

# Paulson ProMolder 2™ – Seminar Outline

## Duration

5 Days

## Certification

Graduates will be Certified in the knowledge of Injection Molding “from the plastic’s point of view,” will understand the “why” behind the injection molding process, and confidently and safely use the right systems and data to make production floor decisions before changing settings on the molding machines.

**Paulson ProMolder 2™** is an advanced injection molding course designed to develop injection molding experts by providing classroom knowledge, computer simulation, and hands-on molding experience. All Paulson seminars and courseware are vendor neutral. Paulson teaches processing “from the plastic’s point of view.” Whether you use Scientific Molding or DeCoupled Molding™ or a hybrid system in your plant, this seminar will dramatically increase your results.

## Who should attend?

Technicians, Setup, Setup Personnel, Lead Persons, Foremen, Process Engineers, and others who are, or will become, key production personnel in the future.

## What you will learn.

When you complete this course you will be able to:

- Understand the complex relationships between the molding machine controls
- Understand plastic processing conditions in the mold and resultant molded part properties
- Obtain practical hands-on application experience in machine settings
- How to optimize processing for maximum profit
- Solve molded part problems quickly and optimally
- Fully prepared & pre-qualified to enroll in Paulson’s ProMolder 3™ seminar, Paulson’s most advanced level of certification.

## Why earn a Paulson Certification?

Paulson Training Programs has an industry-leading 35 year reputation for developing highly qualified injection molding personnel who are sought after by the top injection molding companies. To maintain this quality, we test each student at the end of the course with a written exam. Based on final scores, each participant earns one of three levels of Certification **Paulson Gold Certificate of Achievement**; **Paulson Silver Certificate of Achievement**; and a **Paulson Certificate of Completion**.

## Pre-Requisite

Prerequisite to enroll in ProMolder 2 includes satisfactory completion of the Paulson ProMolder 1 seminar or the equivalent Paulson CD or web-based training (call for details). Exceptions to these prerequisites can be made and others having molding experience may attend this course by passing a pre-assessment test administered by Paulson.

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## Paulson ProMolder™ 2 Seminar Outline

Here is a day-by-day outline of the topics that you will learn in Paulson's **ProMolder™ 2** injection molding seminar.

You will leave **ProMolder™ 2** with an advanced understanding of setting up and optimizing an injection molding process. You will have excellent problem solving knowledge which allows you to analyze and correct any part defect using Paulson's proven *plastic's point of view* methodology.

You will have a firm foundation of knowledge on which you will build and share with your colleagues back at your plant. You are also fully prepared and pre-qualified to enroll in Paulson's **ProMolder™ 3** seminar, our most advanced level of certification.

**ProMolder™ 2** will introduce you to the machine, the mold, the materials, the machine controls and the foundational concepts of injection molding from the *plastic's point of view* and the 4 primary processing variables – *heat, flow, pressure, and cooling*. This proven learning method was pioneered by Paulson in the 1970's and remain the industry standard today.

### The main topics covered during this intensive 5-day seminar include:

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#### Day 1

- **ProMolder 2™ Pre-Test** (to assess current level of knowledge and skills)
- Review All **ProMolder™ 1** Material
- The Basics Principles of Injection Molding
- Raw Material Issues Encountered When Molding Plastic
- Understanding the Internal Structure of Molded Part – Molecular Arrangement Overview
- Crystalline Structure
- Amorphous Structure
- Molecular Orientation
- Analysis of Machine and Mold Operating Controls
  - The Hydraulic Injection Molding Machine
  - Electric Machine Ball Screw Drive Assembly
  - VPT – Velocity Pressure Transfer
  - The Machine Controls – How the Machine Controls Affect the Four Plastic Variables
- Review of the Common Types of Molds
- The Functions of the Mold

#### Day 2

- Math for Molders
  - Scientific Calculator Operation
  - Calculating Area, Clamp Force, Ratios, Percentages, Speed vs. Time
  - Maximum Average Pressure at Parting Line (without Flashing)
  - **Lab** - Comprehensive Problem Set of Machine Calculations for a typical molding job

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## Day 3

- The Four Primary Plastic Processing Variables
  - Plastic Melt Temperature
  - Plastic Flow Rate
  - Plastic Pressure
  - Plastic Cooling Rate
- Molding From the Machine Point of View
  - Machine Controls vs. Part Properties
- Molding From the Plastic Point of View
  - Plastic Processing Conditions vs. Part Properties
  - Using Machine Controls to Determine Plastic Process Conditions.
  - Processing Strategies
- Understand the 13-Step Process to Build an Optimized Process
- *SimTech*™ – Virtual Injection Molding Machine Lab Workbook Lesson
  - How to Apply the Four Plastic Variables to Solve Problems
  - Practical Application of Lesson Learned Regarding Plastic Behavior

## Day 4

- *SimTech*™ – Injection Molding Machine Simulator Lab Workbook Lessons (done in teams)
  - Case Study 1 – Apparent Viscosity Curve Exercise Using Semi-Crystalline Material
  - Case Study 2 – Apparent Viscosity Curve Exercise Using Amorphous Material
  - Case Study 3 – Optimize the Plastic Packing Pressure
  - Case Study 4 – Optimize the Gate Seal Time
  - Case Study 5 – Optimize the Cooling Rate Time
- Each Team Will Present Findings to Entire Class

# Paulson ProMolder 2™ – Seminar Outline

## Day 5

- Analysis of Part Problems from the Plastics Point of View (PPV)
- Plastic Melt Temperature
- Plastic Flow Rate
- Plastic Pressure in the cavity
- Plastic Cooling Rate
- **Lab** – Solving common molding problems – Problem Set
  - The Problem Stated
  - What Are the Potential Causes from the PPV?
  - What Plastic Condition(s) Should Be Changed (from the PPV)?
- Problem 1 – Part Dimensions Molding ABS (an amorphous plastic)
- Problem 2 – Part Dimension Molding Nylon (a semi-crystalline plastic)
- Problem 3 – Sink Marks
- Problem 4 – Voids
- Problem 5 – Part Cracking
- Problem 6 – Burn Marks

## Class Wrap-Up and Certification Exam

- **Final Class Review – Q & A with Full Class Participation**
- **Administer Final Test and Certification**
- **Graded Final Review with Full Class**

## Bring ProMolder 2™ to Your Plant

ProMolder 2™ is also available as a customized in-plant seminar. For more details visit:

[www.paulsonplasticsacademy.com/custom-on-site-seminars](http://www.paulsonplasticsacademy.com/custom-on-site-seminars) or call 800-826-1901.

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## About Paulson Plastics Academy

The **Paulson Plastics Academy (PPA)** is the division of Paulson Training Programs devoted to in-person, hands-on training. We offer expert instructor-led, vendor-neutral certification seminars that teach the fundamentals and advanced topics of injection molding, extrusion, and extrusion blow molding. The number of Plastics Academy graduates grows by hundreds each year. Whether you need a customized onsite seminar for your whole team or an instructor-led classroom experience for one or a few of your personnel, PPA can help you take the next steps on your journey to success. Contact us today to learn how we can help you get the most out of your training investment.

Register for a Paulson Plastics Academy seminar online or speak with an expert.

### Paulson Training Programs

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