

## Proposal for an amendment to UN GTR No. 6

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

#### B. TEXT OF REGULATION

Paragraph 3.3.7., amend to read:

"3.3.7. Uniformly 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."

Paragraphs 6.3.4.1. and 6.3.4.3., amend to read:

"6.3.4. Test pieces

6.3.4.1. The test pieces shall be flat samples measuring 300 x 300 mm, specially made or cut from the ~~flattest~~ **weakest** part of a windscreen or pane.

6.3.4.2. Test pieces can alternatively be finished products 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.

**6.3.4.4. It is possible to exclude from the list of test items the conductor installed to secure the driver's field vision."**

### II. Justification

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.

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.

<Definition>

3.3.7. Uniformly 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.

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.

**Adding the phrase of target of mechanical strength increase in the definition of terms**

1. 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.
2. Adaptation of FMVSS 205 (ANSI/SAE Z 26.1 1996)

**Necessity of regulation on the fragile ceramic printed area of toughened glass**

1. Prohibition on the installation of ceramic printed area weaker than before toughened glass
2. Toughened glass means a single layer of glass that has been subjected to special treatment to increase its mechanical strength and to condition its fragmentation after shattering.
3. Roughly speaking, the mechanical strength of toughened glass should be increased; according to the test results, however, the ceramic printed area of toughened glass has lower strength than that of before toughened glass (test result attached).

<GTR 6>

3.3.7. Uniformly 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.

4. Test conditions: Toughened glass
  - Test pieces: Should be manufactured using the same processes and materials used in manufacturing finished products and may be tested in the form of service parts or field state in case of difficulty in producing separate test pieces
  - If toughened glass has other characteristics like ceramic printed area: Need to make test pieces from the weaker part of glass preferentially and with respect to each characteristic according to the ratio of surface range
  - In case of test using a finished product: Should impact the center of the supported area

**Requirement for excluding from the list of test items safety devices like conductors (GTR)**

1. According to UN R 43, it is possible to exclude from the list of test items safety devices such as conductors installed in the rear window glass to secure the driver's field vision, but GTR 6 has no relevant provisions.
2. Excluded item: conductors installed in the rear window glass to secure the driver's field vision

<Attachment: Comparison of Regulations>

| Title                                | GTR-6   | UN Regulation No. 43 (Rev.3)  |                     |                     |           |                     |                |   |            |   |             |   |        |   |             |   |  |  |
|--------------------------------------|---|---|---------------------|---------------------|-----------|---------------------|----------------|---|------------|---|-------------|---|--------|---|-------------|---|--|--|
| <b>Legislation &amp; amendment</b>   | May 16, 2008 (legislated)   | Feb. 15,1981 (legislated), Sept. 29, 2012 (GTR)   |                     |                     |           |                     |                |   |            |   |             |   |        |   |             |   |  |  |
| <b>Definition of type</b>            | -   | 1. Definition of type<br>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> .  |                     |                     |           |                     |                |   |            |   |             |   |        |   |             |   |  |  |
| <b>Secondary characteristics</b>     | -   | 3.1. 227g ball test<br>3.1.1. Indices of difficulty of the secondary characteristics.<br><table border="1" data-bbox="898 737 1446 978"> <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                   |                     |           |                     |                |   |            |   |             |   |        |   |             |   |  |  |
| Float glass                          | 1   | tinted  | 2                   |                     |           |                     |                |   |            |   |             |   |        |   |             |   |  |  |
| Sheet glass                          | 1   |   |                     |                     |           |                     |                |   |            |   |             |   |        |   |             |   |  |  |
| <b>Definition of toughened glass</b> | 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.  |                     |                     |           |                     |                |   |            |   |             |   |        |   |             |   |  |  |
| <b>Test pieces</b>                   | 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.<br>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.<br>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<br>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.<br>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.  |                     |                     |           |                     |                |   |            |   |             |   |        |   |             |   |  |  |
| <b>Point of impact</b>               | 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 centre of the supported area for a drop height greater than 6 m.  | 2.1.4. Procedure<br>~<br>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, ~   |                     |                     |           |                     |                |   |            |   |             |   |        |   |             |   |  |  |

