Packaging Processes and Requirements

Pouch and Package Making

Presented by:
Roger L. Kaas
Kaas Consulting Group, LLC
Outline

• Pouch making processes
  – Vertical form fill seal
  – Horizontal form fill seal
  – Flow wrap
  – Flat bed pouchers
  – Thermoform fill seal
• For each type of machine discuss the following:
  – Pouch type
  – Film requirements
  – Typical applications
  – Barrier requirements
• Pouch features
Vertical Form Fill Seal (VFFS)

• Single web system
• Web is formed into a tube and a longitudinal seal is made
  – Fin seal or lap seal
  – Seal top and bottom of next package and drop fill
  – Longitudinal cut to make final package
  – Side gusseting
  – Intermittent or continuous action
• Dry food applications
  – Cereal
  – Snacks
• Liquid food
  – Food service
Intermittent VFFS
Continuous VFFS
Liquid VFFS
Requirements for VFFS

- Low seal activation temperature
- High hot tack
  - Product is dropped directly on hot seal
  - Heavy products can reopen bottom seal
- Stiffness
  - Registration control if printed
  - Cutting
- Low coefficient of friction (COF)
  - Film sliding over forming collar and fill tube
- Seal through liquid products
- Barrier requirements dependent on product
  - Moisture barrier for cereal and snacks
    - Maintain crispness and prevent staleness
  - Oxygen barrier
    - Prevent oil rancidity in snacks
    - Oxidation of hot fill products
  - Aroma/flavor barrier
    - Flavored cereal and snacks
Horizontal Form Fill Seal (HFFS)

- C-fold pouch
  - Single web
  - Fold web in center
  - May also have bottom gusset
    - Stand up pouches
  - Seal edges to form sides of pouch
  - Fill and seal top
  - Predominately dry products
    - Dry mixes
    - Pasta
  - In-line for low volume applications
  - Rotary for large volume
In-Line (HFFS)
Continuous Rotary (HFFS) Slow Motion
Continuous Rotary (HFFS) Full Speed

Pasta Pouch Machine
Requirements for HFFS

• Stiffness
  – Registration control for printed packages
  – Minimize stretching in machine

• Flex crack resistance
  – Folds and gussets

• Low seal activation for high speed machines

• Barrier requirement dependent on product
Horizontal Flow Wrap

- Form tube around product
- Longitudinal seal
- Cross seal and cut between packages
- Similar in concept to VFFS
- Applications
  - Toiletries
  - Medical devices
  - Industrial and commercial products
  - Candy and nutritional bars
Flat Bed Pouch Making

• Four side seal pouch
  – Two web system
  – Usually made on a flat bed pouch machine
  – Usually three side sealed premade pouches
  – Filled and final seal made in second operation
  – Typical application is for retort pouches
Stand Up Pouches

- Made with bottom gusset
  - One piece with plowed gusset
  - Separate bottom gusset
- Seal through holes punched in gusset to contain edges
- Stand up for shelf display
  - High quality graphics for customer appeal
  - Convenience
  - Contoured or shaped pouches
- Zipper insertion for reclosing
- Dispensing fitments
- Straw insertion for beverages
- Many applications
  - Beverages
  - Pet food
  - Retort pouches
  - Dry mixes and food products
  - Candy and confections
  - Household chemicals
Stand Up Pouch Bottom Gusset

Bottom Hole Punch
Thermoform Fill Seal

• In-line thermoforming and sealing
• Vacuum packaging
• Modified atmosphere packaging
  – Evacuate and recharge with inert gas
  – Nitrogen, carbon dioxide or mixtures
• Applications
  – Processed meat
  – Cheese
  – Medical devices
  – Industrial products
Thermoform Fill Seal Process

1. Lower web reel
2. The lower web is heated and formed into pockets in the forming die. The web indexes forward.
3. Package pockets
4. Filling
5. Upper web
6. The lower and upper webs are sealed to each other in a vacuum (or a modified atmosphere) in the sealing die by applying pressure and heat.
7. Cross cutting
8. Longitudinal cutting
9. Finished pack
Thermoform Fill Seal Requirements

• Forming film/bottom web
  – Thermoformability
    • Draw down into corners without excessive thinning
  – Abuse resistance
    • Puncture, abrasion and flex crack resistance
  – Clarity and gloss
  – Barrier dependent on application
  – Seal through contamination for food products

• Top web
  – Often printed with high quality graphics
  – Stiffness to maintain registration
  – Barrier dependent on application
  – Seal through contamination for food products
  – Peelability often incorporated in top web sealant
Pouch Features

• Easy open
  – Notches
  – Directional tear
  – Tear strip or string
  – Peelable seals
  – Straw insert
  – Laser score
    • Straight machine direction
    • Pattern or cross-machine
Laser Score
Pouch Features

• Easy open
  – Notches
  – Directional tear
  – Tear strip or string
  – Peelable seals
  – Straw insert
  – Laser score
    • Straight machine direction
    • Pattern or cross-machine

• Reclose
  – Tacky strip
  – Zipper, with or without slider

• Other features
  – Shaped or pattern cut pouch
  – Fitments
Shaped Pouch
Fitmented Pouch
Thank You

PRESENTED BY
Roger L. Kaas
Kaas Consulting Group
rlkaas@new.rr.com

Please remember to turn in your evaluation sheet...