MERCURY

Plastics Injection and Blow Moulding Technology Course

31 January – 4 February 2027
Cairo (Egypt)



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Plastics Injection and Blow Moulding Technology Course

Ref: 30_1082122 **Date:** 31 January – 4 February 2027 **Location:** Cairo (Egypt) **Fees:** 4000 Euro

The Plastics Injection and Blow Moulding Technology Course is a one-week professional course for production engineers, process technicians, and tooling specialists managing container and part forming operations. Working through scientific molding rheology curves, parison wall thickness profiling, and mechanical defect troubleshooting, you complete a Molding Process Setup and Defect Verification Package. Mercury Training Center delivers this course to establish repeatable shop-floor processing standards.

About This Course

Erratic process parameters, uncontrolled regrind ratios, and poor cycle stabilization cause container wall variation, cosmetic defects, and structural failures. To follow this course, you must already set basic machine temperatures, operate injection or blow molding machinery, and inspect plastic parts at work. Through guided exercises, you practice calculating scientific molding curves and stabilizing blow molding parison profiles.

Who It Is For

- Professionals responsible for establishing injection molding cycle parameters and troubleshooting dimensional defects on production lines
- Professionals responsible for setting parison extrusion thickness controls and cycle timing on blow molding equipment
- Professionals responsible for qualifying production molds, hot runner systems, and tooling maintenance procedures across the plant
- Professionals responsible for packaging quality control, drop testing validation, and physical container inspection protocols

This course is not for packaging graphic designers seeking label artwork training, nor is it for raw polymer synthesis chemists who require laboratory reactor formulation rather than shop-floor machinery operation.

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Competencies You Will Build

- Scientific Molding Setup: Determining viscosity curves, cavity balance metrics, and gate seal freeze times for stable processing.
- Parison Profile Control: Adjusting extrusion head programming and wall thickness distribution for uniform container strength.
- Resin Conditioning Management: Controlling polymer drying dew points and melt residence to prevent polymer degradation.
- Tooling and Venting Maintenance: Inspecting mold parting lines, runner balances, and cooling channel flow to prevent flashing and burn marks.
- Physical Package Testing: Conducting container drop impact resistance and dimensional tolerance checks to verify part integrity.
- Systematic Defect Troubleshooting: Identifying root causes for warpage, sink marks, short shots, and parison sag to minimize scrap.

What You Will Be Able to Do

By the end of the course you will be able to:

- From machine pressure and fill time data, construct relative viscosity rheology curves to identify the stable injection velocity window.
- Given multi-cavity weight measurements, calculate cavity balance percentages and adjust runner temperatures to achieve uniform part filling.
- Using container design drawings, program multi-point parison wall thickness profiles on extrusion blow molding machines.
- From laboratory moisture analysis reports, configure desiccant drying parameters to protect melt viscosity during stretch blow molding.
- Using ASTM D2463 test protocols, conduct container drop impact evaluations to confirm structural packaging compliance.
- From defective part samples, isolate tooling, thermal, and pressure variables to eliminate sink marks and parison flash.

Course Content

Day 1: Polymer Behavior and Scientific Injection Molding Principles

- Rheological Behavior and Relative Viscosity Curves for Polyolefin Resins
- Cavity Balance Analysis and Pressure Drop Investigations for Multi-Cavity Tools
- Gate Seal Studies and Pack-and-Hold Pressure Optimization
- Cooling Time Calculations and Mold Surface Heat Transfer Dynamics
- Resin Drying Dew Points and Intrinsic Viscosity Preservation

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Day 2: Injection Stretch Blow Molding and Preform Production

- Preform Injection Tooling, Hot Runner Balancing, and Gate Vestige Control
- Acetaldehyde Generation Prevention and Melt Residence Time Monitoring
- Stretch Rod Dynamics and Blow Pressure Sequencing in Two-Stage Systems
- Infrared Oven Reheat Profiling and Preform Temperature Distribution
- Visual Defect Diagnostics for Preforms and Blown Containers

Day 3: Extrusion Blow Molding and Parison Optimization

- Extruder Screw Geometry and Melt Homogenization for Blow Molding Grades
- Multi-Point Electronic Parison Wall Thickness Programming
- Die Head Tooling, Mandrel Bushing Alignment, and Parison Sag Mitigation
- Mold Venting, Pinch-Off Land Geometry, and Flash Minimization Techniques
- In-Mold Cooling Channel Optimization for Uniform Container Shrinkage

Day 4: Quality Testing, Recycled Resins, and Tooling Maintenance

- Drop Impact Resistance Testing Conforming to ASTM D2463
- Dimensional Tolerance Verification Aligned with ASTM D2911/D2911M
- Processing Blends Containing Recycled Polyethylene and Polypropylene to ISO 18263-1
- Environmental Packaging Optimization Systems Following ISO 18602 and ISO 18604
- Preventive Maintenance Routines for Hot Runners, Slide Cores, and Blow Pins

Day 5: Production Process Validation and Work Product Finalization

- Exercise on In-Cavity Rheology and Gate Seal Determination for Industrial Casings
- Exercise on Parison Programming Adjustments for Rigid Chemical Jerrycans
- Exercise on Two-Stage Stretch Blow Reheat Optimization for Beverage Bottles
- Exercise on Root-Cause Troubleshooting for Part Warpage and Drop Test Failure
- Finalization of the Molding Process Setup and Defect Verification Package

Case Studies and Exercises

These suggested activities provide practical application of technical molding workflows across diverse industrial sectors:

- Case study: A consumer packaging facility where you adjust multi-point parison programming on high-density polyethylene bottles to resolve uneven corner wall thickness.
- Case study: A technical automotive supplier where you calculate cavity fill balance and gate freeze times on glass-filled polyamide components to resolve dimensional warpage.
- Exercise: An industrial container plant where you evaluate top-load crush test data and adjust mold cooling lines to prevent sidewall buckling.
- Exercise: A beverage bottling operation where you identify the root causes of preform haze and bottle base drop test failures by adjusting reheat oven lamps.

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What You Take Back

The Molding Process Setup and Defect Verification Package provides operational templates and diagnostic workflows for your first month back on the production floor. You will use it to standardize machine setup sheets, conduct data-driven mold qualifications, and resolve chronic molding defects without trial-and-error adjustments.

- Scientific molding setup worksheet containing viscosity graphing, gate seal study, and cavity balance calculation templates
- Parison programming and container wall thickness verification sheet for blow molding machines
- Defect resolution matrix linking visible part flaws to physical adjustments across heat, flow, pressure, and cooling
- Tooling preventive maintenance and mold venting inspection checklist

Quick Answers FAQ

What background is required before attending the Plastics Injection and Blow Moulding Technology Course?

You must have hands-on experience working around injection or blow molding machinery, setting operational barrel temperatures, and measuring manufactured plastic parts. Familiarity with basic machine interface controllers and standard workshop safety protocols ensures you can immediately apply the diagnostic exercises.

How does the Plastics Injection and Blow Moulding Technology Course differ from plastic part design courses?

Part design courses concentrate on computer-aided modeling, aesthetic shaping, and theoretical stress analysis. The Plastics Injection and Blow Moulding Technology Course focuses directly on machine operation, polymer rheology, parison programming, scientific molding data sheets, and tooling maintenance.

Why is scientific molding preferred over traditional machine adjustment?

Traditional adjustments rely on trial-and-error changes that vary by operator shift. Scientific molding separates machine set points from polymer physics by measuring melt viscosity, cavity balance, and gate seal times, creating a repeatable process window that survives resin lot variations.

What materials do participants take home from the Plastics Injection and Blow Moulding Technology Course?

You take home the completed Molding Process Setup and Defect Verification Package. This includes fill-time rheology templates, cavity balance sheets, parison profiling logs, and structured defect troubleshooting trees ready for machine-side deployment.

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For Your Manager

Your team member will return prepared to establish scientific molding practices, reduce cycle scrap, and eliminate machine downtime across injection and blow molding assets. By applying the Molding Process Setup and Defect Verification Package, they will standardize machine parameter sheets, validate tooling maintenance, and stabilize container wall thickness during upcoming production runs.