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INTRODUCTION

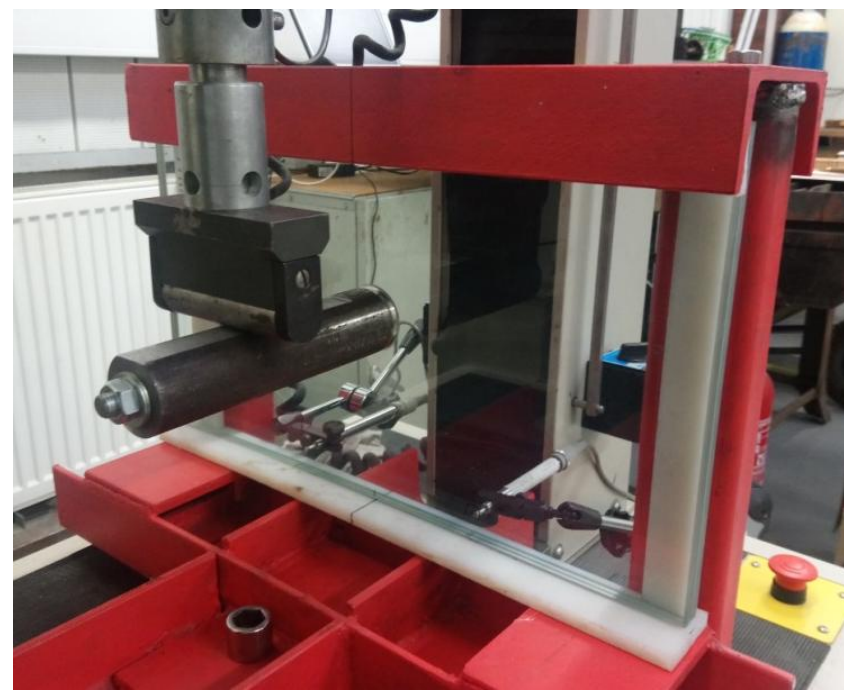
Laminated connection belongs to the most progressive ways of glass components connecting. Despite being widely used, the design procedure is mostly based on experiments. Within the ongoing research at the Faculty of Civil Engineering of CTU in Prague, two series of small scale experiments focusing on characteristics of the embedded laminated connection under the short-term tensile and eccentric shear loads were performed.

TESTING PROCEDURE

For both sets of samples, the testing process:

- included numerous loading and unloading cycles;
- after each increase or decrease cycle, the load was kept on a constant value for 1 minute;
- the load was cyclically increasing until the collapse.

A special frame with detachable bottom part was used to apply the tensile load. The samples were placed on a steel bed with two cylindrical supports and plastic pads.



For the eccentric shear load tests, the glass pane was vertically clamped to a steel frame with a detachable upper part. To create the eccentric shear force load, a special steel tool was put on the bolt screwed in the steel element.

CONCLUSION

The experiment revealed the dominant mode of failure and described the behaviour of this fixing system under two different types of loading. However, further research consisting of full scale tests and numerical modelling should be performed.

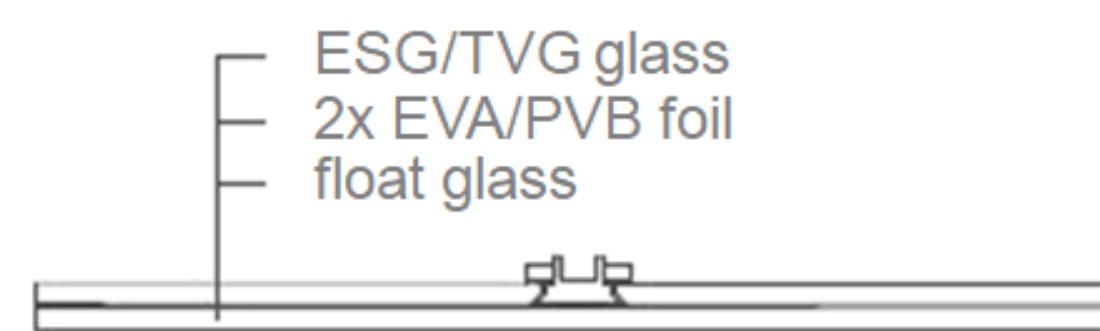
ACKNOWLEDGEMENTS

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DESCRIPTION OF THE SAMPLES

Laminated connection:

- the same manufacturing process as for the standard laminated glass panes;
- combines mechanical and adhesive systems;
- the steel element (bolt) is embedded between two glass panes;
- the adhesive interlayer is represented by two layers of foil.



All the samples were checked before the experiment. Defects do not influence the performance of the connection, but they might be unacceptable for the aesthetical reasons.

The samples may suffer from:

- bubbles surrounding the edges of the steel element;
- bigger bubbles in the area of the steel element;
- combination.



COURSE OF THE TESTS

The course of both types of tests was essentially the same:

1. Small bubbles appeared in the area of the connection.
2. Their number was increasing with the increasing load.
3. After reaching a certain point, they started to merge into bigger bubbles.
4. The bubbles eventually covered the whole area of the connection exposed to tension.
5. In some cases, bubbles appeared out of the connection as well.
6. The connection failed due to reaching the tensile resistance limit of the glass pane. No delamination occurred.

