



Sugar Refining Course: Raw Sugar Melting, Clarification, Crystallisation and Centrifugals



Sugar Refining Course: Raw Sugar Melting, Clarification, Crystallisation and Centrifugals

Introduction:

Sugar refining, covering raw sugar melting, clarification, crystallisation and centrifugals, is the subject of this 5-day course for process, quality control and maintenance teams in raw-sugar refineries, who produce a Refinery Performance and Sucrose Loss Reduction Plan for a case refinery. Refineries lose sucrose to molasses, burn excess steam and miss colour specifications when affination, liquor purification and pan boiling run on habit, not on purity, Brix and colour data. Nominees already operate, test or maintain refinery plant, practising through inspection walkthroughs of melt house, boiling house and sugar end records. CoreConcept Training Center delivers this sugar refining course.

Course Objectives:

- Trace sucrose, non-sugars and colour through each refinery station using purity, Brix and pol data from raw sugar receipt to bagged white sugar
- Run affination, melting, carbonatation or phosphatation and decolourisation stations to target melt liquor clarity and colour removal
- Control multiple-effect evaporators and vacuum pan strikes, from seeding in the metastable zone to massecuite drop, to hit crystal size and yield
- Operate batch and continuous centrifugals, granulators and conditioning silos to meet moisture, crystal size and ICUMSA colour limits
- Diagnose sucrose losses, steam overuse and sugar dust explosion hazards across the refinery and set controls for each
- Build a refinery performance and sucrose loss reduction plan with station targets, checks and owners for a case refinery

Target Audience:

- Process and shift operations staff responsible for melt house, clarification, decolourisation and boiling house stations
 - Pan boiling and centrifugal station staff responsible for strikes, massecuite curing and sugar separation
 - Quality control laboratory staff responsible for Brix, pol, purity, colour, ash and moisture testing
 - Maintenance technicians responsible for evaporators, vacuum pans, centrifugal baskets, filters and dryers
 - Refinery utilities and safety staff responsible for steam, vacuum, condensate and combustible dust controls
-

Course Outline:

Day 1: Raw Sugar Quality, Refinery Flow and Sucrose Accounting

- Raw Sugar Receipt Sampling for Pol, Moisture and Colour
- Refinery Process Flow From Affination to White Sugar Silo
- Brix, Pol and Purity Definitions Applied to Refinery Streams
- ICUMSA Methods Book Colour Measurement at 420 nm
- Refinery Sucrose Balance Baseline From Station Records

Day 2: Affination, Melting, Clarification and Decolourisation

- Affination Magma Mingling and Molasses Film Wash Settings
- Melter Sweetwater Use and Melt Liquor Brix Control
- Carbonatation Milk of Lime Dosing and Carbon Dioxide Gassing
- Phosphatation Clarifier Floc Formation and Scum Removal
- Activated Carbon and Ion-Exchange Resin Decolourisation Cycles

Day 3: Evaporators, Vacuum Pans and Massecuite Boiling

- Multiple-Effect Evaporator Vapour Bleeding and Scale Control
- Standard Liquor Preparation and Vacuum Pan Charging Sequence
- Supersaturation Metastable Zone Seeding With Slurry
- Massecuite Strike Tightening, Brix Rise and Drop Point
- Jet Syrup Recycling Scheme Across Successive White Strikes

Day 4: Centrifugals, Sugar End, Recovery House and Dust Hazards

- Batch Centrifugal Cycle Timing, Wash Water and Screen Wear
- Continuous Centrifugal Use on Low-Grade Recovery Massecuities
- Rotary Granulator Drying, Cooling and Silo Conditioning
- Final Molasses Exhaustion and Undetermined Sucrose Loss Diagnosis
- Sugar Dust Explosion Pentagon, Housekeeping and Venting Controls

Day 5: Inspection Walkthrough and the Refinery Performance Plan

- Case Refinery Walkthrough Against a Station Inspection Checklist
 - Case Sucrose Balance Reconciliation and Loss Ranking
 - Steam per Tonne Melt Review Against Evaporator and Pan Data
 - Colour Removal and Crystal Size Targets for Each Station
 - Refinery Performance and Sucrose Loss Reduction Plan Completion
-

Skills You Will Gain:

- Refinery Sucrose Balancing
- Melt Liquor Clarification Control
- Decolourisation Cycle Management
- Vacuum Pan Strike Boiling
- Centrifugal Performance Tuning
- Sugar Colour and Moisture Testing
- Combustible Dust Hazard Control
- Steam Economy Analysis

Why Attend This Course:

- Deliver a Refinery Performance and Sucrose Loss Reduction Plan for a case refinery to the refinery manager and the process and quality leads
- Judge when to change lime dose, carbon or resin regeneration, pan seeding or centrifugal wash settings using purity, colour and Brix evidence
- Prevent off-colour white sugar, sucrose lost to final molasses, wasted steam and dust ignition events that stop the refinery
- Coach shift operators and laboratory technicians on the station checklists, balance sheets and dust housekeeping rounds behind the plan

Conclusion:

Once back at work, the participant hands the Refinery Performance and Sucrose Loss Reduction Plan to the refinery manager, the boiling house lead and the quality control laboratory. They use it to agree station targets for melt liquor colour, massecuite purity, centrifugal wash and steam per tonne of melt, and to decide which losses and dust hazards are tackled first. After the first full campaign month, the team should compare recovery, white sugar colour, moisture and steam use with the plan baseline and reset targets.

Frequently Asked Questions FAQ:

What should participants know before a sugar refining course?

Participants should already work in a raw-sugar refinery in process, laboratory or maintenance roles and understand Brix and basic arithmetic. No engineering degree is needed. Bringing station logs, laboratory sheets or a recent sucrose balance helps them apply the walkthroughs to their own refinery.

How does a sugar refining course differ from a general food processing or edible oil refining course?

It follows one product, sucrose, through affination, liquor purification, decolourisation, pan boiling and centrifugals. General food processing courses span many product lines, and edible oil refining courses cover degumming, bleaching and deodorisation of fats, so neither teaches massecuite boiling or molasses exhaustion.

Why does sugar refining measure white sugar colour in ICUMSA units?

ICUMSA colour gives refineries and buyers one agreed laboratory method, measuring light attenuation of a sugar solution at 420 nm. A single number lets the refinery set colour removal targets for each station and grade white sugar consistently against customer specifications.

What does a participant take back from the sugar refining course?

Each participant takes back a Refinery Performance and Sucrose Loss Reduction Plan for a case refinery, with a station inspection checklist, a sucrose balance worksheet, colour and crystal size targets and a dust housekeeping round they can adapt to their own plant.