

International Training Program (TechnoBiz)

Blow Molding Process

Understanding, Process Improvement & Troubleshooting

23-24 April 2009, Bangkok
27-28 April 2009, Kuala Lumpur

This 2-day training program is aimed for blow molding companies. This course focuses on ways to improve process operation to prevent process failures and improve product quality. This course is useful engineers, factory managers, and technical service department personnel in plastic industry.

Program Content

Session 1: Fundamentals of Blow Molding

1. The purpose of blow molding
 - a. Forming hollow articles
 - b. Single surface mold forming
2. The blow molding process block diagram
 - a. Resin preparation
 - b. Plasticating and melting
 - c. Shaping the melt via extrusion or injection molding
 - d. Blowing
 - e. Cooling
3. The blow molding processes
 - a. Container blow molding
 - i. Extrusion blow molding
 - ii. IBM (injection blow molding)
 - iii. IBSM (injection stretch blow molding)
 - iv. IRSBM (injection reheat stretch blow molding)
 - b. Industrial blow molding
 - i. Extrusion blow molding
 - c. Multi layers
4. Basic machinery elements
 - a. Extrusion (Continuous extrusion /Wheel systems /Intermitted extrusion/Accumulator systems)
 - b. One step machinery (IBM /ISBM)

- c. Two step machinery
 - i. Preform injection
 - ii. RSBM
 5. Fundamental elements of quality
 - a. Function
 - b. Shape (Dimension /Thickness)
 - c. Performance (Mechanical/Physical/Visual)
 6. Review of secondary processes
 - a. Decorating and labeling
 - b. Added components

Session 2 : General Process Improvement Issues

7. Preparation for Job Change
 - a. Change check list
 - b. Tooling (molds and machine components, maintenance, storage and staging) – enabling visual availability checks
 - c. Technicians work tools and special tools
 - d. Materials (resin or color changes)
 - e. Shut down leading to job change and preproduction systems start up i.e. drying)
8. The use of regrind and post consumer materials
 - a. Effect on properties

- b. Processing requirements (Particle size / Mix ratio/Grinding and dust /Re-pelletizing /Extruder operations – stability)
9. Multi mold problem analysis
- a. Top level frequency analysis
 - b. Back to the mold tracing (blow mold, injection molding – cavity location)
 - c. Correlation to production event log
 - d. On line test equipment performance verifications (retesting)

10. Mold Cooling and Venting

A.. Cooling

- a. Coolant flow
 - i. Thickness effect on cooling
 - ii. Mold flow path (single path vs. parallel circuits)
 - iii. Priority areas (first flow)
 - iv. Flow rate (Re Reynolds number)
 - v. Temperature and temperature drop
 - vi. Pressure and pressure drops
- b. Coolant use at different operating temperature (anti-freeze)
 - i. Effect on flow
 - ii. Effect on cooling capability

B. Venting

- c. Venting needs in critical mold areas (options)
- d. Vent mark on the products (channel depth at surface and sub-surface)
- e. Vent maintenance

11. Coloring

- a. Color uniformity
- b. Streaking
- c. Concentrate types and loading effects
- d. Screw mixing capabilities

Session 3 : Extrusion Blow Molding

12. Weight variation

- a. Material flow causes (Feed and extrusion stability / Color and additive matrix base)
- b. Temperature control (Controller gain and derivative settings /Air or liquid cooling)

13. Parison related issues

- a. Weight distribution (g per cm.)
- b. Concentricity
- c. Non round tooling (alignment)
- d. Curling (tooling and temperature)
- e. Programming (stability and timing)
- f. swell and memory effects (dependence on flow rate and temperature v. parison strength)

14. Extrusion blow molding mold maintenance

- a. Pinching surfaces
- b. Striking plate
- c. Finish neck tooling

Session 4: PET Blow Molding issues

15. Preform quality

- a. Concentricity (checking for concentricity)
- b. Gate crystallinity
- c. defect charts (use of cross polarized box)
- d. Contamination
- e. Stringing
- f. Gate holes
- g. Reheating surface crystallinity

16. Bottle performance

- a. CSD
 - i. Orientation (preform temperature)
 - ii. Stress whitening (crazing)
- b. Heat set/hot fill bottles
 - iii. Crystallinity levels
 - iv. Focced cooling (timing and costs)
 - v. Heat haze
 - vi. Detail definition
- 3. Finish deformation (reheat oven finish protection)

17. IBM linear manifolds

- a. Flow balancing (Flow length / Over packing)

18. Machine issues

- 1. Blow valve timing
- 2. Preform turning in oven
- 3. Preform loading/ seating
- 4. Preform pinching in blow molds
- 5. Air leaks (effect on bottle volume)
- 6. Bent stretch rods
- 7. parting line quality

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Course Instructor : Dr. Dan Weissmann, USA



Dr. Dan Weissmann is the principal of DW & Associates, US a consultancy specializing in Plastic and Packaging. His blow molding career spans over 35 years with major involvement in the development of plastic bottles for the beverage industry. He has also worked in the areas custom extrusion and new plastic material development. Dr. Weissmann has published numerous articles and made many presentations as well as taught plastic technology. He is a regular contributor to Plastic in Packaging magazine.

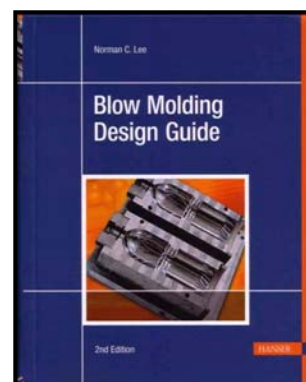
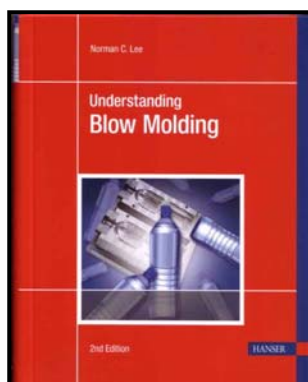
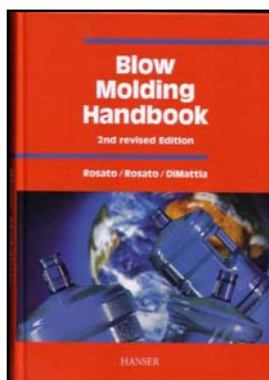
Registration Fee

- 500 US\$ (before 10 March 2009)
 650 US\$ (after 10 March 2009)

Registration Fee includes training documentation, refreshments and lunch break during training days.

Free Books for Delegates, who registers before 30 March 2009

Group Registration	Free Books
2 delegates from the same organization	1 Copy of Book ‘Understanding Blow Molding’
3 delegates from the same organization	1 Copy of Book ‘Understanding Blow Molding’ + 1 Copy of Book “Blow Molding Handbook”
5 delegates from the same organization	1 Copy of Book ‘Understanding Blow Molding’ + 1 Copy of Book “Blow Molding Handbook” + 1 Copy of Book “Blow Molding Design Guide”



Program Agenda: 08.30 am – 05.00 pm

Language: ENGLISH

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Registration Form

Instruction: Please fill all the information in English only

We would like to confirm to join

23-24 April 2009, Bangkok 27-28 April 2009, Kuala Lumpur

Organization Name

Address

Tel Fax Email

Contact Person Tel Email

Participant Name(s)

Participant 1: Position Email

Participant 2: Position Email

Participant 3: Position Email

Participant 4: Position Email

Registration Fee per Participant: 500 US\$ (before 10 March 2009) 650 US\$ (after 10 March 2009)

Payment Method

Cheque / Draft Payable to "TechnoBiz Communications Co., Ltd." payable on US Bank
Bank Transfer to Bangkok Bank PCL, Ratchada-Latphrao Road Branch, A/C No: 177-0-70727-9
A/C Name: TechnoBiz Communications Co., Ltd., Swift Code: BKKBTHBK
(Kindly make payment for all bank related charges)

Credit Card Visa Master Card
Card Number
Cardholder Name
Last 3 digits on signature panel Card Expiry Date
Signature of Cardholder
Date

Please send completed registration form

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