

Some examples were shared within the group of different possible means to break the window.

- https://sc01.alicdn.com/kf/HTB1sVG6k5OYBuNjSsD4q6zSkFXaC/200462596/HTB1sVG6k5OYBuNjSsD4q6zSkFXaC.jpg_.webp
- https://www.alibaba.com/product-detail/Car-safety-products-Emergency-window-breaking_60174352570.html
- <https://www.yankodesign.com/2013/10/03/in-case-of-emergency-smash-the-glass/>
- Presentation shared by Renault from Brazilian alternative (BMFE-11-02)
- Presentation shared by Scania from alternative used in Sweden (BMFE-11-04)

The remark was given during the first part of the meeting that a device must be reliable under all circumstances. So also when electricity shuts down it must always be operable. These pass/fail criteria should be put into the homologation testing of the devices. We should keep in mind that the devices must be as technology neutral as possible.

Discussion regarding principle #1 ‘better localisation’

The group agreed to support this approach.

The localisation of the device must be well defined, to be easy visible for everyone.

In trains a red dot in a ceramic area is used to show where to hit the glass. More info on this topic will be shared during the next BMFE meeting in December.

Safety signs can also be used to show the position of the device, already for emergency door release (see 7.6.11 from Annex 3 of R107).

A demonstration/justification by OEM on how he defined the location could be a good way to implement this principle in the regulation.

Discussion regarding principle #2 ‘better visibility’

- [Alert \(Flash or light\) to help locate the device](#)

A comment to the first point (a flash or light) is that this is again an electrical solution. Another possible solution could be a permanent marking in for instance red.

It was also discussed within the group that we should look at the current provisions for emergency lighting and markings according to the 06 series of amendments (markings for emergency doors). Maybe the emergency lighting gives enough light to see the glass breaking devices. It might however be possible that it will not give enough visibility, so further investigation is needed.

In the 06 series of R107 the provisions for safety signs in point 7.6.11.3 --> 7.6.11.8 (Annex 3) were already introduced, for the next session this will be further investigated.

No consensus reached at this time within the group to know if additional identification means should be required.

- [Activation by alarm system and possible driver deactivation](#)

It was discussed that it is not necessary to make the system too complex. On the other hand an accidental

activation must also be avoided. A way to only prevent a non intentional activation should be implemented in the regulation.

Discussion regarding principle #3 'Easier to use'

A device must be able to be operated by a simple action. It must not be necessarily a single action, as long as it is simple it is ok. A level of force to operate might be necessary to define, all sorts of passengers must be able to operate the device. The device must be robust and reliable and more efficient than the current hammer. As a first approach, the only pass/fail criteria needed is the break of the concerned glass.

Within the group it was agreed to look at the different sorts of devices already on the market and to look at their effectiveness. Some devices might not be enough to break double glass panes in one action.

Within the FMVSS in the US, 2 actions are described, the first one to 'unlock' the system, the second one to 'break' the glass.

(FMVSS 217: <http://www.unece.org/fileadmin/DAM/trans/doc/2010/wp29grsg/SDWEE-03-07e.pdf>)

If we break the glass effectively, should we not define something to also eject the glass effectively and without too much force? A film on the inside pane could help, but we must keep in mind that the film might influence the burning behaviour/flammability. To look at R43 for (plastic) safety glazing and R118 for fire resistance and test methods.

The group agreed to focus first on the way to improve efficiency on the glass breaking first but glass ejection facilitation could be kept at the agenda for discussion.

Discussion regarding the different alternatives showed during the meeting.

In general we must look at all alternatives we can find on the market today before coming to a conclusion for the best system to use. So for the next meeting the different experts will look for more alternatives.

Push device (AliBaba)

- https://sc01.alicdn.com/kf/HTB1sVG6k5OYBuNjSsD4q6zSkFXaC/200462596/HTB1sVG6k5OYBuNjSsD4q6zSkFXaC.jpg_.webp
- https://www.alibaba.com/product-detail/Car-safety-products-Emergency-window-breaking_60174352570.html

Probably not the best solution to avoid misuse, only need to turn and then hit it... But simple and easy to use without electrical wiring or other technologies.

Safe-T Push device (Scania) (BMFE-11-04)

Device offered by Scania, also simple and easy to use. Already a bit more protected against misuse. To use it, a plastic safety seal must be broken first. All people (young, old, injured) can operate it.

It was questioned if the device is efficient enough to break double glazed windows easily. If the outside

pane is not broken, the device cannot be used anymore. More evaluation is needed before implementing requirements into the regulation. But it is necessary to break both panels in 1 action! Efficiency and functioning need to be defined.

Push out device from Brazil (BMFE-11-02) (link video https://youtu.be/dphUPIZ_mPI?t=554)

Different regulations exist for M2 and M3 buses. The main system is federally regulated in Brazil and is the hammer. As an alternative another safety device of equivalent function may be used.

This can be a lever to push the window out which is used in some states.

The windows are not glued in this case, but are mounted in rubbers. In this situation different actions are needed, the levers need to be operated and then the window is pushed out. It is also used for school buses and public transportation. Can it be operated by children?

In general it is a simple and easy to use solution, but only for windows that are not glued but in rubbers.

American study on emergency exits measurements for school buses:
<https://nasdpts24.wildapricot.org/resources/Pictures/NASDPTS-Sunday-EvacuationStudyPresentation.pdf>

Escape Shot

- <https://www.yankodesign.com/2013/10/03/in-case-of-emergency-smash-the-glass/>

This system is a handle that is placed as a seat handle. In case of emergency you get it out of its position, place it on the window with suction cups, and then 'load' it, by pulling it back and releasing it.

Simple and easy to use solution, but will it break double glazed windows?

For all systems efficiency requirements need to be defined to be sure they do reach the goal we seek to arrive to (breaking single or double panes with a simple action).

Summary for the 3 principles:

More investigation needed.

- Non-intentional activation must be avoided.
- Not design restrictive
- System reliable
- Simple action(s) to break all layers
- Force under a certain limit (if needed to specify)
- Justification for adapted location
- Window ejection as a following step, after breaking the window

5.3. Draft amendment construction axis

- /

6. Regulation No.118 – Smoke toxicity : development of a simplified method for interior materials

Postponed to the next BMFE Session (BMFE 12)

6.1. Status of study progress [BAM]

6.2. Material targeted and relevant results sharing [BAM]

7. Next steps and meetings

Actions to take for the next session BMFE 12:

- Principle #1 ‘location’:
 - Input from Bo Nillson (SWE) from trains location (red dot/ceramic area)
 - Input from all experts for a generic way to collect info from alternative systems + input if they will fulfil or not.
- Principle #2 ‘visibility’
 - Input from Michael Becker regarding the 06 series of amendments regarding emergency lighting)
 - Input from all experts regarding specific identifications for improvement of the visibility of the device (additional mean needed).
- Principle #3 ‘Easier to use’
 - Input on different solutions already available, associated force level and effectiveness.
 - Reflection about glass ejection
- First draft proposal from France for implementation in regulation
- Input on R118 toxicity and test methods (studies BAM)

NEXT SESSION: BMFE-12

01/12/2020: 14:00 – 16:00 hrs

02/12/2020: 14:00 – 16:00 hrs

8. A.O.B.

PLEASE SEND YOUR DOCUMENTS before 27th NOVEMBER for BMFE 12

to kevin.deridder@agoria.be and fabrice.herveleu@utacceram.com