

**Economic and Social Council**Distr.: General  
25 July 2016

Original: English

---

**Economic Commission for Europe****Inland Transport Committee****World Forum for Harmonization of Vehicle Regulations****Working Party on General Safety Provisions****111<sup>th</sup> session**

Geneva, 11–14 October 2016

Item 4 of the provisional agenda

**Regulation No. 43 (Safety glazing)****Proposal for Supplement 5 to the 01 series of amendments to Regulation No. 43 (Safety glazing)****Submitted by the expert from Germany\***

The text reproduced below was prepared by the expert from Germany to align the requirements for plastic panes, other than windscreens, to those for plastic pane windscreens. This includes amendments to rigid plastic panes, flexible plastic panes and rigid plastic multiple-glazed units. The modifications to the current text of UN Regulation No. 43 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.

# I. Proposal

Annex 14

Paragraph 1.1.6., amend to read:

"1.1.6. The nominal thickness. ... the acceptable thickness tolerance is given by equation (thickness tolerance limits (mm) =  $\pm (0.4 \text{ mm} + 0.1 e)$ )

Where e is the sheet **nominal** thickness in millimetres.

Reference standard is ISO ~~7823/1~~ **7823-1: 2003.**"

Insert a new paragraph 1.2.2., to read:

**"1.2.2. The incorporation or otherwise of opaque obscuration."**

Paragraph 4.2., amend to read (inserting also a new note <sup>1</sup>):

"4.2. Number of test pieces

Six flat test pieces (1,170 x 570 +0/-2 mm) or six complete parts shall be subjected to testing.

**The table below shows the type of samples subject to testing, in accordance with the dimensions of the glazing to be assessed.**

Type of window	Characteristic of window	Dimensions of flat sample	Alternative
Small window	Diameter D of the circle capable of being scribed: D < 150 mm	No test	
Other than small window	Diameter D of the circle capable of being scribed: 150 < D < 400 mm	1,170 mm x 570 mm (material type testing and standard support frame)	Other part of same material, production procedure, thickness, colour with dimensions bigger than those of the original part, into which a 400 mm diameter circle can be scribed, and with a developed surface area of less than 1,170 mm x 570 mm (part type approval for the original part <sup>1</sup> )
	Diameter D of the circle capable of being scribed: 400 mm < D	1,170 mm x 570 mm (material type testing and standard support frame)	Real part (submitted for approval) (part type approval and dedicated support frame)

**Note:** <sup>1</sup> **Original part dimensions are too small for performing the test."**

Paragraphs 4.3.2. and 4.3.3., amend to read:

"4.3.2. For **forward facing** glazing **situated forward of an occupant** like partitions and separating windows which have impact probability (classification VIII/A) the drop height shall be 3 m. The HIC value **shall** ~~is~~ also ~~to~~ be measured.

4.3.3. For glazing like side windows, back windows and sunroofs which have reduced impact possibilities (classification VIII/B) the drop height shall be 1.5 m. The HIC value **shall** ~~is~~ also ~~to~~ be measured."

*Paragraph 4.4.3.*, amend to read:

"4.4.3. A set of test pieces submitted for approval shall be considered satisfactory from the point of view of the headform test if ~~one of the following conditions is met:~~ **all tests give satisfactory results.**"

*Paragraphs 4.4.3.1. and 4.4.3.2.*, shall be deleted.

*Paragraph 5.1.*, amend to read:

"5.1. Indices of difficulty of the secondary characteristics:  
 (1) Without conductors, **obscuration(s)** or heating elements;  
 (2) With conductors, **obscuration(s)** or heating elements."

*Paragraph 5.2.*, amend to read:

"5.2. Number of test pieces  
 Ten flat square pieces **of** 300 mm +10/-0 mm **side** or ten substantially flat finished parts shall be subjected to testing. **In this later case, the contact between the part and the supporting fixture shall be around the whole perimeter and of about 15 mm width. Upper and lower supporting frames shall be clamped together in a way that ensures that the movement of the test piece during the test shall not exceed 2 mm.**"

*Paragraph 5.3.2.*, amend to read:

"5.3.2. The height of drop for the various **nominal** thickness values is given in ...  
 ...  
 For intermediate values of test piece **nominal** thickness ... be interpolated."

*Paragraphs 5.4.1. and 5.4.2.*, amend to read:

"5.4.1. The ball test shall be ...  
 (b) The test piece does not break into separate pieces.  
 As a result of the impact, cracks and fissures in the **test piece sheet** are however permissible.

5.4.2. A set of test pieces submitted for approval shall be considered satisfactory from the point of view of the 227 g ball test if ~~one of the following conditions is met:~~ **eight or more separate tests give a satisfactory result at the drop height.**"

*Paragraphs 5.4.2.1. and 5.4.2.2.*, shall be deleted.

*Insert a new paragraph 5.4.3.*, to read:

"**5.4.3. The ambient temperature ball drop test shall be only performed after the humidity test of paragraph 6.4.4. of this annex.**"

*Paragraphs 6.1.3.1. and 6.1.3.2.*, amend to read:

"6.1.3.1. In the case of glazing of class L, the abrasion test shall be considered to have given a satisfactory result if the **increase of haze** ~~total light scatter~~ after abrasion does not exceed 2 per cent after 1,000 cycles on the outer surface of the test piece and 4 per cent after 100 cycles on the inner surface of the test piece.

6.1.3.2. In the case of glazing of class M, the abrasion test shall be considered to have given a satisfactory result if the **increase of haze** ~~total light scatter~~ after abrasion does not exceed 10 per cent after 500 cycles on the outer surface of

the test piece and 4 per cent after 100 cycles on the inner surface of the test piece."

*Insert a new paragraph 6.1.3.3., to read:*

**"6.1.3.3. In the case of glazing of Class L, for the abrasion on the outer surface of the test sample, either the abrasion test according to Annex 3, paragraph 4. or as an equivalent alternative the package of sand drop test, car-wash test and wiper test shall apply as described in Annex 17, paragraphs 6.1.2., 6.1.3. and 6.1.4."**

*Paragraph 6.1.3.3. (former), renumber as paragraph 6.1.3.4.*

*Paragraphs 6.2.4., amend to read:*

"6.2.4. A set of test pieces submitted for approval shall be considered satisfactory from the point of view of the resistance to simulated weathering if ~~one of the following conditions is met:~~ **all test pieces give satisfactory results.**"

*Paragraphs 6.2.4.1. and 6.2.4.2., shall be deleted.*

*Paragraph 6.3.3.2., amend to read:*

"6.3.3.2. The test piece shall be considered satisfactory from the point of view of approval if ~~one of the following conditions is met:~~ **the test gives satisfactory results.**"

*Paragraphs 6.3.3.2.1. and 6.3.3.2.2., shall be deleted.*

*Paragraph 6.4.2., amend to read:*

"6.4.2. Ten flat square test pieces of 300 mm side **or ten original parts** shall be subjected to testing."

*Paragraph 7.1., amend to read:*

"7.1. Interpretation of results

A set of **four samples** ~~test pieces~~ shall be considered as satisfactory if ~~one of the following conditions is met:~~ **all samples give satisfactory results.**"

*Paragraphs 7.1.1. and 7.1.2., shall be deleted.*

*Paragraph 8.2.1., amend to read:*

"8.2.1. For the purpose of approval a set of samples will be considered satisfactory if ~~one of the following conditions is met:~~ **all samples give satisfactory results.**"

*Paragraphs 8.2.1.1. and 8.2.1.2., shall be deleted.*

*Paragraphs 9.1. to 9.2.2., amend to read:*

**"9.1. Immersion test**

**9.1.1. Indices of difficulty and test method**

**The requirements of Annex 3, paragraph 11.2.1., shall apply.**

**9.1.2. Interpretation of results**

**A set of four samples for each chemical shall be tested; for each chemical, in case of glazing of Class L, one of these samples shall be cross-cut according to paragraph 13. of Annex 3.**

**Three samples out of four, among which the cross-cut sample mentioned above when applicable, shall give satisfactory results for each chemical.**

**9.2. Test under load****9.2.1. Indices of difficulty and test method**

The requirements of Annex 3, paragraph 11.2.4. shall apply.

**9.2.2. Interpretation of results**

A set of four samples, not being the ones mentioned in paragraph 9.1. above, for each chemical shall be tested.

Three samples out of four shall give satisfactory results for each chemical."

*Annex 15*

*Paragraph 1.1.5.*, amend to read:

"1.1.5. The nominal thickness (e), a manufacturing tolerance being allowed:  $\pm (0.1 \text{ mm} + 0.1 e)$ ;  $\nless e > 0.1 \text{ mm}.$ "

*Paragraph 4.2.1.*, amend to read:

"4.2.1. Number of test pieces

Ten flat square pieces of 300 +10/-0 mm side shall be subjected to testing."

*Paragraph 4.2.3.2.*, amend to read:

"4.2.3.2. A set of test pieces submitted for approval shall be considered satisfactory from the point of view of the 227 g ball test if ~~one of the following conditions is met:~~ **eight or more separate tests give a satisfactory result at the drop height.**"

*Paragraphs 4.2.3.2.1. and 4.2.3.2.2.*, shall be deleted.

*Paragraph 5.1.4.*, amend to read:

"5.1.4. A set of test pieces or samples submitted for approval shall be considered satisfactory from the point of view of the resistance to simulated weathering if ~~one of the following conditions is met:~~ **all test pieces or samples give satisfactory results.**"

*Paragraphs 5.1.4.1. and 5.1.4.2.*, shall be deleted.

*Paragraph 6.1.*, amend to read:

"6.1. Interpretation of results

A set of **four** samples shall be considered as satisfactory if ~~one of the following conditions is met:~~ **all samples give satisfactory results.**"

*Paragraphs 6.1.1. and 6.1.2.*, shall be deleted.

*Paragraph 7.2.1.*, amend to read:

"7.2.1. For the purpose of approval a set of samples will be considered satisfactory if ~~one of the following conditions is met:~~ **all samples give satisfactory results.**"

*Paragraphs 7.2.1.1. and 7.2.1.2.*, shall be deleted.

*Paragraph 8.2.*, amend to read:

"8.2. Interpretation of results

A set of samples shall be considered acceptable if ~~one of the following conditions is met:~~ **all samples give satisfactory results.**"

Paragraphs 8.2.1. and 8.2.2., shall be deleted.

Annex 16

Paragraph 1.1.4., amend to read:

"1.1.4. The **nominal** thickness of the component sheets."

Paragraph 1.2.1., amend to read:

"1.2.1. **The incorporation or otherwise of opaque obscuration** ~~No secondary characteristic is involved.~~"

Paragraph 2.3., amend to read:

"2.3. The nominal .... by the equation:

$$\text{Thickness tolerance limits (mm)} = \pm (0.4 \text{ mm} + 0.1 \cdot e)$$

~~W~~where e is the sheet nominal thickness **in millimetres**.

Reference standard is ISO ~~7823/1~~ **7823-1: 2003**.

NB: Where ... of the unit."

Paragraph 4.2., amend to read (inserting also a new note <sup>1</sup>):

"4.2. Number of test pieces

~~Six representative windows of size 1,170 mm x 570 mm (+0/- 2 mm in both directions) shall be subjected to testing. The test pieces will have provision for peripheral clamping.~~

**Six flat test pieces (1,170 mm x 570 mm +0/-2 mm) or six complete parts shall be subjected to testing.**

**The table below shows the type of samples subject to testing, in accordance with the dimensions of the glazing to be assessed.**

Type of window	Characteristic of window	Dimensions of flat sample	Alternative
Small window	Diameter D of the circle capable of being scribed: D < 150 mm	No test	
Other than small window	Diameter D of the circle capable of being scribed: 150 < D < 400 mm	1,170 mm x 570 mm (material type testing and standard support frame)	Other part of same material, production procedure, thickness, colour with dimensions bigger than those of the original part, into which a 400 mm diameter circle can be scribed, and with a developed surface area of less than 1,170 mm x 570 mm (part type approval for the original part <sup>1</sup> )
	Diameter D of the circle capable of being scribed: 400 mm < D	1,170 mm x 570 mm (material type testing and standard support frame)	Real part (submitted for approval) (part type approval and dedicated support frame)

Note: <sup>1</sup> **Original part dimensions are too small for performing the test."**

*Paragraphs 4.3.1. to 4.3.3., amend to read:*

- "4.3.1. The test method used shall be that described in Annex 3, paragraph 3.2.  
~~Impact will be on the inner side of the window.~~
- 4.3.2. For **forward facing** glazing **situated forward of an occupant** like partitions and separating windows which have ~~high~~ impact probability (**classification X/A**) the drop height shall be 3 m.  
The HIC value ~~is~~ **shall** also ~~to~~ be measured.
- 4.3.3. For glazing like side windows, back windows and sunroofs which have reduced impact possibilities (**classification X/B**) the drop height shall be 1.5 m.  
The HIC value ~~is~~ **shall** also ~~to~~ be measured."

*Paragraphs 5.1. to 5.2., amend to read:*

- "5.1. Indices of difficulty of the secondary characteristics:  
~~No secondary characteristic is involved.~~  
**(1) Without obscuration(s)**  
**(2) With obscuration(s)**
- 5.2. Number of test pieces  
~~Ten flat test pieces of the outer component sheet or ten finished parts of size 300 mm x 300 mm (+10/ 0 mm) shall be subjected to testing.~~  
**Ten flat square pieces of 300 mm +10/-0 mm side of the outer component sheet or ten substantially flat finished parts shall be subjected to testing. In this later case, the contact between the part and the supporting fixture shall be around the whole perimeter and of about 15 mm width. Upper and lower supporting frames shall be clamped together in a way that ensures that the movement of the test piece during the test shall not exceed 2 mm."**

*Paragraph 5.3.2., amend to read:*

- "5.3.2. The height of drop for the various **nominal** thickness values of the outer component of the window is given in the ...  
...  
For intermediate values of **nominal** thickness ... shall be interpolated."

*Paragraphs 5.4.1. to 5.4.2., amend to read:*

- "5.4.1. The ball test shall be considered to have given a satisfactory result if the following conditions are met:  
(a) The ball does not penetrate the test piece  
(b) The test piece does not break into separate pieces.  
**As a result of the impact, cracks and fissures in the test piece shall however be permitted.**
- 5.4.2. A set of test pieces submitted for approval shall be considered satisfactory from the point of view of the 227 g ball test if ~~one of the following conditions is met:~~ **eight or more separate tests give a satisfactory result at the drop height."**

*Paragraphs 5.4.2.1. and 5.4.2.2., shall be deleted.*

Paragraph 6.1.2., amend to read:

"6.1.2. Three flat square test pieces of 100 mm **side** for each type of surface shall be subjected to testing."

Paragraphs 6.1.3.1. and 6.1.3.2., amend to read:

"6.1.3.1. In the case of glazing of class L, the abrasion test shall be considered to have given a satisfactory result if the **increase of haze** ~~total light scatter~~ after abrasion does not exceed 2 per cent after 1,000 cycles on the outer surface of the test sample and 4 per cent after 100 cycles on the inner surface of the test sample.

6.1.3.2. In the case of glazing of class M, the abrasion test shall be considered to have given a satisfactory result if the **increase of haze** ~~total light scatter~~ after abrasion does not exceed 10 per cent after 500 cycles on the outer surface of the test sample and 4 per cent after 100 cycles on the inner surface of the test sample."

Insert a new paragraph 6.1.3.3., to read:

"**6.1.3.3. In the case of glazing of Class L, for the abrasion on the outer surface of the test sample, either the abrasion test according to Annex 3, paragraph 4. or as an equivalent alternative the package of sand drop test, car-wash test and wiper test shall apply as described in Annex 17, paragraphs 6.1.2., 6.1.3. and 6.1.4.**"

Paragraph 6.1.3.3. (former), renumber as paragraph 6.1.3.4.

Paragraph 6.1.4., amend to read:

"6.1.4. A set of samples for approval shall be considered satisfactory if ~~one of the following conditions is met:~~ **all samples meet the requirements.**

~~(a) All samples meet the requirements or~~

~~(b) One sample having failed, a repeat of the tests on a new set of samples gives a satisfactory result."~~

Paragraph 6.2.4., amend to read:

"6.2.4. A set of test pieces submitted for approval shall be considered satisfactory from the point of view of the resistance to simulated weathering if ~~one of the following conditions is met:~~ **all test pieces give satisfactory results.**"

Paragraphs 6.2.4.1. and 6.2.4.2., shall be deleted.

Paragraph 6.3.3.2., amend to read:

"6.3.3.2. The test piece shall be considered satisfactory from the point of view of approval if ~~one of the following conditions is met:~~ **the test gives satisfactory results.**"

Paragraphs 6.3.3.2.1. and 6.3.3.2.2., shall be deleted.

Paragraph 6.4.2., amend to read:

"6.4.2. Ten square pieces or test windows of 300 x 300 mm **side or ten original parts** shall be subjected to testing."

Paragraph 7.1., amend to read:

"7.1. Interpretation of results

A set of **four** samples shall be considered as satisfactory if ~~one of the following conditions is met:~~ **all samples give satisfactory results."**



Paragraphs 7.1.1. and 7.1.2., shall be deleted.

Paragraph 8.2.1., amend to read:

"8.2.1. For the purpose of approval a set of samples will be considered satisfactory if ~~one of the following conditions is met:~~ **all samples give satisfactory results.**"

Paragraphs 8.2.1.1. and 8.2.1.2., shall be deleted.

Paragraphs 9.1. to 9.2.2., amend to read:

**9.1. Immersion test**

**9.1.1. Indices of difficulty and test method**

**The requirements of Annex 3, paragraph 11.2.1., shall apply.**

**9.1.2. Interpretation of results**

**A set of four samples for each chemical shall be tested; for each chemical, in case of glazing of Class L, one of these samples shall be cross-cut according to paragraph 13. of Annex 3.**

**Three samples out of four, among which the cross-cut sample mentioned above when applicable, shall give satisfactory results for each chemical.**

**9.2. Test under load**

**9.2.1. Indices of difficulty and test method**

**The requirements of Annex 3, paragraph 11.2.4., shall apply.**

**9.2.2. Interpretation of results**

**A set of four samples, not being the ones mentioned in paragraph 9.1. above, for each chemical shall be tested.**

**Three samples out of four shall give satisfactory results for each chemical."**

## II. Justification

The text reproduced below was prepared to align the requirements for plastic panes, other than windscreens, to the requirements of plastic pane windscreens. This includes amendments to rigid plastic panes, flexible plastic panes and rigid plastic multiple-glazed units. The modifications to this type of glazing in this document are in line with the requirements of Supplement 4 to the 01 series of amendment of UN Regulation No. 43.

---