TAPPI LINERBOARD & MEDIUM MANUFACTURE
August 2 – 4, 2011
TAPPI Headquarters, Roswell, GA
PRELIMINARY COURSE SCHEDULE

Optional Introductory Day
Monday, August 1
1:00 – 5:00
Separate Registration Required
Overview of Corrugating
Overview of Tests & Properties
Overview of Pulp Mill Operations & Recycling
Overview of Stock Preparation
Overview of Paper Machine Operations

Day 1 Tuesday, August 2
8:00 – 9:00
Welcome , Introductions,
Learning Objectives

9:00 – 10:30
The Corrugating Process

- Double-Wall Corrugator Wet End Summary
  Identify main components of a Corrugated Web: Liner, Medium, Adhesive
- Lay-out of Equipment (Numbering/Stations)
- Corrugator Terms and Variables
  Single Face, Single , Double, Triple Wall Flutes
  Flute Pitch, Flute Height
  Types of Flutes
  Quality checks
  Materials
  Heat Transfer
  Construction of Box, Box Blank
  Mechanics of Bond
  Starch, Moisture, Heat, and Pressure
  Application,
  Wetting/Penetration,
  Gelatinization, Green-Bond,
  Drying/Fully Cured
  Single-face Bond
  Double-face Bond
- Starch
  Basics, Caustic, Borax, Raw Pearl Starch
  Quality Checks
  Viscosity
  Delivery Temp, Gel Temp - Procedure
  Stein Hall Cup Procedure
  Harper Love Cup Procedure
  Elcometer
  Applicator Roll – cell pattern, rider-roll, contact bar

10:30 – 12:00
Developments in Corrugating & Demands on Linerboard & Medium

- Changes in end use markets
  High graphic quality – shelf appeal
  Impacts on linerboard & printing requirements
- Mini and Micro Flute Corrugated
- Lower Basis Weights
- Corrugating Adhesives and Applicators
  Thin Film Applicator
  High solids adhesives
  Coated linerboard
  High graphic quality boxes
  Waxed corrugated
  Recyclable barrier coatings

12:00 – 1:00 LUNCH

1:00 – 4:00
Linerboard & Medium Performance Properties & Tests

- What happens to the Linerboard & Medium in the Corrugating process
  Sheet Structure & why it's important, MD/CD/Z, Formation
- Properties & Tests, what they are telling us, and what contributes to their values:
  Stiffness, Ring Crush, Mullen, Concora
  Edgewise Compression Test, STFI
  Tensile, Modulus, Stretch
  Liquid Absorption, Porosity, Adhesion
  Sizing tests, Cobb, Water drop, etc.
  Moisture & Humidity Effects on Performance Properties
  Causes of Curl, Warp, & Wash Boarding
  Viscoelastic Creep Failure of Boxes
  Runnability on the Corrugator

4:00 – 5:00
Printability, Developments in Printing & Demands on Linerboard & Medium

Preprint and Post Print
Linerboard surface requirements
Flexo process improvements
Photopolymer plates and packing materials
High definition halftones
Staccato screening
More colors
Digital printing of corrugated
High speed pigmented ink jet
Surface quality requirements

5:00 - Adjournment

Day 2 Wednesday, August 3

8:00 – 10:00

Improving Performance I : Fiber Raw Materials, Pulp Properties

- Fiber Properties & Effects on Sheet Structure
- Pulping Processes for Liner & Medium

10:00 – 11:00

Improving Performance II: Recycling

- Recycled Fiber Quality
- Stickies

11:00 – 12:00

Improving Performance III: Stock Prep Refining

- Refining mechanism
- Effects on sheet and properties
- Refining Measurements and Variables
- Improving Refining for Linerboard & Medium

12:00 – 1:00 LUNCH

1:00 – 4:00

Improving Performance III: Chemical Additives

- pH control
- Dry & Wet Strength
- Sizing
- Fillers
- Formation Aids, Retention
- Wet End Chemistry Improvement

4:00 – 5:00

Case Studies

- Chemical Additives & Effects
- Refining

5:00 Adjournment

Day 3 Thursday, August 4

8:00 - 11:00

Improving Performance IV: Paper Machine Wet End Operations

- Approach system
- Headbox operations
  Pressure/Hydraulic
  Importance of and Variables affecting
  Microturbulence Strategies
  Jet/Wire & MD/CD Orientation
  Structure CD, MD, Z Variations
  Headbox Crossflows & BW profile control
  TSI / TSO Analyses & Case Studies
- Sheet forming
  Dewatering
  Formation Improvement & Microturbulence
  Top Sheet Forming
  Twin Wire Gap Formers, Hybrid Formers

11:00 – 12:00

Improving Performance V : Machine Clothing

- Forming Fabrics
- Wet Press Fabrics
- Drying Fabrics

12:00 – 1:00 LUNCH

1:00 – 2:30

Improving Performance VI: Pressing, Drying, Calendering

- Pressing Mechanism of Water Removal; Effect on Sheet Properties
  Shoe Pressing & other developments
- Effects of Drying and Shrinkage & Moisture profile on Liner & Medium sheet & properties
- Types of calenders & variables affecting calendering
  Calender box surface treatments
  Winding

2:30 -3:45

Paper Machine Operations VI : Size Press & Other Surface Treatments

- Variables affecting pick up
- Developments in Size Press
- Surface Treatment Chemicals & Coatings to Improve Linerboard

3:45 Wrap up, evaluations
Adjournment