www.tappiplace.org

PLACE

POLYMERS • LAMINATIONS • ADHESIVES • COATINGS • EXTRUSIONS

2009 Consumer Packaging Solutions for Barrier Performance Course

Barrier Coatings for Flexible Packaging

Presented by:

Ginger Cushing

Business Development Manager

Michelman Inc.

Introduction

- Why solution coat instead of extrusion coating or film lamination?
  - Capital asset utilization, short runs
  - Apply thinner weights
  - Can formulate with a wide array of materials and achieve performance beyond extrusion resins.
- Brief overview of types of coatings: adhesives, heat seal, print receptivity, barrier
  - Solvent, solvent-free and aqueous

The Basics of Barrier Coating

- Types of barrier
  - Oxygen
  - Moisture
  - Flavor and aroma
  - Chemical resistance
  - Protection
    - Corrosion resistance
    - Heat, mar and scratch resistance

The Basics of Barrier Coating (cont.)

- Substrates
  - Paper, film, alu foil
  - Metalized
- Application: treatment, roll or rod coat, dry

Barrier Coatings

PVdC (Polyvinylidene Chloride)

- Purpose: excellent OTR, MVTR, heat sealable, used on film and paper
- apply about 1 – 3 g/m2 from 50% solids "latex"
- Pros: excellent barrier, inexpensive
- Cons: often need a primer for adhesion to film, discolors over time, environmental concerns

EVOH (Ethylene Vinyl Alcohol) and PVOH (Polyvinyl Alcohol)

- Purpose: oxygen barrier on film and paper
- Apply 1 gsm out of very low solids aqueous solution, dry thoroughly
- Pros: very good oxygen barrier possible
- Cons: may need a primer for film adhesion, humidity sensitive, low solids dispersions difficult to dry, EVOH solutions can be unstable, PVOH is very water soluble, bury within structure to protect from moisture


RITZ
CRACKERS
RITZ
CRACKERS


the Nut Factory
Spokane, Washington
Chocolate Mixed Nuts
19101

Waxes (Carnauba, Paraffin, Polyethylene)

- Purpose: moisture barrier, grease resistance, slip modification, scratch and mar resistance
- Apply 1 – 10 g/m2 from aqueous dispersion
- Pros: inexpensive, can be renewably sourced (carnauba), broad spectrum of properties available through wax selection
- Cons: poor adhesion, bloom and offset onto machine parts


3612
DATE
BUTTER
CANADA

EAA (Polyethylene Acrylic Acid)

- Purpose: primer for extrusion coating or topcoat on aluminum foil to protect from corrosion and delamination by aggressive consumer products
- Apply 0.1 – 1 g/m2 to aluminum foil from aqueous dispersion
- Pros: high acid contributes barrier beyond extruded grades of EAA, strong adhesion to aluminum foil, good coupling agent for foil/PE extrusion
- Cons: Won't hold up to the "worst:" Povidone iodine, tooth paste, liniment


HONEY

Acrylics (and others)

- Purpose: topcoat or overprint varnish for all substrates to protect from physical abuse, frictional heat from converting and filling processes. Facilitates release from heat seal jaws.
- Apply 0.5 – 3 g/m2 from aqueous or solvent based dispersion
- Pros: Easy to use, good properties, can be modified for matte or gloss appearance.
- Cons: higher performance versions can be expensive

Other Barrier Coatings

- SiOx
- AlOx
- Nano Coatings
- Mineral-filled polymers

Review and Quiz

What coating type(s) would you use for…

- Anti-corrosion on aluminum foil?
- Moisture barrier on paper?
- As an overprint varnish?
- Oxygen barrier on film?

www.tappiplace.org
PLACE
POLYMERS • LAMINATIONS • ADHESIVES • COATINGS • EXTRUSIONS

Thank You

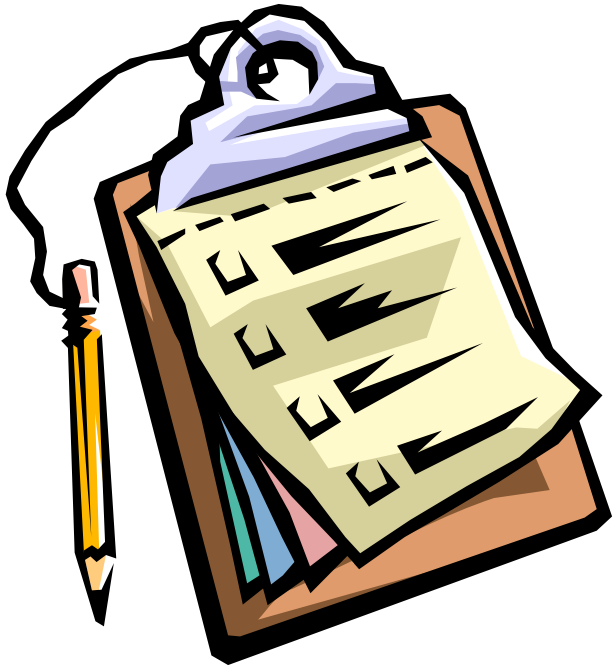
PRESENTED BY

Ginger Cushing

Business Development Manager

Michelman Inc

gingercushing@michem.com



Please remember to turn in your evaluation sheet...