

Post-Conference Event

International Training Program / Workshop (TechnoBiz)

Improving Extrusion Process Efficiency

3 April 2010, Impiana KLCC Hotel, Kuala Lumpur, Malaysia

This one-day training program is for people involved in actual extrusion operations that want to learn how to make the process more efficient. The introduction will cover nomenclature, types of extruders, new developments, and instrumentation. Efficient extrusion starts with a discussion on how to assess the efficiency of existing extrusion operations. This is followed by machine design, setup, and operation. Efficient machine design will cover screw design, die design, hopper and feed housing design, heating and cooling. Machine setup will include maintenance, process monitoring, and statistical process control. Machine operation will address feeding methods, heating and cooling, and process control. Product changeover and purging techniques will be discussed in detail. Methods to reduce material cost and energy consumption will be presented with examples of the potential financial impact. Optimizing extruder barrel temperatures will be discussed and, finally, flexible manufacturing methods for extrusion will be covered. Examples of improving efficiency of actual extrusion operations will be discussed throughout the seminar.

Program Outline

Introduction to Extrusion

- Nomenclature
- Different types of extruders
 - Ram extruders
 - Disk extruders
 - Screw extruders
- Basics of extrusion in a nutshell
 - What is plastic extrusion?
 - What are plastics?
 - What happens inside the extruder?
- New developments in extrusion
 - Ultra high speed extrusion
 - High efficiency degassing extruders
- Instrumentation and control
 - The vital signs of the extruder
 - How to measure pressure and temperature
- Efficient machine operation
 - Methods of feeding
 - Why cooling should be minimized
 - Close-loop control
 - Total line control
- Efficient machine setup
 - Preventive maintenance
 - Instrumentation and process monitoring
 - Data acquisition capability
 - Statistical process control
- Product changeover and purging
 - Machine design for quick changeover
 - Running resins with different viscosities
 - Running resins with different colors
 - Purging techniques
 - Purging compounds

Efficient Extrusion

- How to assess efficiency of an existing extrusion operation
 - Yield
 - Scrap rate
 - Process capability
 - Etc.
- Efficient machine design
 - Screw design
 - Die design
 - Hopper and feed housing design
 - Heating and cooling of the extruder
- Reducing material cost
 - Low cost filler
 - Recycled plastic
 - Foamed plastic
 - Polymer processing aids
- Reducing energy consumption
 - How to determine the energy efficiency of the extruder
 - Preheating in drier
 - Discharge melt temperature
 - Thermal insulation of machine parts

- Efficient troubleshooting
 - Requirements for efficient troubleshooting
 - Troubleshooting tools
 - Typical extrusion problems
- Optimizing extruder barrel temperatures
 - Design of experiments
 - One-at-a-time experiments
 - Dynamic optimization
- Flexible manufacturing methods, examples
 - Quick-change extrusion systems
 - Adjustable calibrators
 - Continuous die gap adjustment
 - Internal pipe cooling

Who should attend this course?

- Operating personnel such as extruder operators, technicians, setup people, supervisors, etc.
- People involved in extruder maintenance and repair
- Process engineers and manufacturing engineers involved in extrusion operations
- People responsible for buying new extrusion equipment and upgrading existing extrusion equipment
- People responsible for extrusion operations such as manufacturing managers, plant managers, operation managers, etc.
- Engineers responsible for the design of extrusion equipment (OEMs) or components (screw manufacturers, die manufacturers)
- Technical service personnel from resin producers and extruder manufacturers that need to solve extrusion problems and perform process optimization

Program Instructor – Dr. Chris Rauwendaal

Dr. Chris Rauwendaal - President of Rauwendaal Extrusion Engineering, Inc. since 1990; previously with American Enka Company and Raychem Corporation. *Chris* received a M.Sc. from Delft University and a Doctorate in Polymer Processing from Twente University in the Netherlands. *Chris* is a well-known author, lecturer, entrepreneur, and consultant in the field of extrusion. He holds numerous patents and has written more than 200 articles and seven books related to extrusion, mixing, injection molding, and statistical process control. *Chris* has developed video training courses and interactive training programs on extrusion, injection molding, and SPC. He has been involved in technical meetings of the SPE and PPS for many years as a speaker as well as a technical program chairman. *Chris* is a Fellow of the Society of Plastics Engineers. *Chris* is the developer of the CRD and VIP mixing technology that utilizes strong elongational flow to improve mixing in extrusion and molding. CRD mixing devices are successfully used in many extrusion operations. VIP mixers were recently introduced to the plastics processing industry and are gaining rapid acceptance. Work is ongoing to extend this technology to a new generation of extruders and injection molding machines. The most recent development is the HHT (high heat transfer) extruder screw developed to improve cooling in foam tandem extrusion operations.

Registration Fee

- 400 US\$ / Person (before 31 January 2010)
- 500 US\$ / Person (after 31 January 2010)

Registration fee includes training documentation, lunch and refreshments

<p>Program Agenda: 09.00 – 17.00</p>

<p>Language: ENGLISH</p>

For more information, please contact

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