



## **“MAKING PROPERTIES AND PROFITS”**

### **Twin-Screw Extrusion Seminar**

**March 6-7, 2012**

Seminar Leader: Adam Dreiblatt

Akron Polymer Training Center

Akron, OH

#### **Program Overview**

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This two-day seminar focuses on the application of intermeshing co-rotating extruders in polymer compounding applications. Training is directed towards machine operators, process engineers and supervisors as well as product development scientists in both research and manufacturing environments. **Participants are reminded that the goal of compounding is to produce properties, not pellets.** The goal of this seminar is to explain **how** twin-screw extruders create properties.

Interactions between screw design, raw materials and process parameters are presented in such a way that both experienced users and novices will benefit. Common unit operations are explained in practical terms with no prior knowledge or experience required. Upon completion of the training, participants will return to the workplace armed with techniques to improve quality, production rate and yield.

#### **Adam Dreiblatt**

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Adam has been involved with the practical aspects of twin-screw extrusion for over 30 years. He was formerly Manager of Process Development at Werner & Pfleiderer Corporation and Director of Manufacturing for the Novon Products Division of Warner-Lambert. Adam is now Director of Process Technology for CPM Century Extrusion, a global supplier of twin-screw extrusion equipment and replacement parts.

Adam has authored and presented numerous technical papers as well as published articles on various aspects of twin-screw extrusion. He has contributed several chapters in reference books including: “Screw Design,” Encyclopedia of Polymer Science and Engineering (John Wiley), “Intermeshing Co-rotating Twin Screw Extruders,” Mixing in Polymer Processing (Marcel Dekker), “Internal Mixers, Single and Twin Screw Extruders,” Handbook of Process Plant Machinery (Butterworth Publishing). Adam holds a M.S. in Applied Science from New York University.

#### **Akron Polymer Training Center**

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The Akron Polymer Training Center provides workforce development for the rubber and plastics industry. World-class training seminars and workshops are presented by instructors from industry who bring practical experience to the classroom. Courses are offered in rubber compounding, formulating and testing as well as plastics injection molding.

***The 18,500 square foot Training Center houses three classrooms, a polymer processing laboratory, a computer lab and a laboratory devoted to physical and dynamic properties testing.***



## Seminar Program

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**Tuesday, March 6, 2012, 8:30 a.m. - 5:00 p.m.**

### **Twin-Screw Extruder Design**

- Introduce concepts responsible for creating properties on co-rotating twin screw extruders
  - Degree-of-fill, shear rate, residence time/residence time distribution, heat transfer
  - Dispersive vs. distributive mixing
- Influence of extruder configuration on compounding performance
  - How machine design impacts mixing (e.g.  $d_o/d_i$ , co versus counter rotation, etc.)
  - What is optimum extruder configuration?

### ***Lunch break***

### **Process Design**

- Description of unit operations: feeding, melting, mixing, venting, pressurization
- Introduction of the process model – role of specific energy
- Interaction of process parameters
- Process optimization

**Wednesday, March 7, 2012, 8:30 a.m. - 5:00 p.m.**

### **The “Art” of Screw Design**

- Functional description of the working principles for each element type (conveying, mixing)
- Overview of available screw element designs
- Characterization of dispersive and distributive mixing elements
- Selection of the optimum screw type for each of the unit operations
- Examination and analysis of typical compounding screw configurations
  - Masterbatch, concentrates
  - Non-reinforcing fillers
  - Fiber compounding
  - Liquid additives

### ***Lunch break***

### **Industry Best Practices**

- Guidelines for set-up, operation and maintenance of your twin-screw equipment

### **Process Troubleshooting**

- Diagnosis of compounding instabilities with respect to residence time
  - Consistency (i.e. within-lot)
  - Reproducibility (i.e. lot-to-lot)

*Bring your current processing problems or screw configuration questions to discuss privately with the instructor...this alone can justify the seminar fee!*

*Participants will return to the workplace prepared to design and optimize screw configurations as well as develop operating conditions to meet compound specifications.*



## **General Information**

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**Location:** The seminar will be held at the Akron Polymer Training Center (APTC), 225 East Mill Street, Akron, Ohio (330) 972-8661.

**Hotel Reservations:** Attendees are responsible for making their own lodging arrangements. The Ramada Plaza Hotel (formerly Akron City Center Hotel) is within a few minutes drive. Please identify yourself as an “Akron University, Polymer Training Center” attendee when making reservations.

**Time:** Seminar hours are from 8:30 a.m. to 5:00 p.m. on March 6 and 7. The Akron Polymer Training Center will provide continental breakfast in the morning, lunch and refreshments each day.

**Cancellations:** If you must cancel, call APTC’s Seminar Registrar, Tayba Tahir at (330) 972-8661. She will assign you a cancellation code number. You will need this number for verification and to receive a refund or to transfer to another seminar. You may cancel your registration for a full refund up to March 1, 2012 less a \$30 processing fee. **REGISTRANTS WHO FAIL TO ATTEND ARE LIABLE FOR THE ENTIRE FEE UNLESS THEY CONTACT APTC PRIOR TO THE SEMINAR TO CANCEL.**

APTC reserves the right to cancel a workshop or substitute instructors. If APTC should cancel, they will call that phone number which the attendee has given APTC as the contact, no later than 10 days prior to the workshop. You will receive a full refund if the workshop is cancelled. **APTC is not responsible for airline penalty fees or any other costs incurred by the attendee due to the cancellation of a seminar.**

## Registration Information

All registrations must be guaranteed by a purchase order number or a credit card (sorry, we cannot process charges to American Express). Checks should be made payable to **The Akron Polymer Training Center** and must include a copy of your registration.

### NOTE THAT SEMINAR FEES ARE DUE PRIOR TO ATTENDING.

All registrations whether by phone, fax or mail will be confirmed by mail and considered binding and subject to all cancellation policies. If you do not receive a confirmation by mail prior to the workshop, please call APTC to verify your registration.

Seminar fee includes classroom instruction, seminar manual, continental breakfast, lunches and refreshment breaks. It does not include hotel accommodations.

**To register by phone:** Call APTC's Seminar Registrar, Tayba Tahir (330) 972-8661.

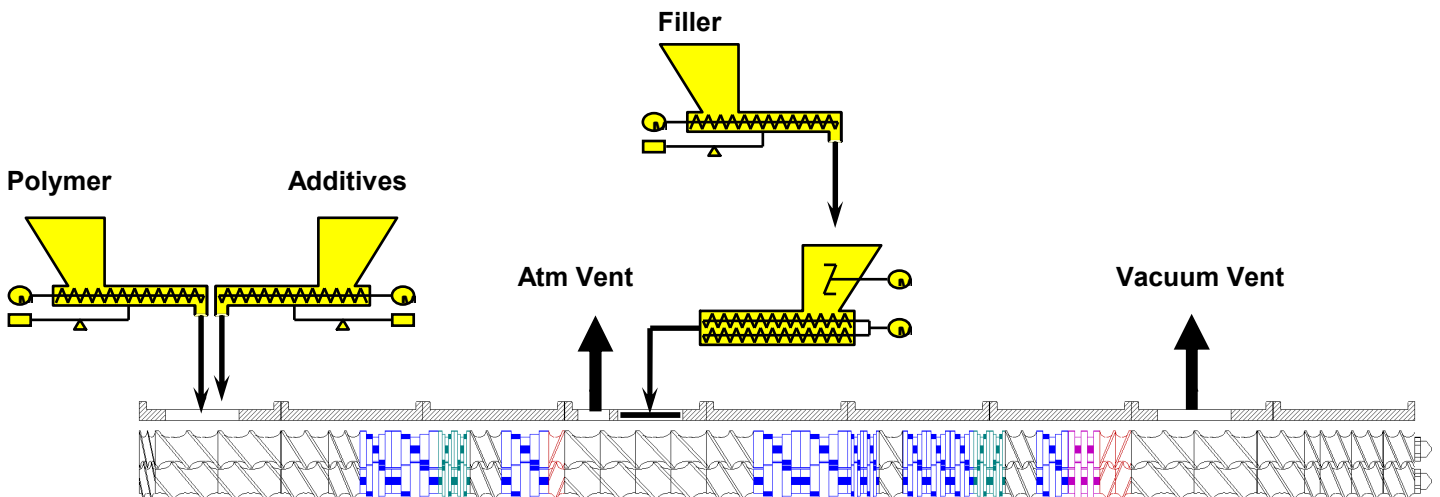
**Akron Polymer Training Center website:** <http://www2.uakron.edu/aptc/>

**To register by fax:** Send copy of Purchase Order by fax to (330) 374-8789. All registrations must include credit card information, check, or a purchase order number.

**To register by mail:** Send completed registration form to Akron Polymer Training Center, Attn: Tayba Tahir, 225 East Mill Street, Akron, OH 44325-5404 with a purchase order number, check, or credit card information.

**ENROLLMENT IS LIMITED AND ON A FIRST-COME, FIRST-SERVE BASIS**

**EARLY REGISTRATION IS STRONGLY RECOMMENDED!**



**REGISTRATION FORM**  
**Twin Screw Extrusion Seminar**  
**March 6-7, 2012**  
**Akron, Ohio**

**All forms of registration must be guaranteed to a credit card or a purchase order number.**

To register: call APTC's Seminar Registrar, Tayba Tahir at (330) 972-8661, or fax the completed registration form to (330) 374-8789, or mail the form below with payment to:

**Akron Polymer Training Center**  
**225 East Mill Street, Akron, OH 44325-5404**  
**Attn: Tayba Tahir**

Name \_\_\_\_\_  
Company \_\_\_\_\_  
Title \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
Phone \_\_\_\_\_ Fax \_\_\_\_\_  
E-mail \_\_\_\_\_

**SEMINAR FEES**

**Seminar registration fee is \$ 875.00 per person**

*If you require special accommodations to fully participate, attach a description of needs.*

**SAVE! Company registrations of three (3) or more save 10% each**

**PAYMENT INSTRUCTIONS**

**SEMINAR FEES ARE DUE PRIOR TO ATTENDING.** Please indicate method of guarantee or payment. Make checks (in U.S. dollars) payable to The Akron Polymer Training Center and send with registration.

Check Amount \$ \_\_\_\_\_ Check # \_\_\_\_\_

P O # \_\_\_\_\_ Amount \$ \_\_\_\_\_

VISA       MC       To guarantee       To charge

Account # \_\_\_\_\_ Exp. Date \_\_\_\_\_

Cardholder's name \_\_\_\_\_ Today's date \_\_\_\_\_