Heat transfer in glass melting furnaces
Advanced training

duration	date	location
1 day	12 October 2021	Eindhoven, The Netherlands

This training describes the fundamentals of heat transfer mechanisms in the combustion space, batch blanket and glass melt. It focusses on radiative heat transfer in glass melts depending on the presence of the colouring ions and the redox state of the melt. The effects of new, emerging, sustainable furnace technologies, like hydrogen combustion and full electric melting on the heat transfer mechanisms are elucidated.

Contents

- Heat transfer in the combustion space:
  - Flame emissivity
  - 1D model
  - Effect of soot
  - H2-rich flames
- Heat penetration in batch:
  - In flame furnaces
  - In electric cold-top furnaces
- Effect of cullet type and content
- Heat transfer in glass melt
- Radiative heat transfer using a new model for predicting thermal radiation conductivity
- Convection in fuel-fired and electric cold top tanks.

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 for advanced beginners to skilled professionals willing to deepen their knowledge.

Investment
Training costs € 950 per participant. Price includes lunch and refreshments and excludes tax and duties.

After the training

- You can estimate the effect of raw material nature and preparation on the heat penetration in the batch blanket.
- You can estimate the effect of glass chemistry, colour and redox on radiative heat transfer in the glass melt.
- You can estimate the effects of furnace design on convective heat transfer with help of characteristic dimensionless numbers.

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 then 4 weeks before training free of charge, less then 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.

C19 FLEXIBLE

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.