



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

Sugar Pan Boiling Optimisation Techniques Training

Agriculture and Nature Conservation / Secondary Agriculture

Unit Standard 114293 · NQF Level 5 · 16 Credits · 13 Days

COURSE OVERVIEW

This course equips sugar processing professionals with advanced techniques for optimising sugar pan boiling operations to maximise yield, improve sugar quality, and reduce energy consumption. Participants will gain practical skills in monitoring and controlling boiling processes, troubleshooting common issues, and implementing best practices for efficient pan operation.

Category	Agriculture and Nature Conservation
Subfield	Secondary Agriculture
Unit Standard	114293
Accreditation	SAQA Accredited · NQF Level 5 · 16 Credits
Duration	13 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Apply principles of sugar crystallisation to optimise pan boiling processes.
- Analyse boiling parameters (temperature, vacuum, supersaturation) to achieve target massecuite consistency.
- Evaluate the impact of different seeding and graining techniques on crystal size and yield.
- Implement corrective actions to address common pan boiling problems such as false grain, conglomerates, and colour formation.
- Demonstrate effective monitoring and control of pan boiling cycles using instrumentation and process data.

WHO SHOULD ATTEND

- This course is designed for sugar processing technicians, shift supervisors, and production managers involved in sugar pan boiling operations at sugar mills or refineries.

COURSE OUTLINE

Day 1: Introduction to Sugar Pan Boiling and Fundamentals

- Overview of the sugar manufacturing process
- Types of pans and their components
- Basic thermodynamics and heat transfer
- Introduction to syrup, massecuite, and molasses
- Safety considerations in the boiling house

Day 2: Crystallization Theory and Supersaturation

- Solubility of sucrose in water
- Supersaturation ratio and metastable zone
- Primary and secondary nucleation
- Crystal growth kinetics
- Factors affecting crystallization rate

Day 3: Massecuite Preparation and Pan Feeding

- Types of massecuite: A, B, C, and affination
- Seed preparation and footing formation
- Continuous vs. batch feeding
- Material balance calculations
- Impact of syrup purity and brix

Day 4: Pan Boiling Process Control

- Vacuum control and its effect on boiling point
- Brix measurement and control
- Temperature profiling during boiling
- Steam pressure and flow regulation
- Troubleshooting foaming and false grain

Day 5: Striking, Discharge, and Crystallizer Operations

- Criteria for striking: pan floor tests, conductivity, consistency
- Procedures for discharging massecuite
- Crystallizer design and cooling curves
- Retention time and final exhaustion
- Maintenance of crystallizer drives and cooling systems

Day 6: Centrifugal Separation and Sugar Washing

- Batch and continuous centrifuges
- Centrifugal force and basket selection
- Wash water application and timing
- Molasses removal and sugar drying
- Common centrifuge problems and solutions

Day 7: Energy Efficiency and Steam Optimization

- Vapor bleeding and heat recovery
- Optimal pan scheduling for steam demand
- Insulation and condensate management
- Energy benchmarking

- Impact of boiling parameters on steam consumption

Day 8: Quality Control and Sugar Specifications

- Sugar color, ash, moisture, and grain size distribution
- Polarization and safety factor
- Masseccuite exhaustion and purity drop
- Laboratory analysis: brix, pol, conductivity
- Statistical process control (SPC) basics

Day 9: Advanced Pan Boiling Techniques

- Continuous vacuum pan design and operation
- Seed slurry preparation and dosing
- Grain size control and uniformity
- Automatic pan boiling systems
- Use of software models for optimization

Day 10: Troubleshooting and Problem Solving

- False grain formation and prevention
- Slow boiling and poor circulation
- High molasses purity and low yield
- Equipment failures: pumps, valves, vacuum systems
- Case studies of typical issues

Day 11: Process Optimization and Yield Improvement

- Yield calculation and benchmarking
- Optimization of pan cycle time
- Managing impurities: reducing sugars, ash, color
- Heat transfer enhancement
- Simulation and modeling for optimization

Day 12: Safety, Environmental, and Regulatory Compliance

- Hazard identification and risk assessment
- Personal protective equipment (PPE)
- Effluent management and waste reduction
- Occupational health and safety act requirements
- ISO standards and audit readiness

Day 13: Integration, Assessment, and Continuous Improvement

- Review of key concepts and best practices
- Group exercise: optimize a boiling schedule
- Developing a continuous improvement plan
- Final knowledge assessment
- Course evaluation and certification

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 **16 NQF credits** at **NQF Level 5**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 45,700.00	R 45,700.00
1	In-House	R 59,400.00	R 59,400.00
1	On-Campus (Pretoria)	R 68,500.00	R 68,500.00

UPCOMING SESSIONS

Start	End	Method	Venue
10 Aug 2026	26 Aug 2026	On-Campus	Dubai, UAE
11 Aug 2026	27 Aug 2026	On-Campus	Pretoria, South Africa
12 Aug 2026	28 Aug 2026	On-Campus	Abu Dhabi, UAE
13 Aug 2026	31 Aug 2026	On-Campus	Durban, South Africa
13 Aug 2026	31 Aug 2026	On-Campus	Mauritius
14 Aug 2026	01 Sep 2026	On-Campus	Cape Town, South Africa
17 Aug 2026	02 Sep 2026	On-Campus	Pretoria, South Africa
18 Aug 2026	03 Sep 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 114293) 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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