



PTA and PET Polyester Plant Operations

Course: Paraxylene Oxidation, Polycondensation and SSP



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Introduction:

PTA and PET polyester plant operations, from paraxylene oxidation through polycondensation and SSP, is a 5-day course for oxidation, purification, polymer and quality staff that ends with a PTA-to-PET Line Operating and Grade Quality Plan for a case site. Polyester sites lose yield and prime chip when 4-CBA climbs in crude acid, acetic acid burns in the oxidiser, finisher vacuum slips and intrinsic viscosity or acetaldehyde drifts outside bottle or fibre limits. Nominees already run or support PTA or PET sections and learn through case studies on panel trends and laboratory data. CoreConcept Training Center delivers this PTA and PET polyester plant operations course.

Course Objectives:

- Control paraxylene oxidation through catalyst ratio, air rate and off-gas oxygen to limit acetic acid burn and 4-CBA in crude acid
- Run hydrogenation, crystallisation and filtration of crude terephthalic acid to deliver purified PTA within specification
- Operate esterification and melt polycondensation sections by setting paste ratio, temperatures and finisher vacuum to reach target intrinsic viscosity
- Dose polycondensation catalyst, stabiliser, toner and comonomers to match fibre, film or bottle resin specifications
- Manage solid-state polymerisation crystallisation, nitrogen purification and residence time to raise IV and lower acetaldehyde in bottle chip
- Prepare a PTA-to-PET Line Operating and Grade Quality Plan from case site data

Target Audience:

- Control room staff responsible for oxidation reactors, crystallisers and solvent recovery in PTA units
 - Panel and field staff responsible for esterifiers, prepolymerisers, finishers and chip cutters in PET units
 - Shift supervisory staff responsible for rate changes, grade switches and upset response across PTA and PET sections
 - Process engineering staff responsible for catalyst dosing, vacuum systems and SSP reactor settings
 - Quality control and laboratory staff responsible for 4-CBA, IV, acetaldehyde and colour results that release product
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Course Outline:

Day 1: Paraxylene to Polyester Value Chain and Site Performance Picture

- Paraxylene, PTA, MEG and PET Mass Flows on Site
- Direct Esterification Versus DMT Transesterification Route Comparison
- Fibre, Film and Bottle Resin Families by Intrinsic Viscosity Band
- Acetic Acid Burn and Paraxylene Yield per Tonne of PTA
- Current Site Review of Off-Grade Chip and Unit Stoppages

Day 2: PTA Oxidation Chemistry, Crude Acid Purification and Solvent Recovery

- Cobalt, Manganese and Bromide Catalyst Ratio in Oxidation
- Bubble Column Oxidiser Air Rate, Off-Gas Oxygen and Pressure
- 4-CBA and Para-Toluic Acid Formation From Incomplete Oxidation
- Palladium on Carbon Hydrogenation of Crude Terephthalic Acid
- Crystalliser Train, Rotary Filter and Acetic Acid Dehydration Column

Day 3: PET Esterification, Melt Polycondensation and Additive Dosing

- PTA and MEG Paste Mole Ratio and Slurry Preparation
- Esterifier Temperature, Pressure and Reaction Water Column Control
- Prepolymeriser and Finisher Vacuum, Melt Level and Agitator Speed
- Antimony and Titanium Catalyst, Phosphorus Stabiliser and Cobalt Toner
- Isophthalic Acid and DEG Comonomer Control for Bottle Copolymers

Day 4: Solid-State Polymerisation, IV Drift and Grade Quality Faults

- SSP Crystalliser Residence Time and Chip Sticking Prevention
- Nitrogen Loop Purification and SSP Reactor IV Build Rate
- Acetaldehyde Stripping and Regeneration in Bottle Chip Production
- Online Melt Viscometer Versus Laboratory IV Result Reconciliation
- Chip Colour, Carboxyl End Groups and Fibre Spinning Breaks Diagnosis

Day 5: Case Study Practice and the PTA-to-PET Line Operating Plan

- Case Oxidiser Trend Review of Rising 4-CBA
 - Case Finisher Vacuum Loss and Low IV Lot
 - Case Bottle Chip Rejection for High Acetaldehyde
 - Grade Release Matrix for Fibre and Bottle Customers
 - PTA-to-PET Line Operating and Grade Quality Plan Completion
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Skills You Will Gain:

- Oxidation Catalyst Ratio Control
- Crude Acid Hydrogenation Operation
- Esterifier Water Balance Control
- Finisher Vacuum Management
- Polyester Additive Dosing
- SSP Reactor Operation
- Intrinsic Viscosity Reconciliation
- Chip Grade Release Testing

Why Attend This Course:

- Deliver a PTA-to-PET Line Operating and Grade Quality Plan to the production manager and the technical service head for the case site
- Decide whether falling IV or rising acetaldehyde calls for a finisher vacuum, catalyst or SSP residence change
- Avoid rejected bottle chip lots, spinning breaks at fibre customers and excess acetic acid loss caused by late reading of trends
- Coach panel operators and laboratory technicians on 4-CBA, IV and acetaldehyde checks using the course case material

Conclusion:

Back at the site, the participant hands the PTA-to-PET Line Operating and Grade Quality Plan to the production manager and the technical service head. Oxidation and polymer section leads use it to agree catalyst ratios, finisher vacuum targets and SSP residence settings for each resin grade, while the laboratory uses its grade release matrix to approve fibre and bottle chip. After the first grade campaign under the plan, the site should review acetic acid burn, 4-CBA, IV spread and acetaldehyde results and reset targets that missed.

Frequently Asked Questions FAQ:

What should participants know before the PTA and PET polyester plant operations course?

Participants should already work in a PTA oxidation, purification, PET polymer or quality section and read panel trends and laboratory sheets. No polymer chemistry degree is needed. Bringing anonymised oxidiser trends, IV records or acetaldehyde results helps them apply the case studies to their own site.

How does PTA and PET polyester plant operations training differ from a plastics moulding course?

It stays inside the resin-producing site: paraxylene oxidation, acid purification, esterification, polycondensation and SSP. Moulding courses start with finished chip and cover drying, preform injection and bottle blowing, which appear here only where chip IV and acetaldehyde affect the converter.

Why do bottle grades need SSP in PTA and PET polyester plant operations?

Melt polycondensation alone cannot raise intrinsic viscosity high enough for bottles without colour and acetaldehyde build-up. Solid-state polymerisation continues chain growth in crystallised chip under nitrogen below the melting point, raising IV while stripping acetaldehyde for taste-sensitive drinks.

What do participants take back from the PTA and PET polyester plant operations course?

Participants take back a PTA-to-PET Line Operating and Grade Quality Plan with oxidation and finisher operating targets, SSP settings, a grade release matrix for fibre and bottle chip and case study notes ready to adapt to their own site.