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**ECONOMIC COMMISSION FOR EUROPE**

INLAND TRANSPORT COMMITTEE

World Forum for Harmonization of Vehicle Regulations (WP.29)

Working Party on Lighting and Light-Signalling (GRE)

(Fifty-sixth session, 4-7 April 2006,  
agenda item 9.)

PROPOSAL FOR DRAFT SUPPLEMENT 3 TO REGULATION No. 104

(Retro-reflective markings)

Transmitted by the expert from the European Association of Automobile Suppliers (CLEPA)

Note: The text reproduced below was prepared by the expert from CLEPA in order to introduce requirements for resistance to power washing and adhesion strength of retro-reflective markings. The text is based on a document without an official symbol (informal document No. GRE-55-3), distributed during the fifty-fifth GRE session (TRANS/WP.29/GRE/55, para. 38). The modifications to the current text of the Regulation are marked in **bold** characters.

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Note: This document is distributed to the Experts on Lighting and Light-Signalling only.

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**A. PROPOSAL**

Annex 8

Paragraph 5., amend to read:

**"5. Cleaning**

**5.1. Manual cleaning**

**5.1.2.** A test sample smeared with a mixture of detergent lubricating oil and graphite shall be easily cleaned without damage to the retro-reflective **surface** when wiped with a mild aliphatic solvent such as n-heptane, followed by washing with a neutral detergent.

**5.2. Power washing**

**5.2.1.** When subjected to a continuous spraying action for 60 seconds, a test sample shall show no damage to the retro-reflective surface or delaminate from the substrate under the following set-up parameters:

- **Maximum water/wash solution pressure 80 bar**
- **Maximum water/wash solution temperature 60°C**
- **The tip of the cleaning wand to be positioned at a minimum of 600 mm away from the material**
- **Cleaning wand to be held at no greater angle than 45 degrees from perpendicular to the retro-reflective surface**
- **40 degree nozzle creating wide fan pattern."**

Insert a new paragraph 8., to read:

**"8. Bonding strength (in the case of adhesive materials)**

**8.1.** The adhesion of retro-reflective materials shall be determined after 24 hours curing time by utilising a 90 degree peel on a tensile strength testing machine.

**8.2.** The retro-reflective materials shall not be easily removable without damaging the material.

**8.3.** The retro-reflective materials shall not be removable from their substrate when subjected to a force of less than 10 N per 25 mm width, at a constant speed of 300 mm per minute."

**B. JUSTIFICATION**

Currently, the tests contained in Annex 8 of Regulation No. 104 do not include performance requirements for adhesion strength of conspicuity markings or resistance to power washing, which is the industry standard. This proposal remedies this situation.

At a third meeting of the Informal Group "Conspicuity Markings (CM)," CLEPA was requested to prepare a proposal to amend Regulation No. 104 to enhance the above Regulation and further ensure proper performance of conspicuity markings, as installed on vehicles and their trailers.

GRE may wish to consider this proposal in conjunction with the draft proposal from the CM Informal Group to amend Regulation No. 48 for mandatory fitment of conspicuity markings on certain categories of vehicles and their trailers.

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