



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

Pan Boiling Operations Control For Sugar Processing Training

Agriculture and Nature Conservation / Secondary Agriculture

Unit Standard 114287 · NQF Level 4 · 14 Credits · 11 Days

COURSE OVERVIEW

This course equips learners with the knowledge and skills required to control pan boiling operations in sugar processing. It focuses on monitoring and adjusting boiling parameters to ensure optimal sugar crystal formation, yield, and quality while adhering to safety and hygiene standards.

Category	Agriculture and Nature Conservation
Subfield	Secondary Agriculture
Unit Standard	114287
Accreditation	SAQA Accredited · NQF Level 4 · 14 Credits
Duration	11 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Monitor and control pan boiling parameters such as temperature, pressure, and syrup density to achieve desired crystal growth.
- Apply safety procedures and hygiene standards during pan boiling operations to prevent contamination and accidents.
- Analyze boiling curves and adjust steam supply, vacuum, and feed rates to maintain optimal conditions.
- Evaluate crystal quality and troubleshoot common issues like false grain or conglomerates.
- Implement corrective actions based on laboratory reports and visual inspections to maintain product consistency.
- Demonstrate effective communication and documentation of operational data for shift handover and quality records.

WHO SHOULD ATTEND

- This course is intended for process operators, shift supervisors, and technicians in sugar mills or refineries who are responsible for pan boiling operations.
- It is also suitable for individuals seeking to formalize their expertise in sugar processing.

COURSE OUTLINE

Day 1: Introduction to Sugar Processing and Pan Boiling

- Overview of sugar processing from cane to crystal
- Introduction to pan boiling: purpose and principles
- Key equipment: vacuum pans, condensers, and receivers
- Safety protocols in the boiling house
- Quality parameters: purity, colour, and crystal size
- Roles and responsibilities of a pan boiler operator

Day 2: Principles of Crystallisation and Supersaturation

- Solubility and saturation of sucrose
- Supersaturation ratio and its control
- Nucleation: spontaneous and seeding methods
- Crystal growth kinetics
- Impurities and their effects on crystallisation
- Overview of pan boiling cycles

Day 3: Vacuum Pan Equipment and Instrumentation

- Anatomy of a vacuum pan: calandria, downtake, sight glasses
- Vacuum system: ejectors, condensers, and barometric legs
- Steam supply and condensate removal
- Instrumentation: temperature, pressure, vacuum gauges, refractometers
- Control valves and actuators
- Maintenance basics for vacuum pans

Day 4: Pan Boiling Operations – Massecuite Preparation

- Syrup concentration and brix measurement
- Seed preparation: slurry or magma
- Footing: initial charge and graining
- Boiling curves and steam management
- Adding syrup and controlling feed rate
- Monitoring crystal content and consistency

Day 5: Boiling Techniques – A, B, and C Massecuites

- Single, double, and three-boiling systems
- A-massecuite: high-grade boiling
- B-massecuite: intermediate boiling
- C-massecuite: low-grade boiling and recovery
- Purging and washing techniques
- Troubleshooting common boiling issues

Day 6: Process Control and Automation in Pan Boiling

- Feedback and feedforward control
- PID controllers for steam, vacuum, and feed
- Distributed control systems (DCS) overview
- Alarm management and response
- Data logging and trend analysis

- Manual vs. automatic operation

Day 7: Quality Control and Laboratory Analysis

- Sampling methods for massecuite and molasses
- Brix, pol, purity, and colour analysis
- Crystal size distribution measurement
- Moisture content and ash determination
- Laboratory equipment: refractometer, polarimeter, sieve shaker
- Documentation and reporting

Day 8: Energy Efficiency and Sustainability

- Steam economy in vacuum pans
- Heat recovery and condensate management
- Optimising boiling cycles for energy efficiency
- Reducing molasses exhaustion
- Environmental compliance and waste minimisation
- Case studies on energy savings

Day 9: Troubleshooting and Problem Solving

- Common issues: false grain, conglomerates, low yield, poor exhaustion
- Systematic troubleshooting approach
- Root cause analysis tools
- Adjusting parameters to rectify problems
- Communication with shift teams
- Emergency procedures

Day 10: Advanced Topics – Pan Boiling for Speciality Sugars

- Production of brown sugars, golden syrup, and liquid sugars
- Controlling colour development during boiling
- Flavour compounds and their management
- Continuous pan boiling systems
- New sensor technologies and real-time control
- Industry 4.0 in sugar processing

Day 11: Integration, Assessment, and Certification

- Review of all learning outcomes
- Integrated case studies
- Written knowledge test
- Practical assessment on simulated or actual pan
- Feedback and improvement plan
- Certification and career pathways

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 **14 NQF credits** at **NQF Level 4**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 38,400.00	R 38,400.00
1	In-House	R 49,900.00	R 49,900.00
1	On-Campus (Pretoria)	R 57,600.00	R 57,600.00

UPCOMING SESSIONS

Start	End	Method	Venue
10 Aug 2026	24 Aug 2026	On-Campus	Abu Dhabi, UAE
11 Aug 2026	25 Aug 2026	On-Campus	Durban, South Africa
11 Aug 2026	25 Aug 2026	On-Campus	Mauritius
12 Aug 2026	26 Aug 2026	On-Campus	Cape Town, South Africa
13 Aug 2026	27 Aug 2026	On-Campus	Dubai, UAE
14 Aug 2026	28 Aug 2026	On-Campus	Pretoria, South Africa
17 Aug 2026	31 Aug 2026	On-Campus	Durban, South Africa
18 Aug 2026	01 Sep 2026	On-Campus	Shenzhen, China

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 114287) 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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