“The Developments in Retort Pouches Applications”

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Clemson University

- Located in Clemson, South Carolina (USA)
- Founded in 1889 as Clemson Agricultural College
- Opened in 1893 with 446 students
  - Undergraduate Students: 19,669
  - Graduate Students: 5,282
- Avg SAT 1308
- 7 Colleges
- 80+ Undergraduate Majors
- 120+ Graduate Degree Programs
Retort Pouch History

• 1940’s
  – Concept of a flexible retortable material was developed.
• 1950’s
  – U.S. Army advanced the flexible retort pouch
  – Replace C-rations in combat rations in MRE’s.
• 1970-80’s
  – Some commercial effort in USA.
  – Asia & Europe growth.
• 1990’s
  – Pet Food
  – Starkist Tuna
• 2000’s
  – Multiple product categories.
Retort Pouch

• Advantages over metal cans
  – Weight
  – Volume
  – Processing time
  – Innovation
  – Convenience
  – Package graphics
  – Safety

• Challenges
  – Shelf Life
  – Protection of food product
  – Seal integrity
  – Filling speeds
Retort Pouch Requirements

• Title 21 CFR 177.1390
  • Resistance to penetration/migration
• Retort processing conditions
  • 240-275° (115.5-135°C)
  • 10-45 psig (0.7-3.1 bar)
• Product Protection - 1 year shelf life
  • <1 cc/m²/day - OTR
  • 0.05 g/100 in²/24 hrs. atm - WVTR
• Handling/Filling
  • Physical Strength
  • Abrasion
Market Growth

• 50% of retort packaging is retort pouches

• Continued strong growth.
  – Food/Beverage
    • Institutional
    • Geriatric
  – Baby food
  – Pet Food
  – Institutional
Retort Pouch Structure

• Original
  – Adhesive Lamination
  – PET/BON/Foil/CPP
  – PET/BON/CPP

• Non Foil Barrier Materials
  – SiOx
  – AlOx
  – Besela
  – EVOH
Retort Pouch Formats

• Preformed pouch
• Form-fill-seal
• Pillow pouch
  – 3 & 4 side seal
• Stand-up pouch
• Fitments
Retort Pouch Development

- Convenience
- Sustainability
- Graphics
- Shelf Life
Retort Pouch Fitments

• Convenience to consumer.
• Food waste reduction.
• New product options.
Self Venting Retort Pouch

Self-Venting Pouch

Self-venting Zipper Pouch

“Microwave Heating”  “Microwave Cooking”

Courtesy of Toppan USA
Sustainable Retort Pouch

- Amcor Flexibles
- AmLite
  - High-barrier OPP film
  - SiOx (silicon oxide) coating
  - 3 commercial grades of barriers
  - <1cc OTR
  - <1g WVTR
  - Provides single material recyclability.

Courtesy of Amcor Flexibles
Retort Pouch Processing

- Shaka
- ACB Hydrolock
Retort Pouch Graphics

- Flexo-Printing
  – Solvent based
- Just-in-time Printing
  – Digital Printing Technology

Courtesy of Toyo Ink America & Epac Flexible Packaging
Retort Pouch Barrier Film Technology

• Continued improvement.
• New substrates.
• New coating technologies.
Summary

• Continued steady growth.

• Drivers:
  – Sustainability
  – Non-foil barrier technology
  – Innovative food products
  – Convenience
  – Food service
  – Processing Technology
Thank you!

• Questions?
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