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**Economic Commission for Europe**

Inland Transport Committee

**World Forum for Harmonization of Vehicle Regulations****Working Party on General Safety Provisions****114th session**

Geneva, 9-13 April 2018

Item 4(b) of the provisional agenda

**Amendments to safety glazing regulations:****UN Regulation No. 43 (Safety glazing)****Proposal for Supplement 8 to the 01 series of amendments to UN  
Regulation No. 43 (Safety glazing)****Submitted by the expert from Finland\***

The text reproduced below was prepared by the expert from Finland to enable the approval of the laminated-glass panes with improved mechanical properties. The modifications to the current text of UN Regulation No. 43 are marked in bold for new characters and as strikethrough for deleted ones.

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\* In accordance with the programme of work of the Inland Transport Committee for 2014–2018 (ECE/TRANS/240, para. 105 and ECE/TRANS/2014/26, cluster 02.4), the World Forum will develop, harmonize and update UN regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

GE.18-01038(E)



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## I. Proposal

*Paragraph 5.5.8.*, amend to read:

"5.5.8. XI In the case of a laminated-glass panes. **In addition, the appropriate application will be signified by:**

**/D For panes, which are subjected to the 2,260 g ball test and the headform test."**

*Paragraph 8.2.1.1.*, amend to read:

8.2.1.1. Safety glazing shall be subjected to the tests listed in the following table:

Tests	Windscreens						Glasspanes Glass panes			
	Toughened glass		Ordinary laminated glass		Treated laminated glass		Glass-plastics	Toughened glass	Laminated-glass	Glass-plastics
	I	I-P	II	II-P	III	III-P	IV			
Fragmentation:	A4/2	A4/2	-	-	A8/4	A8/4	-	A5/2	-	-
Mechanical strength										
- 227 g ball	-	-	A6/4.3	A6/4.3	A6/4.3	A6/4.3	A6/4.3	A5/3.1	A7/3	A11/3
- 2,260 g ball	-	-	A6/4.2	A6/4.2	A6/4.2	A6/4.2	A6/4.2	-	<b>-A7/6<sup>4</sup></b>	-
Headform test <sup>1</sup>	A4/3	A4/3	A6/3	A6/3	A6/3	A6/3	A10/3	-	<b>-A7/6<sup>4</sup></b>	-
Abrasion										
Outer face	-	-	A6/5.1	A6/5.1	A6/5.1	A6/5.1	A6/5.1	-	A6/5.1	A6/5.1
Inner face	-	A9/2	-	A9/2	-	A9/2	A9/2	A9/2 <sup>2</sup>	A9/2 <sup>2</sup>	A9/2
High temperature	-	-	A3/5	A3/5	A3/5	A3/5	A3/5	-	A3/5	A3/5
Radiation	-	A3/6	A3/6	A3/6	A3/6	A3/6	A3/6	-	A3/6	A3/6
Humidity	-	A3/7	A3/7	A3/7	A3/7	A3/7	A3/7	A3/7 <sup>2</sup>	A3/7	A3/7
Light transmission	A3/9.1	A3/9.1	A3/9.1	A3/9.1	A3/9.1	A3/9.1	A3/9.1	A3/9.1	A3/9.1	A3/9.1
Optional distortion	A3/9.2	A3/9.2	A3/9.2	A3/9.2	A3/9.2	A3/9.2	A3/9.2	A3/9.2 <sup>3</sup>	-	-
Secondary image	A3/9.3	A3/9.3	A3/9.3	A3/9.3	A3/9.3	A3/9.3	A3/9.3	A3/9.3 <sup>3</sup>	-	-
Resistance to temperature changes	-	A3/8	-	A3/8	-	A3/8	A3/8	A3/8 <sup>2</sup>	A3/8 <sup>2</sup>	A3/8
Fire resistance	-	A3/10	-	A3/10	-	A3/10	A3/10	A3/10 <sup>2</sup>	A3/10 <sup>2</sup>	A3/10
Resistance to chemicals	-	A3/11.2.1	-	A3/11.2.1	-	A3/11.2.1	A3/11.2.1	A3/11.2.1 <sup>2</sup>	A3/11.2.1 <sup>2</sup>	A3/11.2.1

<sup>1</sup> Furthermore this test shall be carried out on multiple-glazed units pursuant to Annex 12, paragraph 3 (A12/3).

<sup>2</sup> If coated on the inner side with plastics material.

<sup>3</sup> This test shall only be carried out on uniformly-toughened glass-panes to be used as windscreens of slow-moving vehicles which, by construction, cannot exceed 40 km/h.

<sup>4</sup> **This test shall only be carried out on laminated-glass panes bearing the additional symbol /D.**

*Note:* A reference such as A4/3 in the table indicates the annex (4) and paragraph (3) of that annex, where the relevant test is described and the acceptance requirements are specified

*Annex 7*

*Insert new paragraph 6., to read:*

- "6. Additional tests for glass panes bearing the additional symbol /D**  
**The provisions concerning the 2,260 g ball test set out in Annex 6, paragraph 4.2., and the provisions concerning the headform test for laminated-glass panes set out in Annex 12, paragraph 3., shall apply to glass panes bearing the additional symbol /D."**

*Annex 23*

*Insert new paragraphs 2.4.6. to 2.4.6.2., to read:*

- "2.4.6. In the case of glass panes bearing the additional symbol /D**  
**2.4.6.1. 2,260 g ball test in accordance with the requirements of Annex 6, paragraph 4.2.**  
**2.4.6.2. Headform test in accordance with the requirements for laminated-glass panes of Annex 12, paragraph 3."**

## **II. Justification**

1. The proposal aims to amend UN Regulation No. 43 to enable the approval of the laminated-glass panes with improved mechanical properties. These panes are especially aimed for front, exterior, forward-facing glazing of the upper deck of a double-deck vehicle. Currently, a laminated-glass pane or a glass-plastic pane bearing the additional symbol "/A" can be used in these glazing. However, the use of the laminated windscreen is not possible for this purpose. In addition, the requirement for windscreens to have a regular light transmittance of at least 70 per cent is not relevant in this application. The mechanical strength test with 2,260 g ball and the headform test are mandatory for laminated windscreens. Laminated-glass pane fulfilling these two requirements would particularly improve the safety of the passengers in the front seats of the upper deck of a double-deck bus. Due to weight savings, many manufacturers want to use thinner laminated-glass panes than before. At motorway speeds, an object such as falling rock can penetrate a thin laminated-glass pane rather easily. The fulfilment of the 2,260 g ball test would help to prevent that. The fulfilment of the headform test would help avoiding head injuries in frontal collision. Thus, some bus manufacturers would like to use, in this application, a glass with similar mechanical properties as in laminated glass windscreen. Unfortunately, an approval of this kind of pane is not possible according to current requirements of UN Regulation No. 43. In addition, this mechanically improved laminated-glass pane could also be installed in other applications where the laminated-glass panes are used.

2. This proposal would amend Annex 7 (laminated-glass panes), inserting a new paragraph 6. to allow optional 2,260 g ball test and headform test for laminated-glass panes. The 2,260 g ball test would be the same as in Annex 6 (ordinary laminated glass windscreens). The 2,260 g ball test is performed in Annex 6 with square test pieces (300 mm × 300 mm), so it is also applicable with laminated-glass panes. The headform test would be the same as in Annex 12 (Multiple glazed units) for laminated-glass panes used in multiple glazing. In Annex 6 the headform test is made with complete windscreens, but in Annex 12 with rectangular test pieces

(1,100 mm × 500 mm). Thus, the test of Annex 12 was chosen. References to the new tests are added to the table in paragraph 8.2.1.1.

3. A new additional symbol "/D" in the approval mark would show that laminated-glass pane fulfils the requirements of both of the tests. The definition of the symbol "/D" is added to paragraph 5.5.8.

4. The new tests would also be added to the Annex 23 (conformity of production) inserting new paragraphs 2.4.6., 2.4.6.1., and 2.4.6.2.

5. There is no new mandatory installation provisions proposed to Annex 24 (provisions regarding the installation of safety glazing on vehicles). The new laminated-glass pane with additional symbol "/D" would only be an alternative to current laminated-glass panes. Thus, a new series of amendment or transitional provisions are not necessary. Nevertheless, mandatory installation provisions of this improved laminated-glass pane could be considered later.

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