



Accredited Africa Training Institute for Capacity Development

Unit FO409, Hatfield Plaza · 1122 Burnett St, Hatfield 0028 · Pretoria, Gauteng · South Africa

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COURSE BROCHURE

Glass Melting Technology And Conditioning Process Techniques Training

Manufacturing, Engineering and Technology / Manufacturing and Assembly

Unit Standard 110287 · NQF Level 3 · 12 Credits · 9 Days

COURSE OVERVIEW

This course provides comprehensive training on the principles and practices of glass melting technology and conditioning process techniques. Participants will gain a deep understanding of the entire glass melting process, from raw material selection to conditioning and delivery, enabling them to optimize production efficiency and product quality.

Category	Manufacturing, Engineering and Technology
Subfield	Manufacturing and Assembly
Unit Standard	110287
Accreditation	SAQA Accredited · NQF Level 3 · 12 Credits
Duration	9 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Analyze the principles of glass melting and the role of various raw materials in the melting process.
- Evaluate different furnace designs and their impact on melting efficiency and glass quality.
- Implement conditioning process techniques to control glass temperature, homogeneity, and viscosity.
- Apply troubleshooting methods to identify and resolve common melting and conditioning issues.
- Demonstrate compliance with safety and environmental regulations in glass melting operations.
- Design process adjustments to optimize energy consumption and reduce emissions.

WHO SHOULD ATTEND

- This course is designed for glass manufacturing technicians, process engineers, production supervisors, and quality control personnel working in the glass industry.
- It is also suitable for individuals seeking to specialize in glass melting and conditioning technologies.

COURSE OUTLINE

Day 1: Introduction to Glass Melting Technology

- Overview of glass types and their applications.
- Raw materials: silica, soda ash, limestone, and additives.
- Batch preparation and mixing.
- Melting process: solid-state reactions, fusion, refining.
- Furnace types: regenerative, recuperative, electric.
- Heat transfer mechanisms in glass melting.
- Role of refractory materials.
- Safety in glass melting operations.

Day 2: Furnace Design and Operation

- Furnace components: melter, refiner, working end.
- Regenerative vs. recuperative furnaces.
- Electric boosting and all-electric furnaces.
- Combustion: fuel types, burners, air/fuel ratio.
- Energy efficiency and heat recovery.
- Furnace pressure and atmosphere control.
- Refractory selection and maintenance.
- Operational procedures for furnace longevity.

Day 3: Melting Process Control and Optimization

- Temperature measurement: thermocouples, optical pyrometers.
- Melt level control and glass flow.
- Redox control and fining agents.
- Batch-to-melt conversion efficiency.
- Process modeling and simulation.
- Troubleshooting common melting issues.
- Statistical process control in melting.
- Case studies on optimization.

Day 4: Glass Conditioning Principles

- Conditioning process: cooling, homogenizing, stabilizing.
- Refiner design and function.
- Thermal homogeneity and its measurement.
- Glass flow patterns in conditioning channels.
- Stirring and bubbling for homogenization.
- Residence time distribution.
- Conditioning for specific forming processes.
- Quality issues from poor conditioning.

Day 5: Advanced Conditioning Techniques

- Electric heating in conditioning zones.
- Forehearth design and operation.
- Precision temperature profiling.
- Use of thermocouples and control loops.
- Conditioning for container glass, flat glass, fiberglass.

- Color control and batch adjustment.
- Minimizing defects: seeds, stones, cords.
- Process automation in conditioning.

Day 6: Quality Assurance in Melting and Conditioning

- Types of defects: bubbles, inclusions, streaks.
- Root cause analysis of defects.
- Sampling and testing methods: visual, chemical, physical.
- In-line inspection systems.
- Statistical quality control.
- Process capability and improvement.
- Standards and specifications.
- Documentation and traceability.

Day 7: Energy Management and Environmental Compliance

- Energy audit and benchmarking.
- Waste heat recovery technologies.
- Oxygen-enriched combustion.
- Reduction of greenhouse gas emissions.
- Particulate and NOx control.
- Water and raw material conservation.
- Recycling cullet and its benefits.
- Regulatory framework in South Africa.

Day 8: Troubleshooting and Problem Solving

- Troubleshooting furnace refractory failures.
- Addressing combustion imbalances.
- Dealing with batch segregation.
- Resolving temperature profile deviations.
- Managing foam and scum.
- Handling glass level fluctuations.
- Case studies of real-world problems.
- Preventive maintenance strategies.

Day 9: Integration and Future Trends

- Industry 4.0: digitalization and IoT in glass plants.
- Advanced sensors and process control.
- New furnace designs: zero-emission concepts.
- Alternative energy sources.
- Integration of melting, conditioning, and forming.
- Best practices and case studies.
- Course review and assessment.
- Action plan for implementation.

ASSESSMENT & CERTIFICATION

Delegates are assessed through exercises and a final test. A mark of **50% or above** earns an **AATICD Certificate of Completion**, issued digitally with a unique verification code. This course carries **12 NQF credits** at **NQF Level 3**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 33,300.00	R 33,300.00
1	In-House	R 43,300.00	R 43,300.00
1	On-Campus (Pretoria)	R 50,000.00	R 50,000.00

UPCOMING SESSIONS

Start	End	Method	Venue
03 Aug 2026	13 Aug 2026	On-Campus	Dubai, UAE
04 Aug 2026	14 Aug 2026	On-Campus	Pretoria, South Africa
04 Aug 2026	14 Aug 2026	On-Campus	Lagos, Nigeria
05 Aug 2026	17 Aug 2026	On-Campus	Johannesburg, South Africa
06 Aug 2026	18 Aug 2026	On-Campus	Mauritius
07 Aug 2026	19 Aug 2026	On-Campus	Cape Town, South Africa
10 Aug 2026	20 Aug 2026	On-Campus	Pretoria, South Africa
11 Aug 2026	21 Aug 2026	On-Campus	Abu Dhabi, UAE

Contact us if no suitable date is listed – on-demand sessions can be arranged for groups.

HOW TO GET A QUOTE OR APPLY

1. **Get an instant quotation online:** visit www.aaticd.co.za, open the page for this course (Unit Standard 110287) and click **Get A Quote / Apply**. Select your training method and number of delegates – your quotation is generated immediately and emailed to you with the course brochure attached.
2. **Apply by email:** send the course title, your preferred training method (Online, In-House or On-Campus Pretoria), the number of delegates and your preferred dates to apply@aaticd.co.za – our team will reply with a formal quotation.
3. **Apply by phone or WhatsApp:** call **+27 12 004 8389** or WhatsApp **+27 65 077 6310** and we will prepare your quotation and reserve your seats.
4. **Confirm your booking:** accept the quotation and settle the invoice. As soon as payment is confirmed your delegates are enrolled and receive their AATICD LMS login details by email, along with joining instructions for their chosen training method.

Group discounts apply automatically – the more delegates you enrol, the lower the price per delegate. No payment is required to request a quotation.

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