

Annealing, Tempering

Introductory training

duration
1 day

date
March 24

location
Eindhoven and/or Online

The mechanical properties of glass are of vital importance for many applications. Bottles must withstand internal pressure; architectural and automotive glazing must break in a safe way; ovenware must endure brutal temperature shocks; plane windshields must resist high-speed collisions with birds. This training provides key information to understand the ways to improve the strength of glass products.

Contents

- Glass composition (soda-lime, borosilicate, crystal) and atomic structure
- From structure to Young's modulus and thermal expansion coefficient
- The key role of glass surface condition
- Thermal shock resistance
- Relaxing stress : annealing
- Tailoring stress : heat strengthening and tempering
- Special glasses and chemical tempering

Training methods

We offer a blended learning approach by mixing e-learning, lectures, open discussions, exercises, and case studies in teams or individually. The number of participants per course is between 8 and 20 to maximize your learning experience. Participants always receive the presentations and a training certificate.

Level of seniority

This training is meant for novice to advanced beginners who would like to improve their understanding and apply the knowledge during practical cases.

Investment

Training costs **€ 950** per participant. When onsite, price includes lunche and refreshments. It excludes tax and duties. The 6th participant from the same company can join for free.

After the training

- You know why different glass types have different properties.
- You understand why it is important to take care of the surface of glass products.
- You can estimate the thermal shock resistance of a glass piece.
- You can calculate a theoretical annealing schedule to optimize glass relaxation.
- You understand how tempering plays with stress and improves the mechanical resistance of glass.

Cancellation fees apply. 1 week before training 50%; no show, full price. In case of an unexpected event, we are happy to look for rescheduling or voucher options. CelSian reserves the right to cancel up to two weeks prior to the training, proposing new dates or refunds. Are you registering as a group? You are entitled to a 15% discount on all courses: for 5 registrations, the 6th participant can join for free.



We welcome your questions by e-mail: academy@celsian.nl Register on www.celsian.nl

Online access to this training can be offered and the training may be fully given online.