

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

This line is a result of comparison between Kletwitz test and 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)

A basic straight line was extract 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). → The result is the line 1: [0.0;0.5] to [0.0;0.8]. (0.8 is a round value)

### **Line 2 – [0.0;0.8] to [0.85;1.2]:**

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 3 and 4 – [1.6;0.5] to [1.6;0.8] and [1.6;0.8] to [2.4;1.2]:**

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.

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.

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 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 made, during the 6<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 city cars to have more tolerances due to their typical road uses.