



Plastics Injection and Blow Moulding Course: PET Preforms, Mould Setup and Defect Troubleshooting



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Introduction:

Plastics injection and blow moulding, from PET preforms and bottles to mould setup and defect troubleshooting, is a 5-day course for moulding process, mould shop and quality teams that ends with a Moulding Line Scrap Reduction and Mould Care Plan for a case packaging plant. Plants lose output when setters change several settings at once, wet PET reaches the barrel and moulds run with blocked vents. Nominees already run or set moulding and blowing machines, and learn through inspection walkthroughs of set-up sheets, moulds, preforms and defective containers. CoreConcept Training Center delivers this plastics injection and blow moulding course.

Course Objectives:

- Set up an injection moulding cycle and record a stable process window covering fill, pack and hold, screw recovery, cooling and ejection
- Inspect mould features including sprue, runners, gates, hot runner nozzles, cooling circuits, vents and ejector pins against part and cycle requirements
- Run scientific moulding studies such as the relative viscosity curve, cavity balance, gate seal and pressure-drop checks to fix machine settings with evidence
- Prepare PET for preform injection by controlling drying, melt temperature and residence time to protect intrinsic viscosity and limit acetaldehyde
- Adjust reheat stretch-blow and extrusion blow moulding settings, including oven heating profiles, preblow timing and parison wall control, to reach bottle and container specifications
- Diagnose moulded and blown container defects, rank scrap causes and set preventive mould care routines in a scrap reduction plan

Target Audience:

- Moulding process teams responsible for machine set-up sheets, cycle settings and process window records
 - Machine setting and shift production teams responsible for mould changes, start-ups and first-off approval
 - Preform and bottle blowing teams responsible for PET drying, oven profiles and container quality at the blower
 - Mould shop and tooling maintenance teams responsible for hot runners, cooling circuits, venting and mould records
 - Quality control teams responsible for preform and container inspection, defect classification and scrap reporting
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Course Outline:

Day 1: Moulding Floor Basics, Cycle Anatomy and Current Scrap Review

- Injection Moulding Machine Units Clamp, Barrel, Screw and Nozzle
- Six-Stage Cycle Map From Mould Close to Ejection
- Blow Moulding Families Extrusion, Injection and Stretch Blow Compared
- Set-Up Sheet Review Against Actual Machine Readings
- Current Scrap Pareto by Defect, Mould and Shift

Day 2: Mould Design Elements and Scientific Moulding Method

- Sprue, Cold Runner and Gate Type Selection by Part
- Hot Runner Manifold, Valve Gates and Nozzle Heater Zones
- Cooling Circuit Layout, Flow Rate and Delta-T Checks
- Parting Line Vents and Ejector Pin Layout Inspection
- Decoupled Moulding Viscosity Curve, Gate Seal and Pressure-Drop Studies

Day 3: PET Preform Injection and Reheat Stretch-Blow Bottle Production

- PET Desiccant Drying Dew Point and Residence Time Control
- Preform Melt Temperature Settings to Limit Acetaldehyde and IV Loss
- Preform Crystallinity Haze Checks and Neck Finish Gauging
- Reheat Oven Lamp Profile and Preform Temperature Distribution
- Stretch Rod Speed, Preblow Timing and Final Blow Pressure

Day 4: Extrusion Blow Moulding, Defect Diagnosis and Mould Wear Risks

- Parison Wall Thickness Programming and Die Gap Adjustment
- Pinch-Off Weld Strength, Flash Trimming and Regrind Ratios
- Injected Part Defect Matrix Linking Symptom to Machine Setting
- Blown Bottle Defects Including Pearlescence, Off-Centre Gates and Thin Bases
- Hot Runner Leakage, Vent Blockage and Cooling Scale Failure Modes

Day 5: Inspection Walkthrough and Moulding Line Scrap Reduction and Mould Care Plan

- Case Plant Walkthrough of Injection, Preform and Blower Lines
 - Design of Experiments Trial Plan for a Recurring Defect
 - PFMEA Ranking of Scrap Causes With Containment Actions
 - Preventive Mould Care Schedule by Cycle Count and OEE Losses
 - Moulding Line Scrap Reduction and Mould Care Plan Completion
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Skills You Will Gain:

- Process Window Documentation
- Mould Feature Inspection
- Decoupled Moulding Study Execution
- PET Drying Control
- Stretch-Blow Oven Profiling
- Parison Wall Programming
- Moulding Defect Root Cause Analysis
- Preventive Mould Care Scheduling

Why Attend This Course:

- Deliver a Moulding Line Scrap Reduction and Mould Care Plan for a case packaging plant to the production manager and the mould shop lead
- Decide which single machine setting, drying condition or mould repair to change first when a defect appears, based on study data
- Avoid lost output, bottle rejections at the filler and unplanned mould pulls caused by wet resin, blocked vents and unbalanced cavities
- Coach setters and shift colleagues on set-up sheets, viscosity curve studies, oven profiles and defect matrices

Conclusion:

Back at the plant, the participant hands the Moulding Line Scrap Reduction and Mould Care Plan to the production manager, the mould shop lead and the quality supervisor, who use it to agree which defects to attack first, which moulds receive preventive care at which cycle counts and which set-up sheets to reissue. Setters use its defect matrices on running lines. After the first month under the plan, the unit should review scrap by defect and mould, unplanned mould pulls and changeover time, then update the process windows and care intervals.

Frequently Asked Questions FAQ:

What should participants know before a plastics injection and blow moulding course?

Participants should already operate, set or inspect injection moulding, preform or blowing machines. Basic reading of set-up sheets and part drawings is enough. Bringing anonymised set-up sheets, scrap reports or photos of defective parts and bottles makes the walkthrough exercises closer to their own lines.

How does a plastics injection and blow moulding course differ from a polymer technology or general manufacturing course?

It stays on the moulding floor: machine settings, mould features, PET preforms, bottle blowing, defects and mould care. Polymer technology courses focus on resin structure, grades and extrusion, while general manufacturing courses compare machining, casting, forming and moulding routes at design stage.

Why must PET be dried before plastics injection and blow moulding of preforms?

Moisture in PET breaks polymer chains during melting, which lowers intrinsic viscosity and makes preforms and bottles brittle. High melt temperature or long residence time also forms acetaldehyde, which affects taste, so drying and barrel settings are controlled together.

What do participants take back from the plastics injection and blow moulding course?

Participants take back a Moulding Line Scrap Reduction and Mould Care Plan for a case packaging plant, with a scrap Pareto, defect matrices for injected parts and blown containers, a trial plan, a PFMEA ranking and a preventive mould care schedule.
