



Glass and Ceramics Manufacturing Course: Float Glass, Container Glass and Ceramic Tile Production



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Introduction:

Glass and ceramics manufacturing, covering float glass, container glass and ceramic tile production, is a 5-day course for process, production and quality engineering teams that ends with a Defect Reduction and Furnace Energy Plan for a case plant. Plants lose pack-to-melt yield and margin when batch chemistry drifts, furnaces run hot to mask seeds and stones, lehrs leave residual strain and tile lines suffer warpage, crazing and kiln losses. Nominees already run or support hot-end, forming, pressing or kiln sections, and learn through inspection walkthroughs of line data. CoreConcept Training Center delivers this glass and ceramics manufacturing course.

Course Objectives:

- Explain how composition, viscosity and body mineralogy govern melting, forming and firing behaviour in glass and tile plants
- Control batch materials, cullet ratio and moisture so that furnace and press feed stay within composition targets
- Evaluate furnace firing options, refining and conditioning settings and refractory wear indicators at management level
- Set tin bath, lehr, IS machine, spray dryer, press and roller kiln parameters that hold product dimensions and strength
- Analyse glass and tile defects to root cause and verify products with ISO 13006 classification and ISO 10545 test methods
- Produce a Defect Reduction and Furnace Energy Plan with emission, heat stress and silica dust controls for a case plant

Target Audience:

- Process engineering teams responsible for furnace, tin bath, lehr and kiln settings in glass and tile plants
 - Production teams that run batch houses, forming machines, presses, glazing lines and kilns on shift
 - Quality control teams responsible for defect inspection, laboratory testing and product release
 - Energy and environmental teams that track fuel, power and stack emissions per tonne of product
 - Technical services teams that lead yield improvement projects and new product trials
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Course Outline:

Day 1: Glass and Ceramic Materials Science and Plant Baseline

- Glass Network Formers, Modifiers and Viscosity Temperature Curve
- Soda-Lime Float and Container Glass Composition Targets
- Clay, Feldspar and Quartz Roles in Porcelain and Stoneware Bodies
- Silica Sand, Soda Ash, Dolomite and Salt Cake Specifications
- Plant Baseline Sheet for Yield, Energy and Defect Rates

Day 2: Batch House and Glass Melting Furnace Technology

- Batch Weighing, Mixing, Moisture and Cullet Ratio Control
- Regenerative End-Port and Cross-Fired Furnace Design Principles
- Oxy-Fuel Firing, Electric Boosting and Hybrid Melting Options
- Melting, Refining, Throat and Forehearth Thermal Conditioning Sequence
- Furnace Campaign Life and Refractory Corrosion Watch Points

Day 3: Float Glass, IS Machine Forming and Ceramic Tile Processing

- Tin Bath Atmosphere, Top Rolls and Ribbon Thickness Control
- Annealing Lehr Profile Between Annealing and Strain Points
- IS Machine Blow-and-Blow and Press-and-Blow Forming Overview
- Slip Milling, Spray Drying and Granulate Moisture Control
- Tile Pressing, Drying, Glazing, Inkjet Decoration and Roller Kiln Firing

Day 4: Defects, Quality Testing, Energy, Emissions and Safety

- Stones, Seeds, Cords and Crizzling Root Cause Mapping
- Tile Warpage, Crazing, Shivering and Pinholing Cause Analysis
- ISO 13006 Classification and ISO 10545 Tile Test Methods
- Furnace Specific Energy, Waste Heat Recovery and Stack Emissions
- Radiant Heat Stress and Respirable Crystalline Silica Dust Controls

Day 5: Inspection Walkthrough and Defect Reduction and Energy Plan

- Case Plant Hot-End Walkthrough Against Process Checklist
 - Case Defect Pareto From Cullet, Lehr and Kiln Records
 - Fishbone and Five Whys Analysis of Top Case Defect
 - Furnace and Kiln Energy Gap Against Plant Baseline
 - Defect Reduction and Furnace Energy Plan Completion and Defence
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Skills You Will Gain:

- Glass Batch Formulation
- Melting Furnace Optimisation
- Float Ribbon Control
- Container Forming Oversight
- Tile Body and Glaze Matching
- Glass Defect Diagnosis
- Ceramic Tile Testing
- Hot-End Energy Benchmarking

Why Attend This Course:

- Deliver a Defect Reduction and Furnace Energy Plan for a case plant to the plant manager and the technical director
- Decide whether a seed, stone or crazing problem calls for a batch, furnace, forming or firing correction using line evidence
- Avoid pack-to-melt losses, customer claims and excess fuel per tonne caused by unstable melting and firing
- Share defect guides, batch control sheets, Lehr and kiln profiles and energy baselines with shift and quality colleagues

Conclusion:

Back at work, the participant gives the plant manager, the technical director and the quality lead a Defect Reduction and Furnace Energy Plan that ranks the main glass and tile defects, links each to a batch, furnace, forming or firing cause and sets energy and emission targets. Management uses it to approve trials, furnace and kiln setting changes and repair budgets, while shift teams use its defect guides and checklists at the line. After the first month under the plan, the unit should review pack-to-melt yield, defect rates, fuel per tonne and silica dust readings against the baseline.

Frequently Asked Questions FAQ:

What should participants know before the glass and ceramics manufacturing course?

Participants should already work in process, production or quality roles in a float glass, container glass or ceramic tile plant and read furnace or kiln trends. Bringing anonymised defect, yield and energy records helps them apply the walkthrough and the plan to their own line.

How does a glass and ceramics manufacturing course differ from a refractory maintenance or cement plant course?

It follows the glass and tile process from batch to finished product and reduces defects and energy along that chain. Refractory courses cover lining installation and repair, and cement plant courses cover clinker burning and cement grinding; both appear here only as brief context.

Why do seeds and stones appear in glass and ceramics manufacturing?

Seeds are small gas bubbles left when refining is incomplete, often after batch, temperature or redox drift. Stones are unmelted batch, devitrified glass or refractory fragments. Tracing each by size, composition and position points to the batch, furnace or refractory cause.

What do participants take back from the glass and ceramics manufacturing course?

Participants take back a Defect Reduction and Furnace Energy Plan for a case plant, with a defect Pareto, root cause sheets, a lehr and kiln profile review, an energy and emission baseline and heat and silica dust control checklists they can adapt to their own line.
