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Regulation No. 107 (M₂ and M₃ vehicles)

Proposal for amendments to Regulation No. 107 (M₂ and M₃ vehicles)

Submitted by the expert Germany*

The text reproduced below was prepared by the expert from Germany to amend UN Regulation No. 107 to improve the accommodation and accessibility for passengers with reduced mobility. The modifications to the current text of the 06 series of amendments to UN Regulation No. 107 are marked in bold characters for new and strikethrough for deleted characters.

* In accordance with the programme of work of the Inland Transport Committee for 2016–2017 (ECE/TRANS/254, para. 159 and ECE/TRANS/2016/28/Add.1, cluster 3.1), the World Forum will develop, harmonize and update Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.



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I. Proposal

List of contents, amend to read:

"Annex 5 ~~(Reserved)~~ Requirements to establish the visual contrast"

Insert new paragraphs 2.44. to 2.48. (Definitions), to read:

- 2.44.** "*Visual contrast*" (luminance contrast) means the brightness ratio between an object and its immediate background/surrounding which allows the object to be distinguished from its background/surroundings.
- 2.45.** "*Reflectance*" ρ (rho) is the quantitative ratio between reflected light and the incident light on the surface of a flat material. It consists of various portions of "regular reflectance" and "diffuse reflectance".
- 2.46.** "*Regular reflectance*" ρ_r is the reflection without diffusion in accordance with the laws of optical reflection as in a mirror.
- 2.47.** "*Diffuse reflectance*" ρ_d is the ratio of the light that has undergone diffuse reflection to the incident light.
- 2.48.** "*Luminous flux*" Φ (phi) describes the power of a light source."

Annex 3

Paragraph 7.6.12.1., amend to read:

- 7.6.12.1.** Service-door lighting ~~may shall~~ be provided to illuminate the flat, horizontal portion of the ground defined in paragraph 7.6.12.2. so as to aid passengers boarding and alighting the vehicle and to enable the presence of a passenger within this portion of the ground to be detected by the driver from his seat."

Paragraph 7.6.12.2., amend to read:

- 7.6.12.2.** Service-door lighting, ~~if fitted~~, shall:"

Paragraph 7.7.7.4., amend to read:

- 7.7.7.4.** Where there is more than one step, each step may extend into the area of the vertical projection of the next step by up to 100 mm and the projection over the tread below shall leave a free surface of at least 200 mm (see Annex 4, Figure 8) with all step nosings being designed such as to minimize the risk of tripping. ~~All step nosings shall contrast visually with their immediate surroundings. The outer edge of any step nosing shall be clearly marked over the whole width of the step with a coloured band of 40 mm to 50 mm in depth on the step and of 10 mm to 20 mm on the step riser which is either white or yellow or provides a visual contrast of $C \geq 0.4$ and a diffuse reflectance ρ_d of at least 0.5 according to Annex 5.~~

Paragraph 7.7.9.1., amend to read:

- 7.7.9.1.** On vehicles of Classes I, II and A, a means shall be provided to enable passengers to signal that the driver should stop the vehicle. The controls for all such communication devices shall be capable of being operated with the palm of the hand. There shall be appropriate communication devices distributed adequately and evenly throughout the vehicle and no more than 1,500 mm from the floor; this does not exclude the possibility of installing higher additional communication devices.

Controls shall either be white or yellow or provide a visual contrast $C \geq 0.4$ and a diffuse reflectance ρ_d of at least 0.5 according to Annex 5 visually with their immediate surroundings. Activation of the control shall also be indicated to the passengers by means of one or more illuminated signs. The sign shall display the words "bus stopping" or equivalent and/or a suitable pictogram and shall remain illuminated until the service door(s) open. Articulated vehicles shall have such signs in each rigid section of the vehicle. Double deck vehicles shall have them on each deck. The provisions of paragraph 7.6.11.4. of this annex apply to any textual markings used.

The provisions of paragraph 7.6.11.4. apply to any textual markings used."

Insert new paragraphs 7.7.15. and 7.7.15.1., to read:

"7.7.15. Audible information

- 7.7.15.1. A sufficient number of loud speakers shall be distributed evenly throughout the passenger compartment and in the toilet compartment, if fitted, to enable announce necessary information."**

Paragraph 7.11.1.5., amend to read:

- "7.11.1.5. The surface of every handrail, handhold or stanchion shall be clearly marked with a band of colour which is either white or yellow or provides a visual contrast of $C \geq 0.4$ and a diffuse reflectance ρ_d of at least 0.5 according to Annex 5 visually with their immediate surroundings and be slip-resistant."**

Paragraph 7.11.4., amend to read:

- "7.11.4. (Reserved) Handrails and handholds in toilets."**

Insert new paragraph 7.11.4.1., to read:

- "7.11.4.1. If a toilet is fitted, a suitable handrail or handhold shall be provided in the interior."**

Annex 5, amend to read:

"Annex 5

(Reserved) Requirements to establish the visual contrast

- 1. The visual contrast C shall be established according to the following formula:**

$$C = \frac{|\rho_1 - \rho_2|}{\rho_1 + \rho_2}$$

With: ρ_1 = the reflectance of the material of the object to be seen

ρ_2 = the reflectance of the area resp. material surrounding the contrast object

2. For determination of the reflectance values ρ_1 , ρ_2 and ρ_d an integrating sphere according to CIE 38:1977 shall be used.

The reflectance shall be either read directly from the indicating instrument or calculated according to the following formula:

$$\rho = \frac{\Phi_2}{\Phi_1}$$

Where:

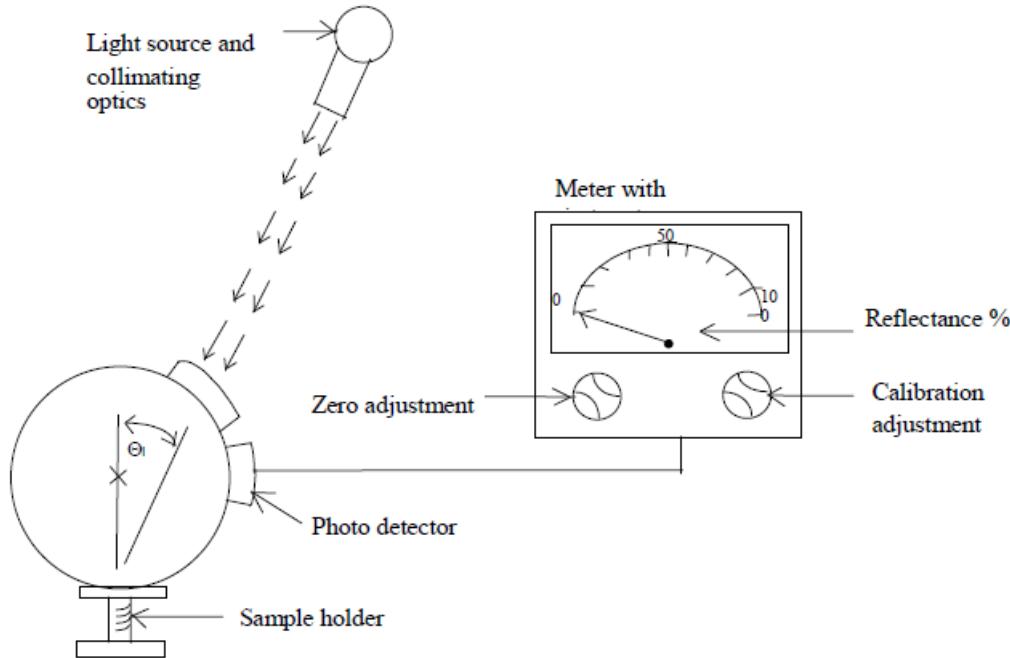
Φ_1 = luminous flux of the incident light on the material sample;

Φ_2 = luminous flux of the reflected light (reflectance).

- 2.1. The illumination angle of the luminous flux of the incident light on the sample Θ_i shall be equal to $8^\circ \pm 0.5^\circ$.

- 2.2. The luminous flux of the incident light on the sample shall be determined by using a diffuse reflectance standard calibrated by an accredited laboratory. The extended measurement uncertainty shall be lower than 3 per cent.

4. Example of an integrating sphere according to CIE 38:1977:



Annex 8

Insert new paragraph 3.2.4., to read:

- "3.2.4. Each priority seat shall be provided with a 3.5 mm jack socket according to IEC 60603-11 to enable the priority seat occupant to have undisturbed access to any audible information."

Paragraphs 3.2.4. to 3.2.8. (former), renumber as paragraphs 3.2.5. to 3.2.9.

Paragraph 3.3.3., amend to read:

- "3.3.3. ~~(Reserved)~~ These communication devices shall:

- 3.3.3.1. provide either a visual contrast of $C \geq 0.4$ and a diffuse reflectance ρ_d of at least 0.5 according to Annex 5 or be white or yellow,
- 3.3.3.2. provide a tactile surface, i.e. protrude from the surrounding areas,
- 3.3.3.3. provide an audible and visible signal to confirm successful activation."

Paragraph 3.5., amend to read:

- "3.5. Floor slope

The slope of any gangway, access passage or floor area between any priority seat ~~or wheelchair space~~ and at least one entrance and one exit or a combined entrance and exit shall not exceed 8 per cent. **The slope of any gangway, access passage or floor area between any wheelchair space and at least one entrance and one exit or a combined entrance and exit shall not exceed 5 per cent.** Such sloping areas shall be provided with a slip-resistant surface. **However, in the gangway, access passages or floor area where differently directed slopes merge these limits may be exceeded provided the total amount of these areas is not greater than 25 per cent of the total amount of the area swept by the wheelchair to reach the wheelchair area."**

Paragraph 3.6.1., amend to read:

- "3.6.1. For each wheelchair user provided for in the passenger compartment there shall be a special area at least 750 mm wide and 1,300 mm long **and 1,400 mm high.** The longitudinal plane of the special area shall be parallel to the longitudinal plane of the vehicle and the floor surface of the special area shall be slip resistant and the maximum slope in **any forward and rearward direction** shall not exceed 5 per cent. **In the lateral direction the slope shall not exceed 3 per cent. However, at the rear end of the wheelchair area where differently directed slopes merge these limits may be exceeded provided the total amount of these areas is not greater than 25 per cent of the wheelchair area. Furthermore, in the case of a rearward facing wheelchair complying with the requirements specified in paragraph 3.8.4., the slope in the longitudinal direction shall not exceed 8 per cent provided that this slope inclines upwards from the front end to the rear end of the special area.**

In the case of a wheelchair space ... as shown in Annex 4, Figure 22."

Insert new paragraphs 3.12. to 3.12.1.3., to read:

- "3.12. **Marking of passenger seats**
- 3.12.1. **Each gangway passenger seat in a vehicle of Class III shall be marked with its own number and the number(s) of the seat(s) adjacent to it. These numbers shall:**
 - 3.12.1.1. **be written in Braille,**
 - 3.12.1.2. **be written in a tactile writing form with a pyramidal cross-section with a 15 mm palpable upper edge, at least 1 mm height of relief and at least 1 mm width of line,**
 - 3.12.1.3. **be written in white or yellow or provide a visual contrast of $C \geq 0.4$ and a diffuse reflectance ρ_d of at least 0.5 according to Annex 5."**

II. Justification

1. Although the current provisions in UN Regulation No. 107 already address the needs of persons with reduced mobility, Germany sees a necessity to further improve the conditions for the access and accommodation in buses and coaches for persons with handicaps.
 2. This proposal includes improvements for wheelchair users and for persons who are visually and/or hearing impaired. It will be an important step towards improving mobility by introducing harmonized requirements.
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