Finite Element Implementation of a Glass Tempering Model in Three Dimensions

Finite Element Implementation of a Glass Tempering Model in Three Dimensions

The present paper develops and validates a 3D model for the simulation of glass tempering. It is assembled from well-known models of temperature dependent viscoelasticity and structural relaxation and predicts both transient and steady-state stresses in complex 3D glass geometries. The theory and implementation of the model is comprehensively given and the model is carefully checked and validated. It is demonstrated that by adjusting a single parameter in the model, experimental results can be replicated accurately even for cooling rates far from normal.

General information
Publication status: Published
Organisations: Section for Structural Engineering, Department of Civil Engineering
Contributors: Nielsen, J. H., Olesen, J. F., Poulsen, P. N., Stang, H.
Pages: 963-972
Publication date: 2010
Peer-reviewed: Yes

Publication information
Journal: Computers & Structures
Volume: 88
Issue number: 17-18
ISSN (Print): 0045-7949
Ratings:
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.365 SNIP 2.486
Web of Science (2010): Impact factor 1.722
Web of Science (2010): Indexed yes
Original language: English
Keywords: Strength of tempered glass, Thermorheological simple material, Structural relaxation, Residual stresses, Soda-lime-silica glass, Toughened glass
DOIs:
10.1016/j.compstruc.2010.05.004
Source: orbit
Source ID: 228542
Research output: Contribution to journal › Journal article – Annual report year: 2010 › Research › peer-review