**SLR-28-05**

**Letter from a citizen regarding the issue of glare received by the EC**

Dear Sir/Madam,

For some time, I have been increasingly disturbed by dazzle from cars on the roads due to:

1. an increase in the proportion of headlights with light sources which have a higher proportion of blue light (and greater light intensity), and
2. daytime running lamps which are often extremely bright because their light is not necessarily directed at the road surface. Third,
3. with bike lights becoming ever brighter, they are also creating unpleasant dazzle, especially because only very few cyclists make sure that the light beam is directed not forwards but slightly downwards, as is necessary.

The issue has become even more problematic because white LEDs now have efficiencies of nearly 50 %. The same applies to red LEDs¹. The result is that great brightness can be achieved using comparatively little electricity. This is exactly what manufacturers are doing. In my view, the EU needs to regulate not only because this dazzling effect could increase the risk of accident but also because it can harm the eyes (health aspect, still controversial).

The issue is discussed in detail below.

Yours faithfully,

== Looking at the three points individually ==

I will begin with point c). For the other points, technical rules and regulations can be used to make sure that other road users are not dazzled. In the case of cyclists, on the other hand, it is harder, because any cyclist:

1) can mount any light he or she pleases, and

2) can him- or herself more or less set the light beam (which in the case of a car would tend to be a matter for the garage).

The only effective measures in this area are therefore the following:

- a minimum diameter for the light source, so that the intensity of the radiation falling on any part of the retina is reduced;

- filtering the blue part of the spectrum, if need be by fitting existing lights with filters which significantly reduce wavelengths under approximately 500 nm, so that the blue peak of many LEDs at 450 nm is weakened sufficiently that the dazzling effect is significantly less troublesome.

From experience, halogen lamps are less dazzling. It can be deduced from this that putting a filter in front of the light can have the desired effect, and it would then not be so critical when cyclists do not adjust their lights properly. I would remark that particularly when cycling myself I am disturbed by dazzle from oncoming cyclists, especially on two-way cycle paths.

The second area I refer to above - daytime running lamps in cars (2008/89/EC) - could in the vast majority of cases be improved with the help of software updates to vehicles. This is because the brightness of many vehicle light sources is set by pulse width modulation (PWM). One often observes that the intensity of a daytime running lamp decreases significantly when the driver puts on their indicator to turn. Furthermore, daytime running lamps often remain on in the evening — when the headlights are on — but are visibly less bright. This level of brightness should not be exceeded during the day.

In this way, the legislature could improve most existing cars even without blue filters being fitted.

I would note that the perceived brightness often even exceeds that of bright ‘cloud air’ (*Wolkenluft*) [Translator’s note: meaning unclear]. That is unacceptable.

Finally to area a), i.e. car headlights. A blue filter or a light source with a low proportion of blue light would definitely be advisable because it is often the case that slightly to the right of the longitudinal axis of the car (in the direction of travel) the headlights are set slightly higher. This quite frequently leads to unpleasant dazzling, mainly in the rear-view mirror, but also looking forwards, because it would seem that many modern lens-based headlights have a less sharp cut-off above a certain point.

With all of this, it is important to me to stress that the maximum sensitivity of the human eye changes from about 550 nm to 500 nm on going from daytime to night-time conditions. The relative irritation we experience from the blue part of the light thus increases in the evening.

I hope that the EU will recognise this problem and will see to it that this development is curbed and that there are gradual improvements across the board.

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1. Brake lights now very often appear uncomfortably bright, as if there were no limits under a standard. Occasionally it is also the case that the ‘normal’ back light looks so bright that one thinks that the vehicle is braking.

2. According to the results of a research project into the photobiological safety of light-emitting diodes (<https://www.baua.de/DE/Angebote/Publikationen/Berichte/F2115.html>), many LED sources exceed the maximum luminance under EN 62471. It is also stated that although exposure times of under 10 seconds are unproblematic, all individual exposures during the course of a day must be taken into account (p. 87). See also standard EN 62471, Photobiological safety of lamps and lamp systems (including LED systems). The limits here relate to the irradiance but also to the radiance, i.e. the intensity, which is projected onto any point of the retina.