

Transmitted by the expert from India

INDIA'S VIEWS ON THE INFORMAL DOCUMENT NO. GRSG -94-02

Note: The text reproduced below was prepared by the expert from India in order to represent views on the proposal (Informal Doc. GRSG-94-02) by expert from the EC to allow the fitting of bonded laminated glazing for side windows of category M3 Class III vehicles, single- & double-deckers.

A. BACKGROUND

Proposal by the expert from the European Commission as per Informal Document No. GRSG-94-02 is as given below:

At 94th GRSG Session, the expert from the European Commission (EC) introduced GRSG-94-02 & announced a formal proposal for a further session covering all aspects related to service doors, windows and emergency exits, including the use of laminated safety glazing to avoid passenger's ejection in the case of rollover.

B ARGUMENTS

While accepting the views of the expert of European Commission to allow the use of laminated glazing instead of tempered glazing for side windows of category M3 Class III vehicles (single- and double-deckers), India wishes to raise some aspects such as requirement for rapid evacuation of passengers, Passenger ejection due to window installation system failure, tropical climatic conditions etc.

a) Evacuation of passengers under emergency situation when trapped in buses involved in accidents

Rapid evacuation of buses is important in following bus accident types in order to protect lives of the passengers trapped.

- Fire in buses
- Submerged / Drowned bus under water

However, following difficulties can exist when the evacuation of passengers takes place through windows with laminated side glazing in aforesaid accident types,

- The needed time for the evacuation through laminated glazing is too long
- It causes serious head & facial injuries
- If a vehicle equipped with laminated glass is burning, exposure to initial heat and flames will discolor the glass hindering the visibility & developing the panic situations

In the cases of accidents of fires in buses, broken windows with tempered glazing also provide the escape for deposited smoke, poisoning gases & avoid suffocation.

b) Durability in Tropical Climatic Conditions

Among all weather conditions, tropical climate is specifically characterized by constant high temperature & humidity all twelve months of the year. Such climate covers the largest area of the Earth. As explained below, these climatic conditions also lead to use suitable type of glazing on side windows & also to use proper window installation type i.e either fixed glazing or sliding glazing / moveable frame. Due to tropical & subtropical climatic conditions, the bus passengers have to keep the windows in open condition for better comfort & air circulation. Use of AC bus coaches in India is very limited.

Tempered glazing in tropical climatic conditions offers good performance & durability as compared to use of laminated glazing.

c) Passenger ejection & bus structural deformation level in rollover

The purpose of retaining passengers inside the bus compartment in rollover with the use of laminated glazing on side windows will be fulfilled if the structural deformation is in small range i.e. the bus superstructure is strong enough. However, in cases of large bus structural deformation in case of rollover, the more important would be to protect passengers from the serious injury due to intrusion of vehicle parts & not the ejection through the windows. So, the ejection of passengers in rollover can also be linked to the bus structural deformation level.

d) Passenger ejection due to window installation system failure

It has also been experienced that the ejection in rollover is also dependent on the window installation systems such as windows installed with rubber profile into the steel frame of the bus, windows glued to the steel frame etc. Hence, India feels that the development of proper window installation system can also be considered as an important factor.

e) Others

In addition to aforesaid points, some optimistic safety characteristics of tempered glazing are listed below:

- Tempered glazing are extremely strong (five times as strong as ordinary glass)
- Offers high resistance against impact & thermal stresses
- Effectively resists wind pressure
- It has more resistance to rapid changes in temperature
- As compared to Laminated glazing, temper glazing has less weight which helps in reducing the overall vehicle weight & also to bring subsequent advantages
- Tempered glazing are inexpensive in comparison to laminated glazing & therefore use of tempered glazing also facilitate cost saving.
- Tempered glazing could be shaped into the designs vehicle manufacturers wanted.
- Ensures continued performance throughout the life of the vehicle

Therefore, the India suggests to consider above points for discussion at GRSG while deciding the fitting of bonded laminated glazing for side- windows of M3, Class III vehicles.
