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Forehearth and Glass Condtioning Training

Course Information

Course Title:	**Forehaerth and Glass Conditioning Training**
Duration & Location:	**3** Days, **13 – 15 Oct 2026** at BEG Training Center in **Windsor (CT), US.**
Target Audience:	Operators, Production Specialist,
Course prerequisites:	Entry level course to the glass industry. No forming knowledge is required.
Instructor:	Operational Trainer: Ian Kirton

Course Objectives

- Safety / SOP
- The role of the forehearth in controlling glass temperature, viscosity, and forming quality.
- Identify key forehearth structural components, materials, and zone functions.
- Implement corrective actions to maintain consistent glass flow and forming conditions.
- Diagnose common forehearth-related defects

Assessment Methods

- Quizzes, Assignments, Practical Participation
- Final Group Task

Resources Required

- Personal Protective Equipment
- eLearning platform access (pre-learning)
- Simulation Software (if applicable)

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Course Schedule (Daily Outline from 8:00 am to 4:30 pm)

Training Days	Topics	Activities	Expected Outcomes
Day 1	• Introduction to the Forehearth • Forehearth Structure & Refractory Materials • Basic Glass Flow & Zone Concepts	• Instructor-led overview of forehearth purpose and role in glass quality • Visual walkthrough of forehearth zones (superstructure, heating, cooling, measuring points) • Group discussion on refractory materials (silica, alumina, AZS) and their functions • Case examples of structural issues and their impact on glass flow	• Understand the purpose of the forehearth in glass production • Identify key structural components and materials • Explain how zone design affects glass temperature, flow, and homogeneity • Recognize how structural integrity supports consistent forming conditions
Day 2	• Heating the Forehearth • Cooling in the Forehearth • Glass Forehearth Temperature Measurement	• Review of heat transfer theory (radiation-dominant systems) • Comparison of heating methods (fuel/air, electric assist, early heating strategies) • Demonstration of cooling concepts (direct air, indirect air, combined cooling) • Thermocouple placement exercise and temperature profiling scenarios • Discussion on temperature control challenges and drift	• Explain how heating and cooling systems work together to maintain thermal balance • Understand correct use and placement of thermocouples • Interpret temperature profiles across zones • Recognize the relationship between temperature stability and glass viscosity
Day 3	• Forehearth Electric Boost • Glass Conditioning Principles • Forehearth Operational Control	• Overview of molybdenum electrode systems and protection requirements • Review of electrical safety, grounding, and insulation principles • Analysis of conditioning objectives (thermal homogeneity, consistency) • Operational scenarios covering setpoint control, PID response, and adjustments • Group troubleshooting of flow and temperature imbalance cases	• Understand when and why electric boost is applied • Identify safety and operational limits of electric boosting • Apply glass conditioning concepts to improve quality and consistency • Operate forehearth systems with focus on outcomes, not just temperature targets
Day 4	• Forehearth Blisters, Seeds & Electric Defects • Operational Deviations & Corrective Actions • Integrated Forehearth Optimization	• Review of blister, seed, and bubble formation mechanisms • Root cause analysis using temperature, chemistry, and operational data	• Identify common forehearth-related glass defects and their causes • Apply systematic troubleshooting techniques

		• Inspection and diagnostic methods (visual, process checks, system review) • Team exercise: corrective action planning for common forehearth defects • Final wrap-up discussion linking structure, control, operations, and quality	• Recommend corrective actions involving temperature, pressure, or composition • Demonstrate a holistic understanding of forehearth performance and quality control

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