



Preliminary Announcement & Registration Form

CelSian - NCNG International Glass Technology Course

**Eindhoven, The Netherlands
September 26 – 30, 2016**

In cooperation with:



Introduction & Summary

CelSian Glass & Solar B.V. organizes on regular basis a five-day highly technical, comprehensive Glass Technology training course focused on industrial glass production. This course is developed in cooperation with the NCNG (National Committee Netherlands Glass industry).

The next course is scheduled from **Monday, 26th September till Friday 30th September, 2016** (5 days) at CelSian Glass & Solar in Eindhoven, The Netherlands. The course is open for the employees of international glass producing industries and related suppliers.

This in-depth course covers many aspects of glass and glass production: from raw materials to formed product, including glass structure & properties and glass melting technology. Since 1990, this course has been given to more than 1200 employees from glass industries worldwide. All presentations will be formatted in PowerPoint, and will be in the English language. All participants will receive a comprehensive text book (800 pages), and a PDF copy of the slides used during the course.

This five-day training course is being offered for Eur. 3,200,- per participant. The fee for employees of Glass Trend member companies is Eur. 2,500,-. These costs include an introductory e-learning course by internet, lunches and drinks during the breaks, two dinner invitations, and excluding taxes/duties, hotel accommodation and travel costs.

In addition, all attendants will receive access to our interactive e-learning course, allowing the viewing of 11 short films online (trailer available on www.glasstrend.nl, Tab Events & Agenda). The movies are accompanied by multiple choice questionnaires accessible to the participants in a period of 2 weeks preceding the classical course, for an evaluation on a self-test basis. The required time to take this introductory course is around 2 hours.

Cancellation fee:

- Before August 21st, 2016: free of charge
- Aug. 22th – Sept. 18th, 2016: 50% of the registration fee will be charged
- Sept. 19th – Sept. 25th, 2016: 75% of the registration fee will be charged
- No show: full registration fee will be charged.

The tentative program can be found on page 4 & 5, with more details on the content per subject on pages 7 & 8.

Target group

The course is meant for experienced engineers in the glass industry to receive a more detailed understanding of the glass production, entrants in the glass producing industry and related suppliers and young glass technologists and scientists. Level: high technical and academic.

Registration is now open *(online registration only)*

<http://tinyurl.com/jacnsi6>

(GlassTrend website, www.glasstrend.nl, Tab Events & Agenda)

The number of places available is limited to 25.

The participants receive:

- A five-day classical course dedicated to glass technology for glass industries
- An introductory e-learning course by internet, in the 2 weeks-period preceding the classical course
- A comprehensive textbook on glass properties, glass technology and glass production of about 800 pages
- The Power Point presentations (pdf formatted presentations)
- Lunches & classroom access
- 2x Dinner

Hotel reservations:

On our website <http://www.glasstrend.nl/contact.php> you can find information about our preferred hotel with special rate. You can make your own reservation via a web based booking tool. There are many hotels in Eindhoven. If you need assistance, please contact us.

Location:

CelSian Glass & Solar B.V.

Zwaanstraat 1

5651 CA Eindhoven

The Netherlands

+31 40 2490100

<http://tinyurl.com/jctluas>

Preliminary Program Glass Technology Course

26/09 – 30/09 2016

Place: Eindhoven, The Netherlands

Location: CelSian Glass & Solar building, Zwaanstraat 1

Monday 26 September 2016

| | |
|------------------|--|
| 08.30 – 09.15 hr | Welcome & Introduction |
| 09.15 – 12.30 hr | Module on Glass Structure & Properties, part 1 |
| 12.30 – 13.30 hr | Lunch |
| 13.30 – 17.30 hr | Module Glass Structure & Properties, part 2 |

Tuesday 27 September 2016

| | |
|------------------|--|
| 09.00 – 12.30 hr | Module on Raw Materials & Batch Preparation |
| 12.30 – 13.30 hr | Lunch |
| 13.30 – 17.30 hr | Modules on Recycling and Glass Defects |
| 18.30 – 21.30 hr | Social event, dinner downtown Eindhoven <i>(invited by CelSian Glass & Solar)</i> |

Wednesday 28 September 2016

| | |
|------------------|--|
| 09.00 – 12.30 hr | Module on Melting and Fining Processes, part 1 |
| 12.30 – 13.30 hr | Lunch |
| 13.30 – 17.30 hr | Module on Melting and Fining Processes, part 2 |

Thursday 29 September 2016

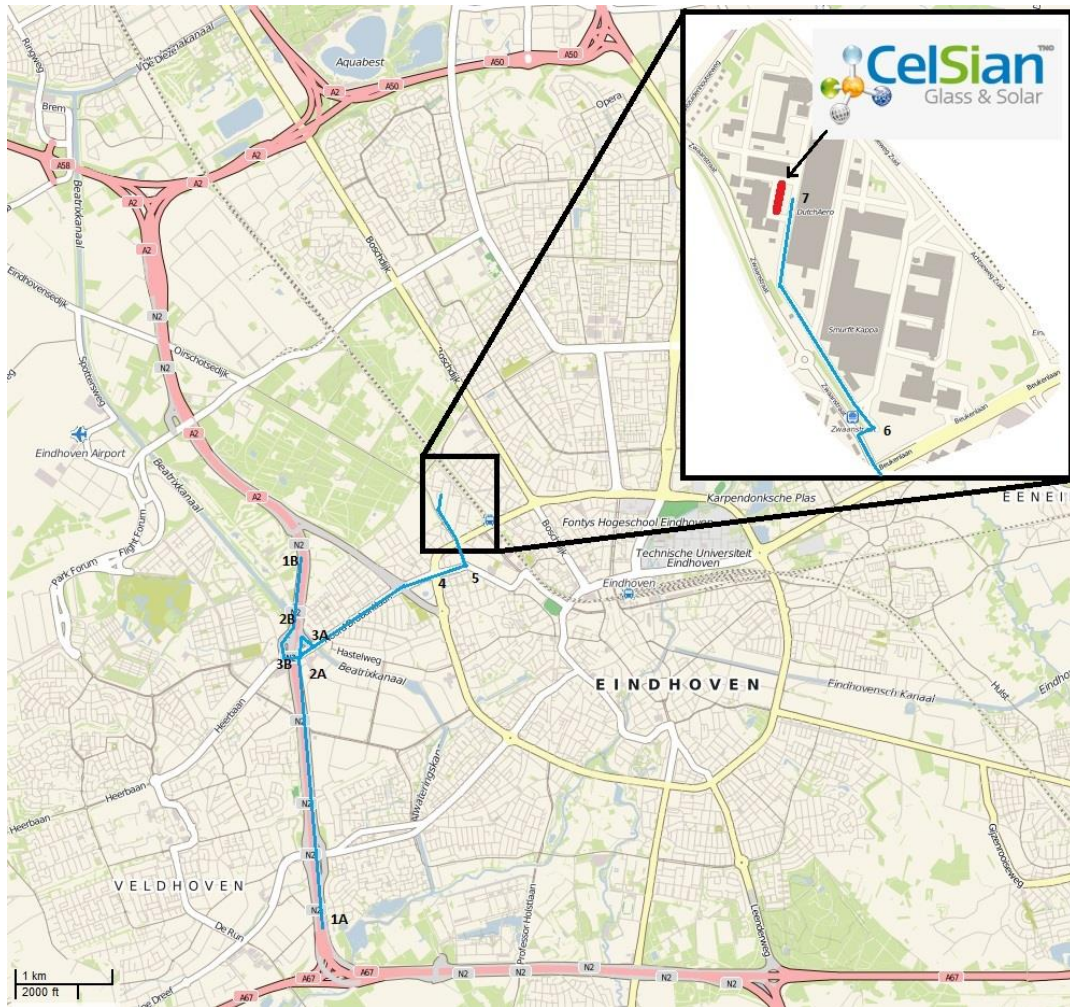
| | |
|------------------|--|
| 09.00 – 12.30 hr | Module on Glass Furnaces, Refractories and Combustion, part 1 |
| 12.30 – 13.30 hr | Lunch |
| 13.30 – 17.30 hr | Module on Glass Furnaces, Refractories and Combustion, part 2 |
| 18.30 – 21.30 hr | Social event, dinner downtown Eindhoven <i>(invited by CelSian Glass & Solar)</i> |

Friday 30 September 2016

| | |
|------------------|--|
| 09.00 – 12.30 hr | Modules on Energy and Environment |
| 12.30 – 13.30 hr | Lunch |
| 13.30 – 16.00 hr | Continuation Modules on Energy and Environment and Multiple choice tests |

16.00 End of the course

CelSian Glass & Solar B.V.
Zwaanstraat 1, Bldg TZ, 5651 CA Eindhoven, the Netherlands



See also: <https://goo.gl/maps/KFybgKNg2Jr>

Content of the course:

The course includes the following subjects:

1. Glass structure and Glass (melt) properties (1 day)
 - a. Glass Chemistry and Physics
 - b. Optical properties
 - c. Mechanical properties
 - d. Physical properties
 - e. Flow properties
 - f. Heat conduction
 - g. Chemical resistance of glass
 - h. Colouring of glass

2. Raw materials for glass (0.5 day)
 - a. Raw material evaluation
 - b. Selection criteria
 - c. Batch preparation and transport
 - d. Batch compositions

3. Melting processes in glass furnaces (3/4 day)
 - a. Melting and fusion of raw materials
 - b. Sand grain dissolution
 - c. Removal of gases (bubbles) – fining, foaming and refining
 - d. Redox chemistry and colour issues
 - e. Homogenisation

4. Glass furnace design, operation and control (1 day)
 - a. Furnace designs
 - b. Refractories and behaviour refractory in glass furnaces
 - c. Combustion systems
 - d. Furnace operation & control

5. Energy efficiency of glass furnaces & emissions (1/2 day)
 - a. Energy balances & Energy saving methods
 - b. Emissions and their sources
 - c. Chemistry of flue gases
 - d. Air pollution Control

6. Recycling of glass (1/2 day)
 - e. Purification of waste glass
 - f. Recycling technologies
 - g. Redox sensors & organic materials in recycled glass

7. Glass defects and glass quality (1/2 day)
 - h. Gas bubbles and their origin
 - i. Knots and their origin
 - j. Stones
 - k. Cords
 - l. Investigation methods for glass faults (defects)