

## Proposal for amendment to UN Regulation No. 43

This is based on the opinion of the Korean expert group for other glass panes - toughened glass and is a proposal for the amendment of the methodology of the 227g ball drop test for toughened glass. The modifications to the current text of the Regulation are marked in bold for new characters.

### I. Proposal

*Paragraph 2.1.*, amend to read:

"2.1. *"Toughened-glass"* means glazing consisting of a single layer of glass which has been subjected to special treatment to increase its mechanical strength **before toughened glass** and to condition its fragmentation after shattering."

*Annex 3, paragraphs 2.1.3. and 2.1.4.*, amend to read:

"2.1.3. Test piece

The test piece shall be a flat square of side  $300 + 10/-0$  mm or shall be cut from the ~~flattest~~ **weakest** part of a windscreen or other curved pane.

Alternatively a curved pane **or finished products** may be tested. In this case care shall be taken to ensure adequate contact between the safety glazing and the support.

2.1.4. Procedure

Condition the test piece at the specified temperature for at least four hours immediately preceding test.

Place the test piece in the fixture (paragraph 2.1.1.3.). The pane of the test piece shall be perpendicular, within  $3^\circ$ , to the incident direction of the ball.

In the case of flexible plastic glazing the test piece shall be clamped to the support.

The point of impact shall be within 25 mm of the ~~geometric center of the test piece~~ **center of the supported area** for a drop height less than or equal to 6 m, and within 50 mm of the ~~center of the test piece~~ **center of the supported area** for a drop height greater than 6 m. The ball shall strike that face for the test piece within represents the outside face of the safety glazing pane when mounted on the vehicle. The ball shall be allowed to make only one impact."

*Annex 5, paragraph 3.1.1., the table*, amend to read:

"3.1.1. Indices of difficulty of the secondary characteristics.

<i>Material</i>	<i>Index of difficulty</i>	<i>Colouring</i>	<i>Index of difficulty</i>	<i>Opaque obscuration</i>	<i>Index of difficulty</i>
Polished glass	2	colourless	1	<i>None Opaque</i>	<b>1</b>
Float glass	1	tinted	2	<i>Opaque</i>	<b>2</b>
Sheet glass	1				

The other secondary characteristic (namely, incorporation or otherwise of conductors) is not involved."

## II. Justification

1. Toughened glass has two important characteristics. For one, the strength against outside impact is three or four times higher than that of before toughened glass. Moreover, it has the characteristics of fine -- not sharp -- fragmentation when shattering occurs.

2. Thus, toughened glass is expected to have higher strength against outside impact (mechanical strength) than that of before toughened glass. So, if the mechanical strength of toughened glass becomes lower than that of before toughened glass because of ceramic print, the purpose and standards of regulating toughened glass cannot be met.

*Paragraph 2.1., amend to read:*

2.1. "Toughened-glass" means glazing consisting of a single layer of glass which has been subjected to special treatment to **increase its mechanical strength** and to condition its fragmentation after shattering."

3. If the ceramic printed area is essential for fixing toughened glass to automobiles, the range of the ceramic printed area should be limited to the minimum level. For the sake of appearance to enlarge the portion of the ceramic printed area in panoramic sunroofs, it will be necessary to restrict the ratio of the ceramic printed area for safe driving and consumer protection.

### **The addition of the phrase of "target of mechanical strength increase" in the definition of terms:**

(a) In the definition of terms, the target of mechanical strength increase is not defined; hence the need to add a specific phrase, e.g., the mechanical strength of toughened glass should be greater than that of before toughened glass.

(b) Adaptation of FMVSS 205 (ANSI/SAE Z 26.1 1996)

### **Need to harmonize 227g Ball Drop Point:**

(a) Need to shift the focus from test sample-oriented to supported area-oriented to satisfy test conditions of the test sample and finished product

(b) Need to harmonize UN GRT Paragraph No. 6 and Content:

*Paragraph 6.3.2.3., amend to read:*

"6.3.2.3. The point of impact shall be within 25 mm of **the center of supported area** from a drop height less than 6 m and within 50 mm of the center of supported area from a drop height greater than 6 m."

### **Need to insert "Opaque Obscuration" in the indices of difficulty of the secondary characteristics table:**

(a) [1.2.4. The incorporation or otherwise of opaque obscuration] defines "obscuration" but "Opaque Obscuration" is not indicated on the 'the Indices of difficulty of the secondary characteristics table.

(b) As mechanical strength varies according to the opaque obscuration status, "Opaque" must be inserted in the secondary characteristic table.

## Annex - Comparison of UN GTR and UN Regulation

Title	UN GTR No. 6	UN Regulation No. 43 (Rev.3)																
Legislation & amendment	May 16, 2008 (legislated)	Feb. 15,1981 (legislated), Sept. 29, 2012 (UN GTR)																
Definition of type	-	1. Definition of type Uniformly-toughened glass panes <b><u>shall be deemed to belong to different types</u></b> if they differ in at least one of the following <b><u>principal or secondary characteristics.</u></b>																
Secondary characteristics	-	3.1. 227g ball test 3.1.1. Indices of difficulty of the secondary characteristics. <table border="1" data-bbox="927 741 1437 1048"> <thead> <tr> <th>Material</th> <th>Index of difficulty</th> <th>Colouring</th> <th>Index of difficulty</th> </tr> </thead> <tbody> <tr> <td>Polished glass</td> <td>2</td> <td>colourless</td> <td>1</td> </tr> <tr> <td>Float glass</td> <td>1</td> <td>tinted</td> <td>2</td> </tr> <tr> <td>Sheet glass</td> <td>1</td> <td></td> <td></td> </tr> </tbody> </table> The other secondary characteristic ( <b><u>namely, incorporation or otherwise of conductors</u></b> ) is <b><u>not involved.</u></b>	Material	Index of difficulty	Colouring	Index of difficulty	Polished glass	2	colourless	1	Float glass	1	tinted	2	Sheet glass	1		
Material	Index of difficulty	Colouring	Index of difficulty															
Polished glass	2	colourless	1															
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Definition of toughened glass	3.3.7. <b><u>Uniformly toughened -glass</u></b> : means glazing consisting of a single layer of glass which has been subjected to special treatment <b><u>to increase its mechanical strength</u></b> and to condition its fragmentation after shattering.	2.1. " <i>Toughened-glass</i> " means glazing consisting of a single layer of glass which has been subjected to special treatment <b><u>to increase its mechanical strength</u></b> and to condition its fragmentation after shattering.																
Test pieces	6.3.4.1. The test pieces shall be flat samples measuring 300 x 300 mm, <b><u>pecially made or cut</u></b> from the flat test part of a windscreen or pane. 6.3.4.2. Test pieces <b><u>can alternatively be finished products</u></b> that may be supported over the apparatus described in paragraph 6.3.1. 6.3.4.3. If the test pieces are curved, care should be taken to ensure adequate contact with the support.	2.1.3. Test piece The test piece shall be a flat square of side <b><u>300 + 10/-0 mm or shall be cut from the flattest part</u></b> of a windscreen or other curved pane. Alternatively a curved pane may be tested. In this case care shall be taken to ensure adequate contact between the safety glazing and the support.																
Point of impact	6.3.2.3. The point of impact shall be within 25 mm of <b><u>the centre of the supported area</u></b> for a drop height less than or equal to 6 m, and within 50 mm of the center of the supported area for a drop height greater than 6 m.	2.1.4. Procedure ~ The point of impact shall be within 25mm of <b><u>the geometric center of the test piece</u></b> for a drop height less than or equal to 6m, ~																