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The influence of stress on double-glass components

Overview

What is the stress distribution through the thickness of glass?

Stress distribution through thickness The stress distribution through the thickness of glass is characterized with a zone of compression stress at the surface and a tension stress in the core of the glass pane. A comparison of a fully tempered and a chemically pre-stressed glass is shown in figure 2.

How does glass reduce stress?

To achieve a relaxation of stresses, the glass requires a homogeneous heating of the entire component so that stress can be released through the plastic behaviour of the heated material. The cooling through the transformation phase of the glass has to be slow enough to avoid further stress being locked in.

Does temperature affect the residual stress of glass specimen?

Conclusion Temperature impact on the residual stress of glass specimen is shown in the results obtained through experimental testing of borosilicate specimen. The importance of an additional annealing process can be observed, as residual stress is clearly reduced.

Is stress sufficiently eased out for thermal treatment of glass?

It is assumed that stress is sufficiently eased out for the glass to undergo further thermal treatment processes, however, this shall be verified in further tests. For application in an industrial process, controlled heating, temperature exposure at Tmax and controlled cooling would require further optimisation and study.

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The influence of rotational stiffness on the resulting static values may therefore vary. In the analyzed examples, this influence was primarily negative for symmetrical loads and clearly ...

This study examines the thermal performance impact of center-of-glass (COG) deflections in double- and triple-pane insulating glass ...

The problem of static values in IGUs (both double- and multi-glazed) is well known. The

literature describes relevant analytical models. ...

Influence of component glass panes thickness on: a) deflection, b) stress, in an exemplary unit loaded with increase of atmospheric pressure by 3 kPa.

COMSOL Multiphysics results showing the stress distribution and maximum stress (von Mises) of double-lap shear specimens, before and after adhesive failure between glass ...

This study examines the thermal performance impact of center-of-glass (COG) deflections in double- and triple-pane insulating glass units (IGUs) installed at several ...

However, it turns out that sealing the cavities in IGUs has a certain side effect. Under the influence of climatic factors, the gas entrapped in the gap changes its parameters, ...

The visual assessment of stress shows, that a controlled annealing process, reduces stress induced through a welding process/ heat impact can be relaxed and components do not show ...

The influence of elastic support of component glass panes on deflection and stress in insulating glass units is analysed in this paper. An analytical model is developed and ...

The residual stress of the tempered plate glass under symmetric boundary conditions was analyzed by Kong et al. [17] with the improved numerical methods. Chen et al. ...

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The relative magnitude and statistics of the strain components depend both on the symmetry of the driving stress (e.g., shear vs.~hydrostatic tension) and on the cohesive ...

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