

# Refractory selection, maintenance and related defects - Introductory training

duration  
2 days

date  
2 – 3 November 2021

location  
Eindhoven, The Netherlands

The refractory materials used in industrial melting furnaces are a huge investment for the glass manufacturer. Choosing the correct refractories is key in improving the furnace lifetime, reducing the energy costs, and reducing the refractory related defects. The course will provide you with insight into why different parts of the furnace, including melter, refiner, working end/forehearth channels and regenerator chambers, require different refractory types with specific chemistry and properties. The course will also provide you with some maintenance techniques that can be used to increase the furnace lifetime and reduce the risk of refractory failures.

## Contents

- Key refractories, requirements and properties
- Interaction mechanisms of refractories in contact with the glass melt and in contact with flue gases
- Refractory testing and on-line monitoring techniques
- Preventive maintenance of furnace structure
- Corrective maintenance and hot repair of furnace structure
- Identifying and understanding refractory related solid defects and cords

## 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 10 and 25 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 € 1,950 per participant, € 1,800 for each extra participant per company. Price includes 2 lunches and 1 dinner. It excludes accommodation, travelling, tax and duties.

## After the training

- You have an overview of the refractory types for different parts of furnaces and the purpose of their use.
- You understand the corrosion mechanisms of refractories in contact with the glass melt, at the crown and in the regenerators.
- You understand the defect types that can originate from different refractories in the furnace.
- You have knowledge of techniques for testing, monitoring and controlling the thickness of refractory walls. You will have some techniques for preventive and corrective maintenance of the furnace structure.

We do our best to ensure that the events take place. However, Celsian reserves the right to cancel up to two weeks prior to the training, proposing new dates or refunds. Cancellation fees apply from 4 weeks before the event: more than 4 weeks before training free of charge, less than 1 week before training 50%; otherwise full price. In case of an unexpected event, we are happy to look for a voucher solution for future courses.



We welcome your questions by e-mail: [academy@celsian.nl](mailto:academy@celsian.nl) Register on [www.celsian.nl](http://www.celsian.nl)

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