



Aalborg Universitet

AALBORG UNIVERSITY  
DENMARK

## Dependence of Glass Mechanical Properties on Thermal and Pressure History

Smedskjær, Morten Mattrup; Bauchy, Mathieu

*Publication date:*  
2014

*Document Version*  
Early version, also known as pre-print

[Link to publication from Aalborg University](#)

*Citation for published version (APA):*  
Smedskjær, M. M., & Bauchy, M. (2014). Dependence of Glass Mechanical Properties on Thermal and Pressure History. Abstract from 6th International Workshop on Flow and Fracture of Advanced Glasses, Weimar, Germany.

### General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- ? Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- ? You may not further distribute the material or use it for any profit-making activity or commercial gain
- ? You may freely distribute the URL identifying the publication in the public portal ?

### Take down policy

If you believe that this document breaches copyright please contact us at [vbn@aub.aau.dk](mailto:vbn@aub.aau.dk) providing details, and we will remove access to the work immediately and investigate your claim.

# **Dependence of Glass Mechanical Properties on Thermal and Pressure History**

Morten M. Smedskjaer<sup>1</sup>, Mathieu Bauchy<sup>2</sup>

*<sup>1</sup>Section of Chemistry, Aalborg University, DK-9000 Aalborg, Denmark*

*<sup>2</sup>Department of Civil and Environmental Engineering, University of California, Los Angeles, USA*

Predicting the properties of new glasses prior to manufacturing is a topic attracting great industrial and scientific interest. Mechanical properties are currently of particular interest given the increasing demand for stronger, thinner, and more flexible glasses in recent years. However, as a non-equilibrium material, the structure and properties of glass depend not only on its composition, but also on its thermal and pressure histories. Here we review our recent findings regarding the thermal and pressure history dependence of indentation-derived mechanical properties of oxide glasses. We also demonstrate how a combined ion-exchange and isostatic compression approach can be applied to tailor the surface properties of alkali-containing glasses.