





ProEx 1 Extrusion

Seminar outline

CERTIFICATION SEMINAR Duration - 5Days

Paulson's comprehensive, real-world ProEx 1 **Extrusion seminar** offers immediately actionable skills for extrusion production floor personnel at any level of experience. Gain critical knowledge and skills, thorough understanding the extrusion process from a scientific point of view

Day 1

Introductions
Quiz for Benchmarking
Course Goals
Module 1 – Brief History of the Origin of Plastics
Module 2 – The Structure of Plastic Raw Materials
Polymerization
Molecular Weight & Molecular Weight
Distribution
Thermoplastics and Thermosets
Polymer Structure
Crystalline and Amorphous Structures &
Processing Requirements
Module 3 – The Characteristics of Plastics for Extrusion
Homopolymers, Copolymers and Terpolymers
Blends and Alloys
Raw Material Forms



Plastic Degradation
Additives
Moisture in Plastic
Contamination
Module 4 – The Effects of Pressure, Temperature and Flow
Plastic Flow Behavior
Molecular Orientation
Viscosity
Fluid Flow Behavior – Types of Fluid Flow
Measuring Plastic Flow Behavior
Effects of Additives and Regrind on Viscosity

Day 2

Module 5 – The Single Screw Extruder – Parts and Operation	
	Parts of the Single Screw Extruder
	Screen Pack
	Die Manifolds/Adaptors
	Extruder Valve
	The Extrusion Process
Module 6 - Extrusion (Gear) Melt Pump Parts and Operatio	
	Why a Melt Pump?
	Parts of the Melt Pump
	Operation and Control of Melt Pump
Module 7 – Optimizing Extruder Controls – Part One	
	Process Variables
	Plastic Raw Material Properties
	Plastic Flow in the Hopper
	Plastic Behavior in the Feed Zone
	How Plastic Melts and Flows
Module 8 – Optimizing Extruder Controls – Part Two	
	The Compression/Transition Zone and Operating
Variables in th	lat zone
	The Metering Zone and Operating Variables in
that zone	

Day 3

Module 9 – The Sheet Extrusion Line: Parts and Operation Sheet Thicknesses and Uses



Parts of the Sheet Line	
Module 10 – Sheet Extrusion Dies	
Sizes and Construction	
Parts of the Sheet Die and Assembly	
Sheet Die Temperature Control	
Restrictor Bar	
Die Lips and Die Gap	
Deckle Bars	
Plastic Behavior and Flow in the Die	
Care of Dies	
Module 11 – Controlling Plastic Flow in the Die	
Manifold Designs	
Controlling Plastic Flow Through Die Adjustments	
Module 12 – Coextrusion	
Definition	
Methods	
Module 13 – The Roll Stack	
Purpose	
Designs	
Drive, Nip and Roll Gap	
Roll Finish, Construction, Temperature Control	
and Cooling Capacity	

Day 4

Module 14 – After the Roll Stack Trimmers Gauging System Secondary Cooling Static Discharge

Module 15 – Plastic Behavior in the Sheet Extrusion Line Plastic Leaving the Die Plastic Travel Through the Roll Stack Pressure on the Plastic in the Roll Gap Cooling Uniaxial and Biaxial Orientation Control of the Sheet Line Module 16 – Safety, Pre-Start and Start-up Procedures Importance of Safety Potential Hazards Pre-Start Procedures



Start-Up Steady State Procedures Module 17 – Steady State Operation, Shutdown, and Maintenance Procedures Steady State Operations Shutdown Procedures Emergency Shutdown and Startup After an Emergency Shutdown

Day 5

Module 18 – Single Screw Extruder Sheet Extrusion Troubleshooting Set-up Sheet Basic Steps Common Extrusion Problems Final Exam and Review

Note: There are reviews at the end of each module and an overall review prior to the final exam.

Paulson Plastics Academy, a division of Paulson Training Programs, Inc., is the place to learn both the fundamentals and advanced strategies of plastics manufacturing and scientific injection molding in an expert instructor led classroom environment. Classes are vendor-neutral and culminate in a powerful certification to help each attendee go further in their career. Each seminar teaches how to optimize plastics processing for injection molders, extruders, blow molders or thermoformers.

Seminars are held in multiple, state-of-the-art technical facilities nationwide including: Arburg, MGS, Toshiba-Shibaura, Polymer Center of Excellence, MoldTrax, and Hennepin. Explore and learn how you can become a skilled plastics processor.

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