [TT7]: Rather request

Commenté [TT8]: However Poland questioned this value, because procedure for testing pitch/load sensitivity take into account ageing of vehicle and testing condition cancel some other inaccuracies like cut-off non-repeatability. Also other similar results of 1.6% take into account conditions not influencing the results of type approval test (REG 48 Annex 6). Moreover Polish tests even different but confirm the range of 2.0%-3.5%-4% and repeatability looks to be much better than 1.6% requested by car manufacturers. To have convincing justification it is needed independent tests results which will be published and not confidential.