Foam Extrusion Seminar, May 23-25, 2012

Basic Principles
- Mechanical properties of foams
  - Std time behavior: stiffness, strength
  - Long time behavior: creep, fatigue
  - Short time behavior: impact
- Foamable polymers
  - Morphological characteristics
  - Characteristics of important resins
- Additives
- Cell stabilizers
- Other agents
- Nucleating agents
- Foaming agents
- Chemical : exo- and endo-thermics
  - Physical: atmospheric, hydrocarbons, HCFCs
  - Solubility and diffusivity
- Rheology of gas-laden melts
  - Bubble mechanics
  - Why does a foam stop growing?
  - And why does it shrink?
  - Open-celled foams

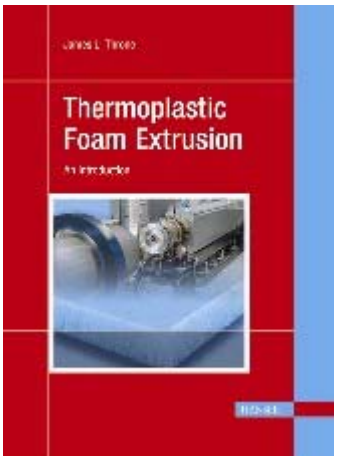
Foaming Agents
- Natural Fiber Foam Composites
  - Polymer Structures
  - Process of Manufacturing
  - Pressurization
  - Cooling and Mixing
  - Role of Cellular Structures
  - Fine Cellular Structure
  - Chemistry of the Foaming Agent
  - Die Configuration and Extrusion

- Foaming Agent Process and Performance
  - Introduction
  - Foaming Agent Technologies
  - Endothermic & Exothermic Foaming Agents
  - Gases & Nucleation
  - Elastomeric Foam Design
  - What 's happening in the Barrel?
  - Blowing Agent Compatibility
  - Blowing Agent Process
  - Properties of Foam Articles
  - Process Improvement using CO2
  - Open Cell Foam
  - Foaming agent studies
  - Foaming agents in IM & Extrusion
  - New Equipment Technologies

Hardware
- Twin vs. single screw extruders
- Single- vs. two-stage process
- Screw design for foam extrusion
- Melt temperature distribution
- Die design for foam extrusion
- High vs. low density foam products
- Free foaming method
- Constrained foaming method
- Microcellular foam extrusion
- Coextrusion

Thermoformability of Low-Density Thin-Gauge Sheet
- Material-Specific Die Design for Thin-Gauge Shee
- Temperature-Dependent Internal Cell Gas Pressure During Cooling
- The Role of Sheet Aging Prior to Thermoforming
- Factors Influencing Secondary Foam Expansion During Reheating
- Internal Cell Gas Pressure
- Temperature-Dependent Tensile Modulus
- Processing Factors Influencing Catastrophic Cell Collapse

Troubleshooting
- Requirements
- Tools for troubleshooting
- Systematic troubleshooting
- Extrusion instabilities
  - Frequency of instability
  - Functional instabilities
  - Solving extrusion instabilities
- Computer aided troubleshooting
- Case studies
  - Wear problems
  - Mixing problems
  - Irregular cell structure
  - Dimensional variation



Book authored by James L. Throne:

Thermoplastic Foam Extrusion is available with foam seminar registration for a discounted price of $70.00. Please check TPE book box on registration form if you desire to purchase the book.

Books authored by Chris Rauwendaal:
- Polymer Extrusion available with registration in any seminar for a discounted price of $105.00
- Understanding Extrusion
- Troubleshooting the Extrusion Process
- SPC in Injection Molding and Extrusion
- Polymer Mixing
- Mixing in Polymer Processing

Books are offered at a discount only if ordered with a seminar and will be delivered at the seminar.

The course fees are:	Prior to April 20	April 21-May 4	After May 4
Blown Film Troubleshooting:	$795.00	$850.00	$950.00
Sheet Extrusion:	$795.00	$850.00	$950.00
Foam Extrusion:	$1095.00	$1145.00	$1245.00
If taking 2 courses:	-$100.00	-$100.00	-$100.00
3rd attendee discount (5%):			
Understanding Book ($60.00)			
Troubleshooting Book ($105.00)			
Polymer Extrusion ($105.00)			
Polymer Mixing ($70.00)			
SPC in Injection Molding and Extrusion ($105.00)			
Thermoplastic Foam Extrusion ($70.00)			
A Practical Guide to Blown Film Troubleshooting ($125.00)			
Total:			

A 5% discount will be given for the 3rd and up attendees from the same company. The course fees include lunch for each day and the handout material.

Cancellations: A refund, less $100.00 cancellation fee, will be made if the registration is cancelled in writing by or on April 20, 2012. REE Inc. reserves the right to cancel one or more seminars or substitute instructors. Should this occur the attendees will be notified. We do not rake any responsibility for penalty fees or any other cost that may be incurred due to cancellation. We recommend that you book travel with refundable fares. Registrants who fail to attend are liable for the fees of the course registered for.

Fax registration to: 530-269-1084 or register online at www.rauwendaal.com

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