

Polymer Extrusion Process Engineering Training Course

10 – 14 January 2027
Doha

AGILE LEADERS
Training Center

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Overview

Polymer Extrusion Process Engineering Training Course is a one-week course for process, production, quality, and maintenance professionals who need an Extrusion Process Control File. Participants connect polymer rheology, material preparation, screw behavior, melting, mixing, die flow, downstream equipment, process settings, product quality, and troubleshooting. The course replaces isolated adjustments with a traceable process-window and evidence method for stable manufacture. Agile Leaders Training Center delivers this course on polymer extrusion process engineering.

Who Should Attend

- Functions responsible for extrusion process settings, throughput, and line stability
- Teams responsible for resin preparation, additives, drying, and material changes
- Personnel responsible for product dimensions, surfaces, testing, and release evidence
- Groups responsible for extruder maintenance, heaters, sensors, drives, screws, and dies
- Technical supervisors responsible for start-up, shutdown, deviations, and improvement

The course assumes participants already interpret production data and polymer-processing equipment, and it leaves out introductory polymer chemistry, live operating authorization, vendor certification, and polymerization reactor design.

Departments and Industries

The course supports extrusion operations across plastics, packaging, pipes, cable, sheet, film, profiles, compounding, and industrial manufacturing.

- Polymer process and production engineering departments
- Manufacturing operations and line-supervision teams
- Quality, laboratory, and product-development functions
- Mechanical, electrical, and instrumentation maintenance groups
- Packaging, construction-products, wire-and-cable, and consumer-goods plants
- Materials, procurement, and technical-assurance functions

Learning Objectives

By the end of this course, participants will be able to:

- Analyze polymer properties and material-preparation requirements
- Compare single-screw and twin-screw conveying behavior
- Use temperature, pressure, speed, torque, and throughput evidence
- Evaluate screw, die, and downstream process constraints
- Diagnose dimensional, surface, flow, and thermal defects
- Build a controlled extrusion operating window

Course Agenda

Day 1: Establish Material and Process Behavior

- Polymer Rheology and Melt-Behavior Map
- Resin Grade, Additive, and Regrind Input Register
- Moisture Sensitivity and Drying Requirement Matrix
- ISO 1133-1:2022 Melt-Flow Quality Evidence
- Extrusion Material Risk and Traceability Sheet

Day 2: Analyze the Extruder

- Single-Screw Feed, Compression, and Metering Zone Map
- Twin-Screw Element and Configuration Comparison
- Solids Conveying and Feed-Stability Worksheet
- Melting, Mixing, and Devolatilization Process Model
- Screw Speed, Torque, and Specific-Output Trend Chart

Day 3: Integrate Die and Downstream Equipment

- Screen Pack, Breaker Plate, and Melt-Pressure Record
- Die Flow Distribution and Pressure-Balance Method
- Cooling, Calibration, Haul-Off, and Cutting Interface Map
- Temperature Profile and Heater-Zone Performance Sheet
- Line Speed, Drawdown, and Dimensional Control Matrix

Day 4: Control Quality and Performance

- Extrusion Process Window and Control-Limit Chart
- Surface, Dimensional, and Melt-Fracture Defect Matrix
- Yield, Scrap, Changeover, and Material-Balance Dashboard
- Energy Intensity and Throughput Comparison Worksheet
- Start-Up, Shutdown, and Safe-Deviation Checklist

Day 5: Extrusion Process Practice

- Suggested Exercise: Validate Material and Drying Evidence
- Suggested Exercise: Interpret Screw and Melt-Pressure Trends
- Suggested Exercise: Diagnose Die and Product Defects
- Suggested Exercise: Balance Quality, Throughput, Yield, and Energy
- Capstone Exercise: Produce an Extrusion Process Control File

Practical Exercises

The course uses suggested activities to convert line data and product evidence into controlled extrusion decisions.

- Suggested activity: compare resin, additive, moisture, and melt-flow evidence before a grade change
- Suggested activity: trace feed, melting, mixing, pressure, die, cooling, and haul-off behavior across a process deviation
- Suggested activity: distinguish material, heater, screw, die, and downstream causes of dimensional or surface defects
- Suggested activity: document a stable process window with escalation and safe operating boundaries

FAQs

Who suits polymer extrusion process engineering training and what does it assume?

Polymer extrusion process engineering training suits professionals who already monitor extrusion lines, product quality, materials, or maintenance evidence. It assumes familiarity with industrial production data and basic polymer-processing equipment.

How does polymer extrusion training differ from polymerization production training?

Polymer extrusion training focuses on converting thermoplastic material through feeding, melting, mixing, die shaping, cooling, and downstream control. Polymerization production training focuses on creating polymer resin through reaction chemistry and reactor operation.

How are temperature, pressure, screw speed, and torque used in extrusion troubleshooting?

Temperature, pressure, screw speed, and torque are compared as linked trends to identify feed instability, melting limits, excessive resistance, mixing changes, die restrictions, equipment wear, or an unsuitable operating window.

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What causes dimensional and surface defects in polymer extrusion?

Dimensional and surface defects can result from material variation, moisture, unstable feeding, melt-temperature changes, pressure fluctuation, screw or die condition, cooling imbalance, haul-off variation, or mismatched line speed.

Conclusion

Participants take back an Extrusion Process Control File containing material inputs, operating trends, equipment interfaces, process windows, quality evidence, defect logic, and improvement actions. The file makes line decisions and assumptions visible for review. It supports controlled start-up, stable production, structured troubleshooting, and documented handover.