

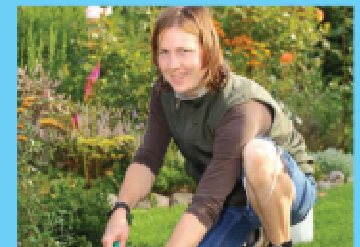
# Advancement in Shelf Stable Food & Beverage Packaging

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Market Development Manager

**Printpack Packaging Supplies (India) Pvt Ltd**

*May 18, 2015*



**Printpack**

# Printpack Today

Vertically integrated flexible and rigid packaging manufacturer

**1956** 60 Years of Packaging Experience

**\$1.4+** Billion in Sales

**4,000** Associates

**+22** Manufacturing Plants Worldwide

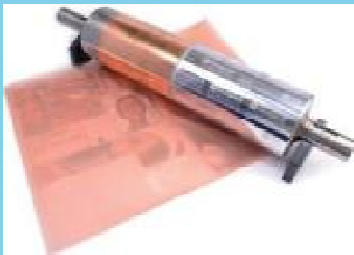


# Locations



# Capabilities

- Blown Films and **Cast Sheet** & Films
- Extrusion and Adhesive Lamination
- Digital Prepress Workflow
- Flexographic and Rotogravure Printing
- Metalizing and Coating
- **Thermoforming**
- Shrink Labels & Bands, Multipack Shrink Sleeves
- Die-Cut Lidding
- Registered Cold Seal
- Laser Micro-Perforation and Scoring
- Pouch and Specialty Bag Making
- Fitment Insertion
- Pre-Applied Pressure Sensitive Labels and Valves
- Reseal-It® System



Prepress Services



Rigid Packaging and Lidding



Flexible Packaging

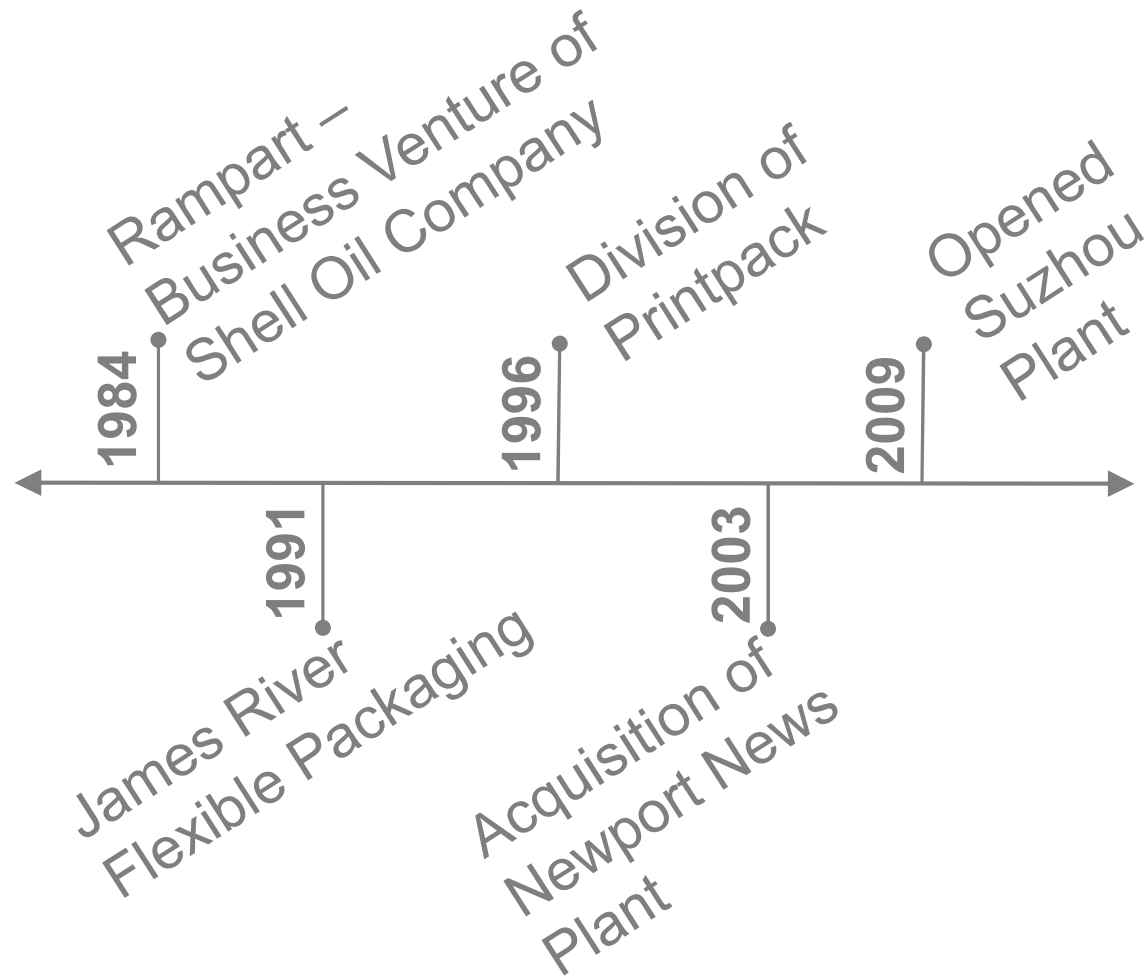


Labels



Medical

# Rigid Plastics Division



## 3 Manufacturing Sites

Williamsburg, Virginia · Newport News, Virginia · Suzhou, China



# Trusted By the Most Trusted Brands



# The Innovation Hub





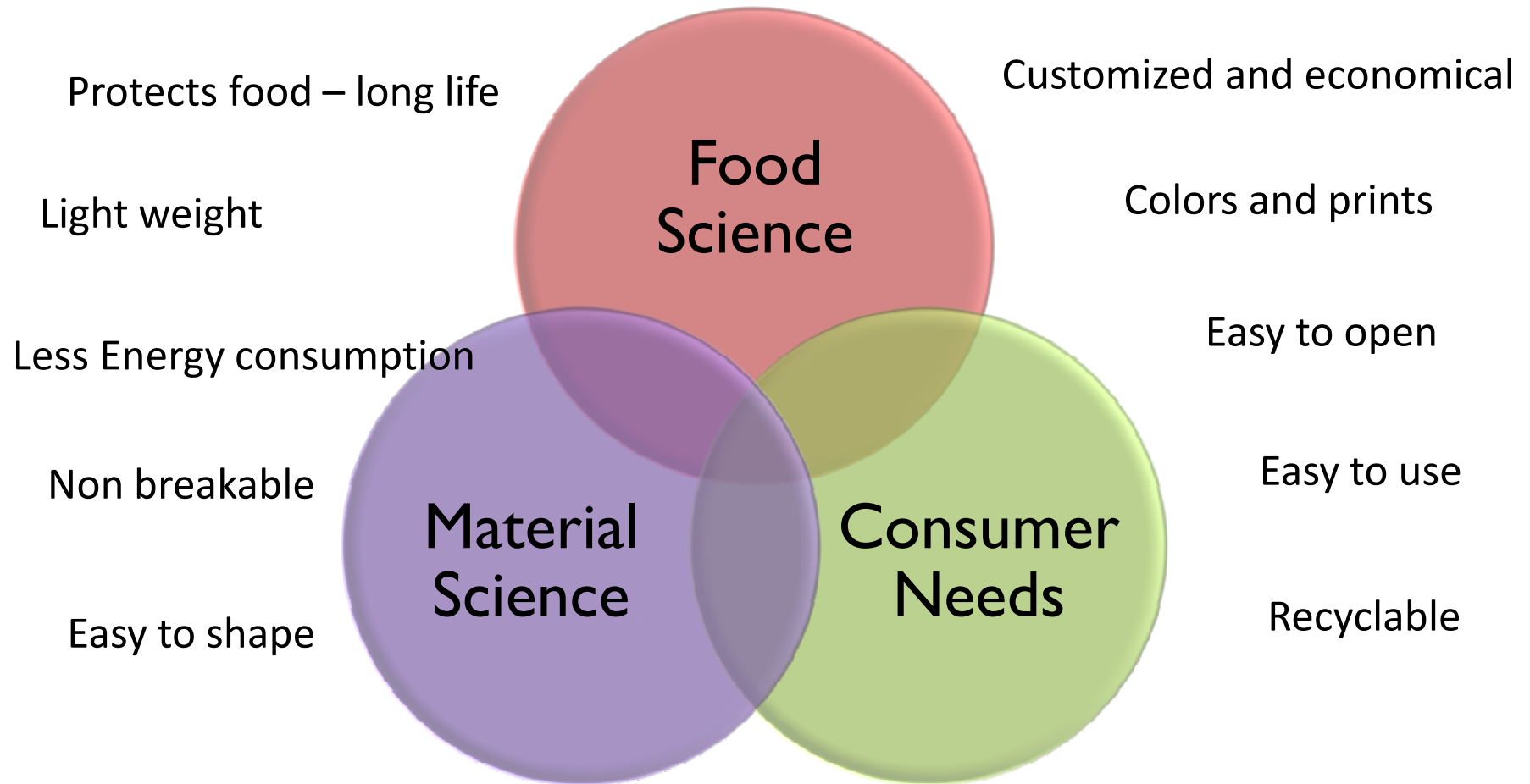
# What we do?

*Replace traditional packages with advanced packaging that extends shelf life, and improves sustainability*



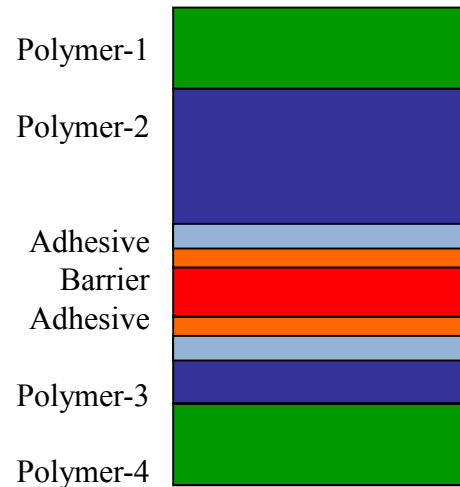


# Barrier Containers Value Proposition



# How we do it?

## Technology of High Barrier Sheet & Thermoforming



- Variety of polymers
- Capable of 11+ layers
- Various structure arrangements
- General thickness: 0.75 to 2.30 mm
- High precision Thermoforming
- Flat, coined seal surface
- Best for retort, hermetic heat seal

# Shelf Stable Food = Packaging + Sterilization

## Traditional Thermal

Hot fill - Pasteurization  
Retort

*In Package Cooking with Aseptic*

## Aseptic

Hydrogen Peroxide  
Steam

## Packaging

## Advanced Thermal

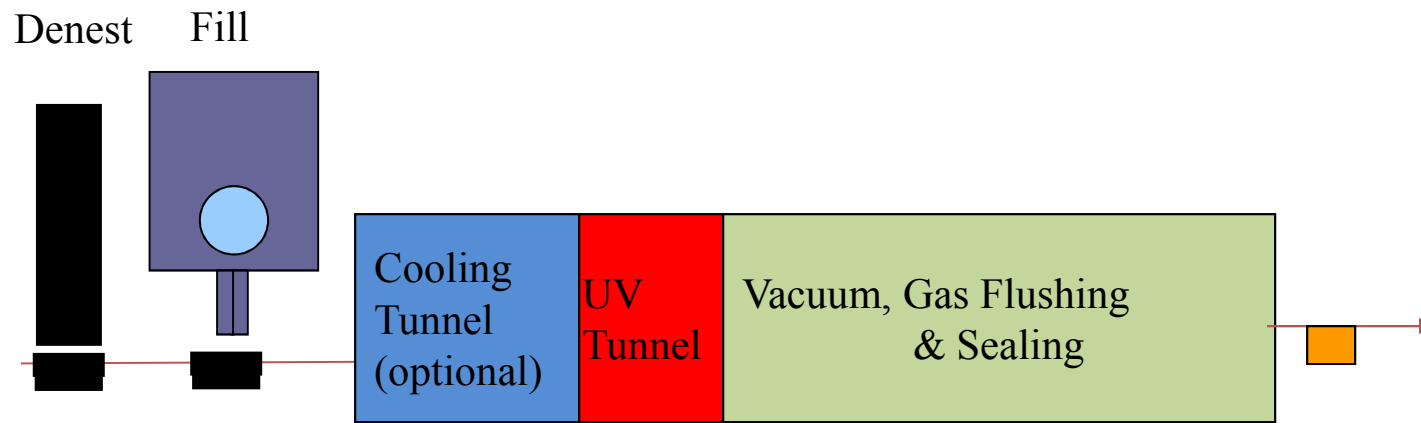
Microwave Assisted Thermal  
Sterilization  
Ohmic Heating

*Temperature Assisted Pressure*

## Advanced Non-thermal

Modified Atmosphere  
Packaging  
High Pressure Pasteurization

# Modified Atmosphere Packaging



## Product

Low water activity dairy and non dairy sweets, nutrition powders, instant mix, snacks & savory products, Dry fruits & nuts, Ready meals,

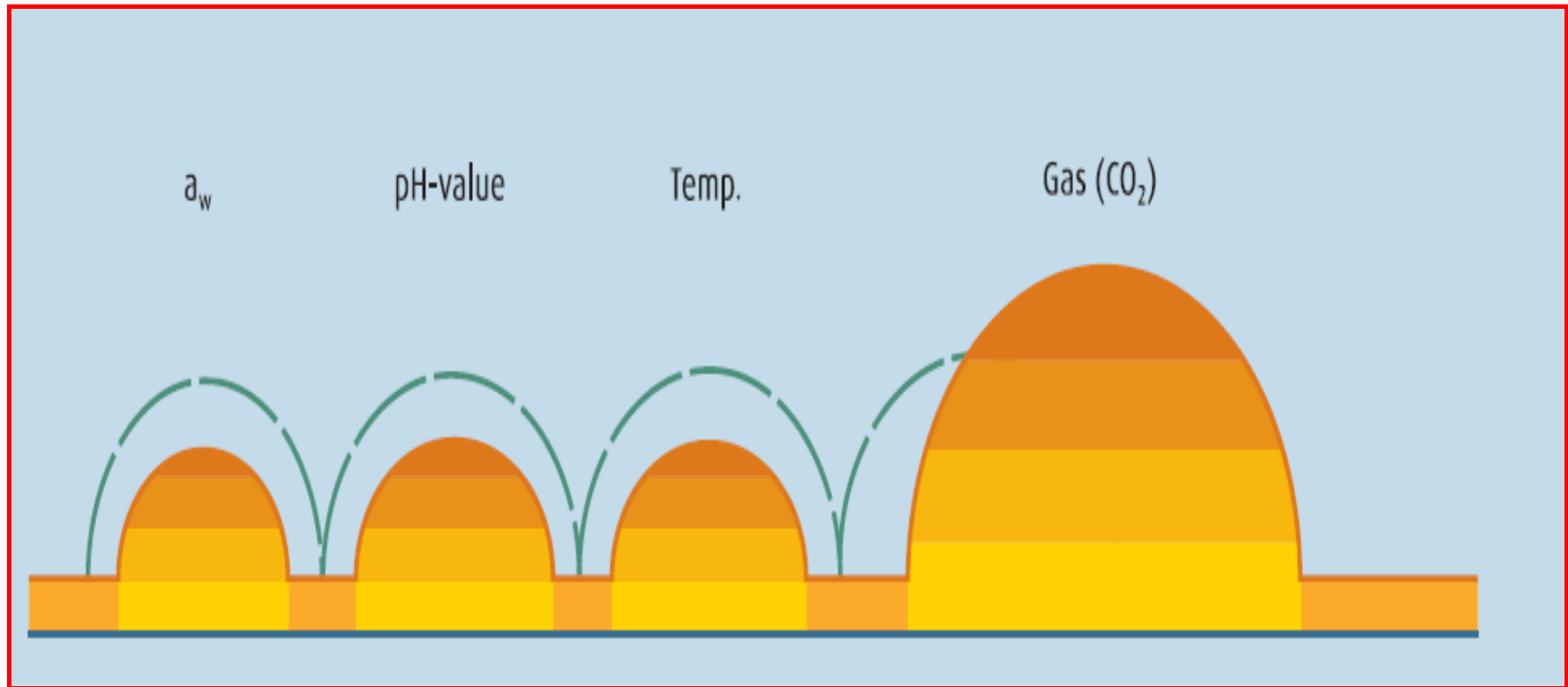
## Process

Product is filled, package is exposed to UV and then MAP sealed

## Package

Barrier trays & lids suitable to withstand UV and MAP gases are used

# Hurdle Technology

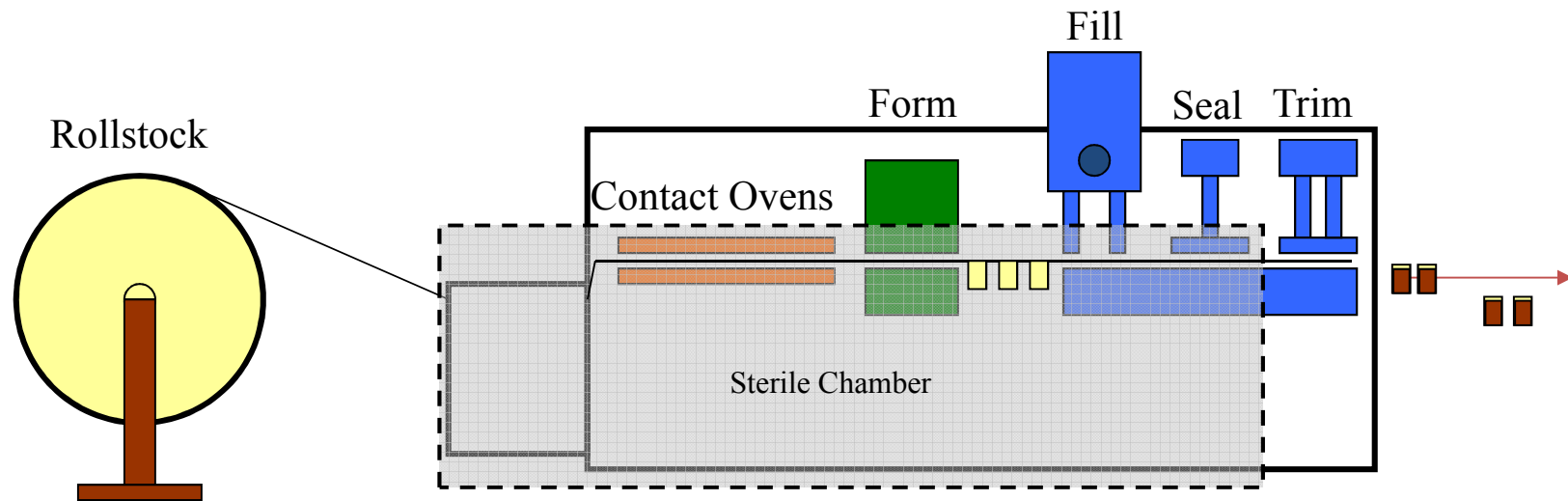


It is essential that other hurdle technologies be utilized in conjunction with MAP

# MAP: Modified Atmosphere Packaging



# Aseptic Form Fill Seal



## Product

low-acid dairy,  
puddings, gelatins, and  
fruit, vegetable & meat  
purees

## Process

Machine surfaces are sterilized using H2O2  
Product is heat sterilized then cooled for fill  
Package is sterilized by steam or H2O2

## Package

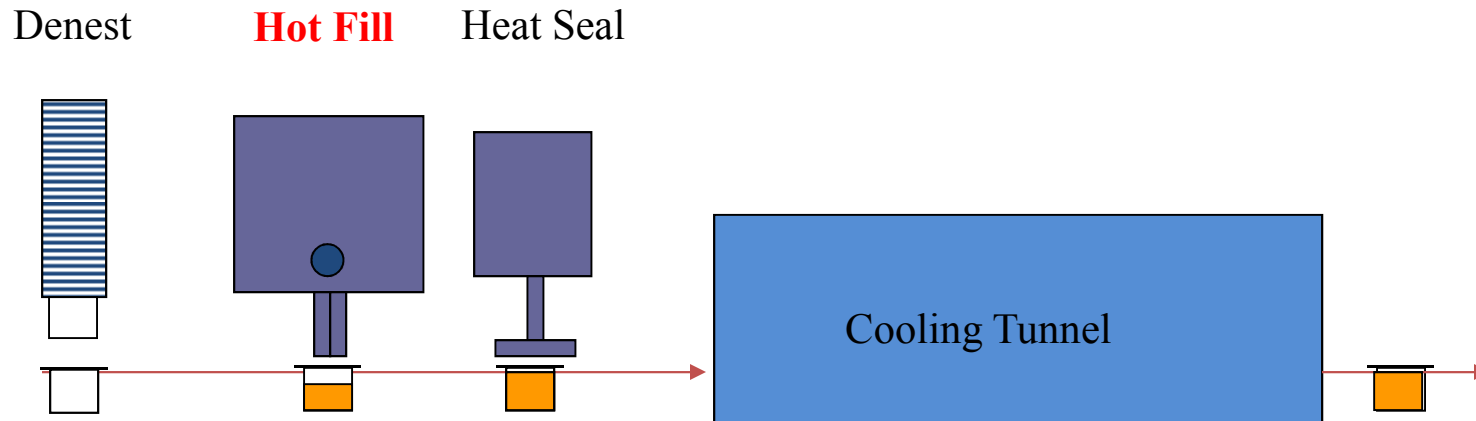
High barrier sheet is used as bottom web  
High barrier lid film is used as top web



# Products from Aseptic Form Fill Seal



# Hot Fill Sterilization



## Product

High acid foods:  $\text{pH} < 4.0$  without particulates: fruits pulps, purees & juices, salsa dips, & acidified cheese dips

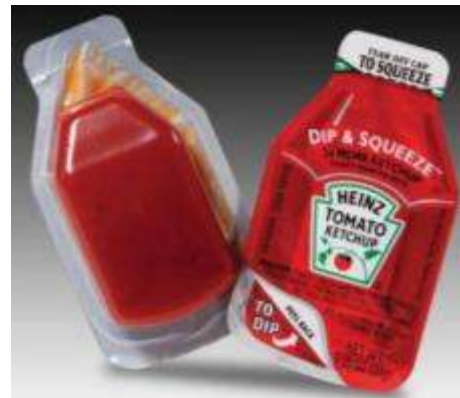
## Process

Sterilization is achieved by hot product fill (~84 to 90 C)

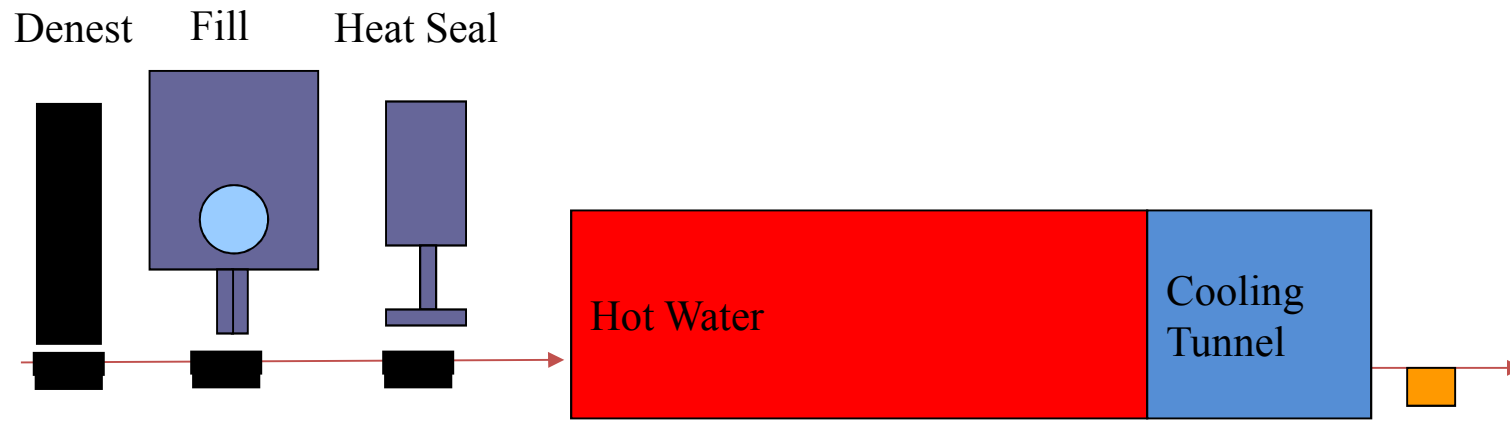
## Package

High barrier cups & lids suitable to withstand filling temperature and vacuum panel are used

# Products from Hot Fill Sterilization



# Hot Water Sterilization Process



## Product

High acid food with and without particulates  
(Ph < 4.0)  
Diced fruits, acidified vegetables

## Process

Product is filled, package is sealed and then sterilized in hot water bath at 85C to 90C

## Package

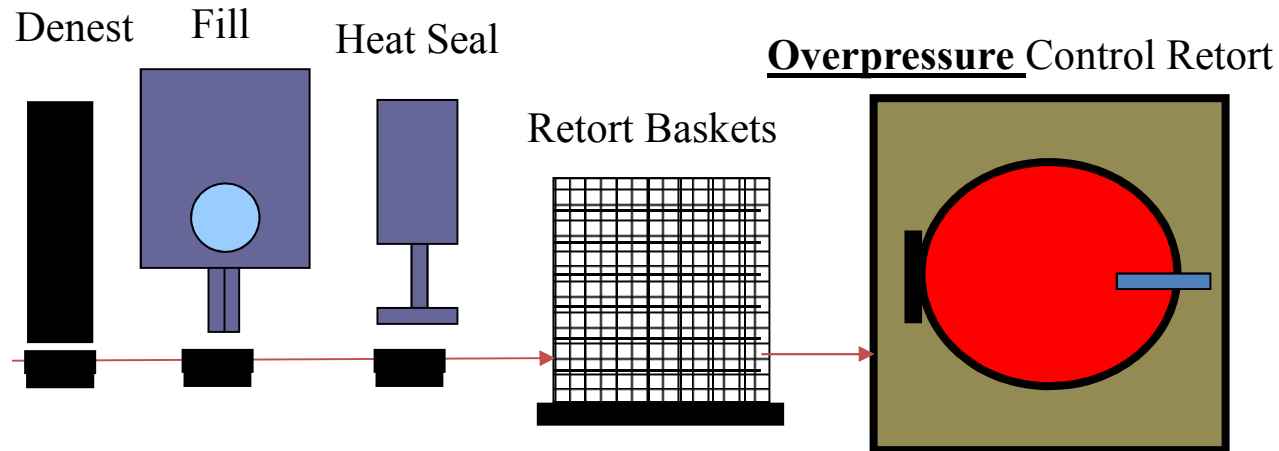
High barrier cups & lids suitable to withstand retort are used



# Products from Hot Water Sterilization Process



# Retort Sterilization Process



## Product

Low acid foods (PH > 4.6)  
Meats, vegetables, RTE  
meals, soups & dairy

## Process

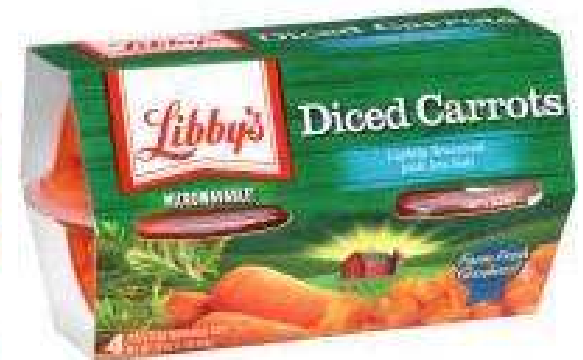
Product is filled, package is sealed and  
then sterilized by retorting process

## Package

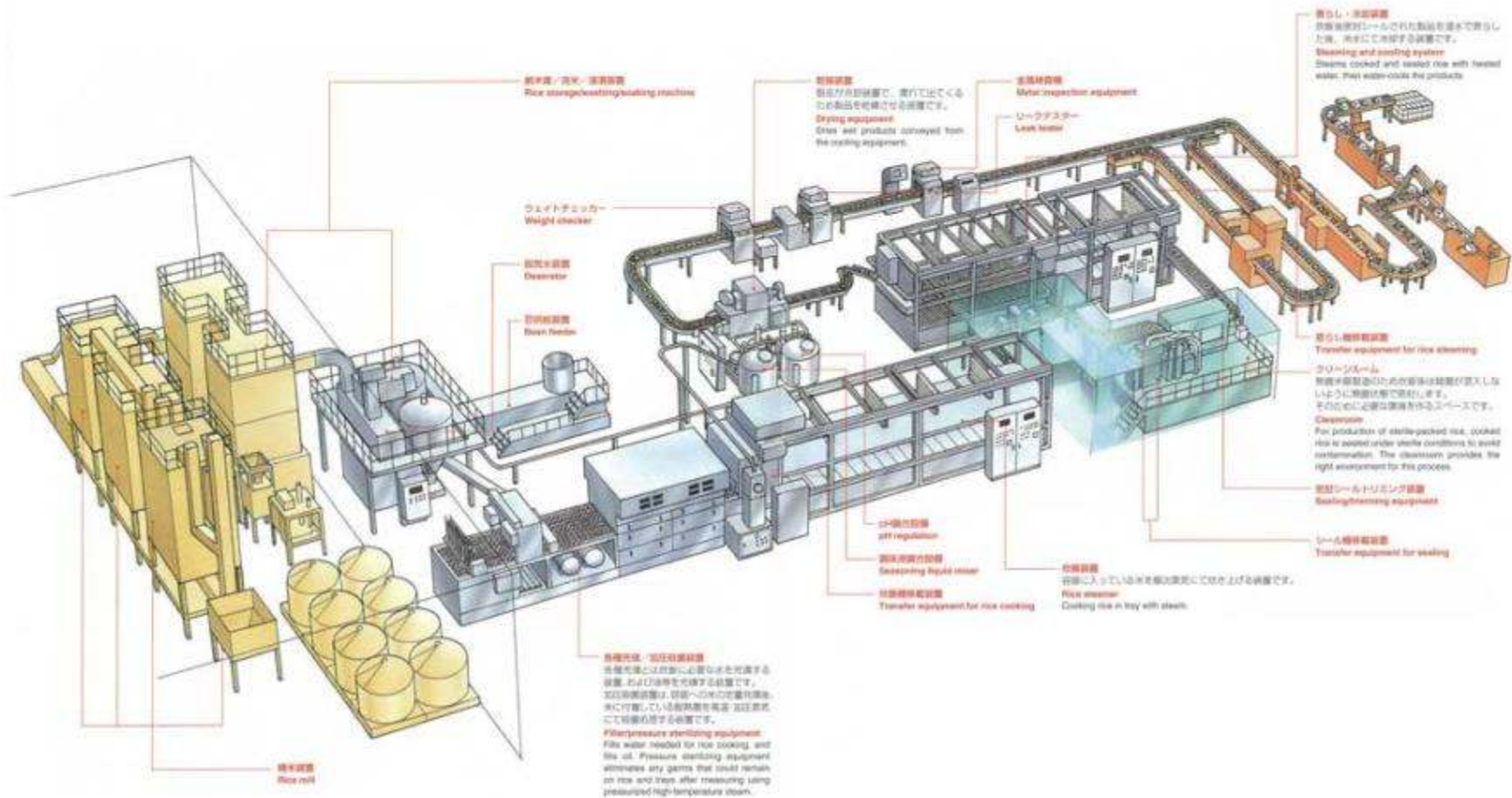
High barrier cups & lids suitable to withstand  
retort are used

*Air overpressure control is critical to maintaining plastic package integrity. Ideally control vessel pressure to within 0, +3 psi of container pressure*

# Products from Retort Sterilization Process





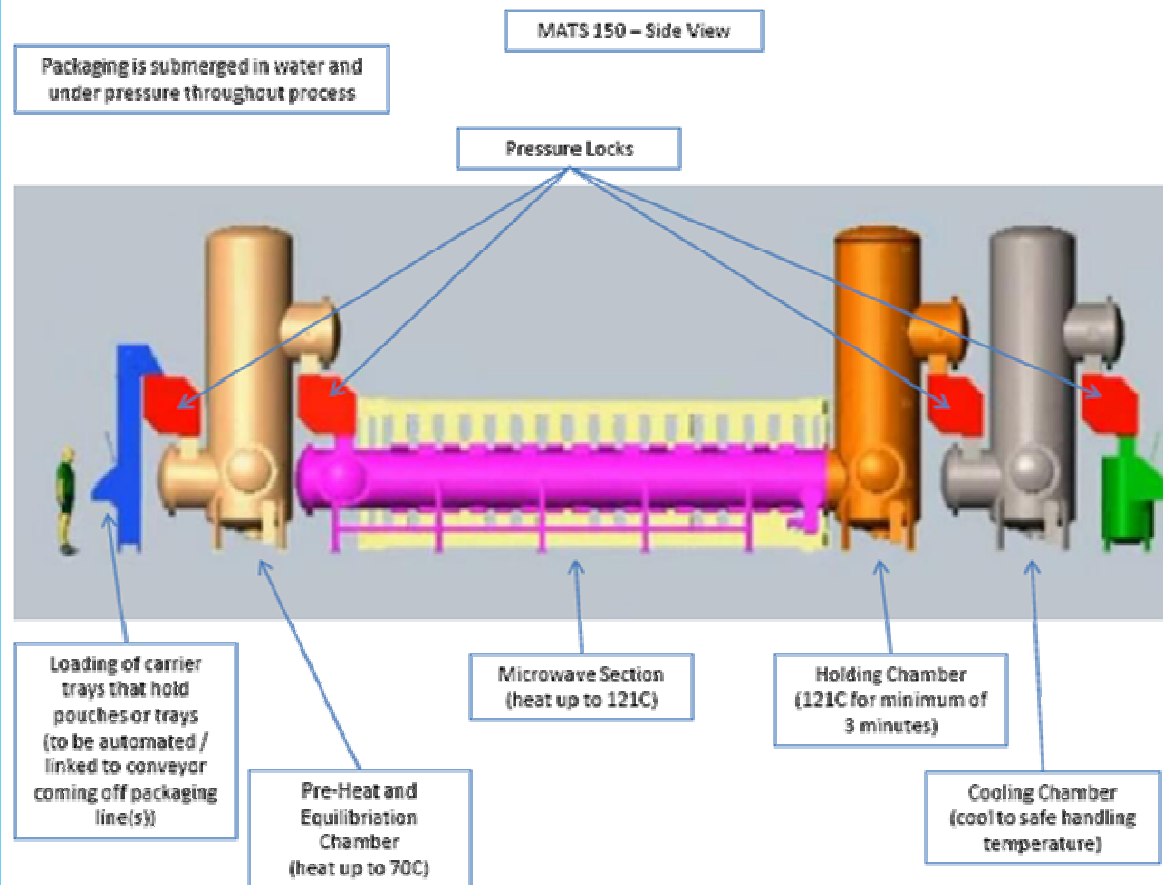


# Steam Cooking – what else?

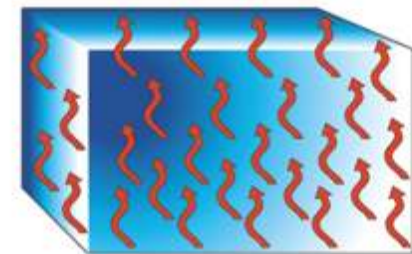
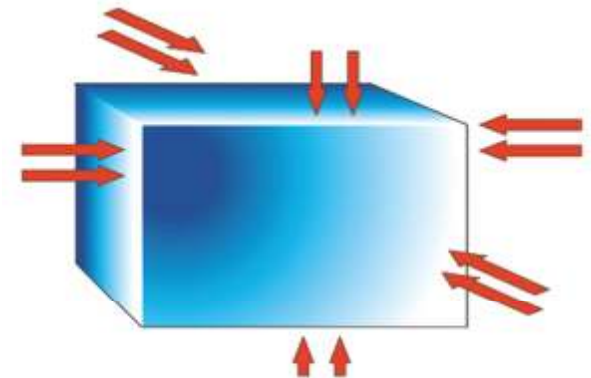


# MATS: Mw Assisted Thermal Sterilization

## Faster and Uniform Heating Pattern



### Conductive Heating



### Mw Volumetric Heating

# How is MATS different?

- Packaged food is simultaneously heated externally by pressurized hot water, and internally by patented microwave system
- Food rapidly reaches sterilization temperature, significantly reducing process times and heat damage
- Provides vastly better quality and higher nutritional value
- First microwave sterilization technique approved by the US FDA
- Three pilot machines operational in US – access available
- First continuous (150packs/min) commercial machine coming online in Q1 2016



**Consumer Packaged Foods. Transformed.**



# Heating Differentials of MATS vs Retort

Heating Hold Time to Achieve Same Target Fo		
PRODUCT	MATS TIME (min)	CONVENTIONAL RETORTING TIME (min)
300g Mashed potato	10.1	28.8
250g <i>Salmon &amp; Alfredo</i>	6.8	24.0
250g <i>Chicken dumpling &amp; Sauce</i>	6.5	21.0
250g Cheese Tortellini	7.3	46.5

# Impressive results!



**Conventional Retorted  
Chicken and Dumplings**



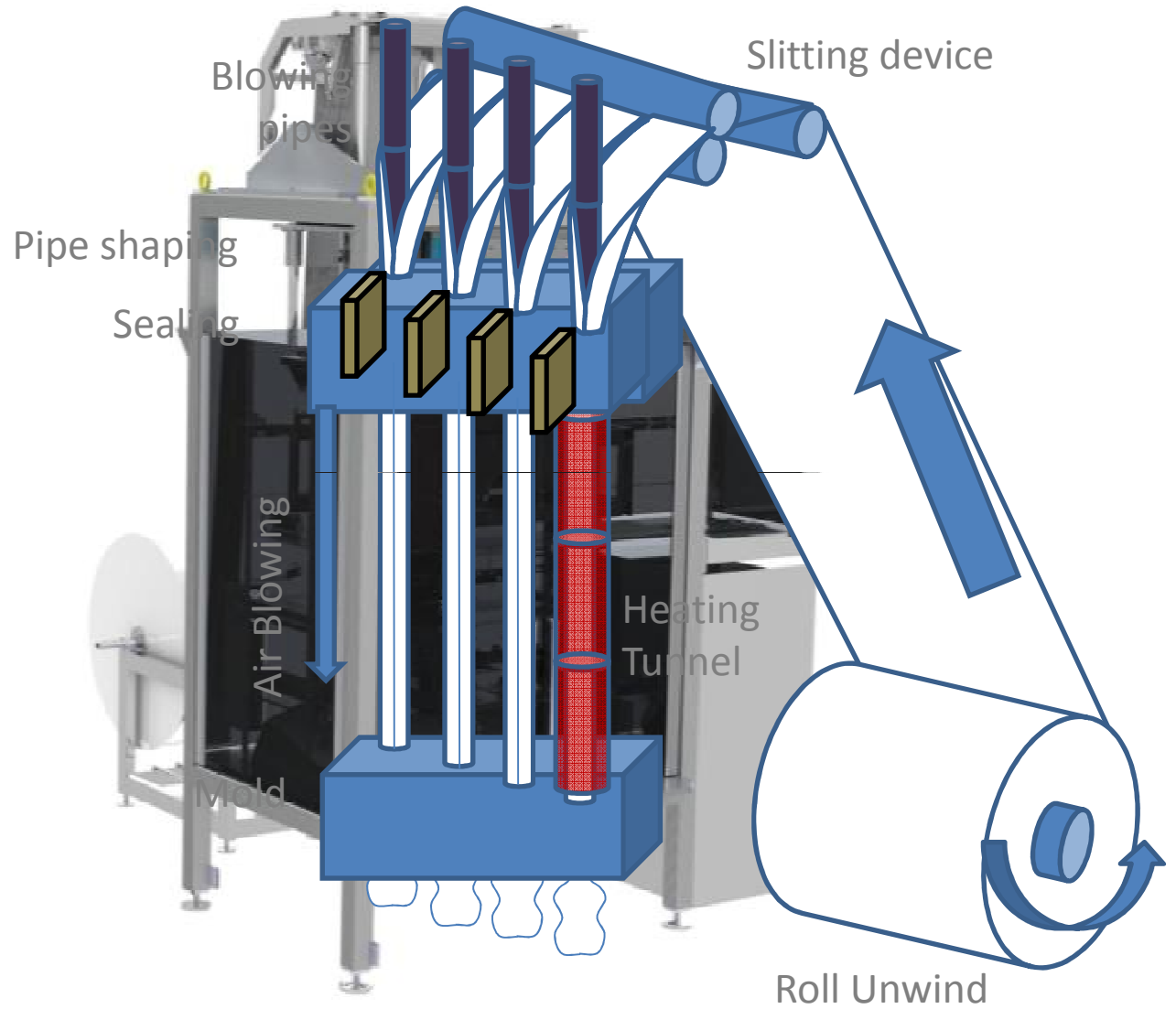
**Microwave Sterilized  
Chicken and Dumplings**

# Cheese Tortellini





# Serac - Roll n Blow



# RnB Agami

## Economic Advantages

- Wide multilayer plastic sheet
- Uniform distribution of the plastic material
- Low investment cost
- Costs savings in transport, storage and handling



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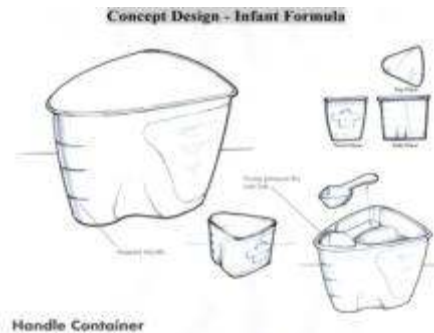
# Agami Bottle Technology Differentiation

- Technology can be alternative to
  - Glass & Can
    - Expensive system cost
    - Food safety
  - EBM
    - Limitation on thickness down gauge, shipping cost
    - Barrier is very expensive
  - Tetra-Pak
    - Differentiation of shape, size & clarity, cost for with closure systems
  - Hot fill PET
    - Differentiation of shapes, higher barrier, system cost
  - Tube
    - One step conversion process vs three to four steps
    - Differentiation of shapes, higher barrier, System cost

# From Idea to the Shelf

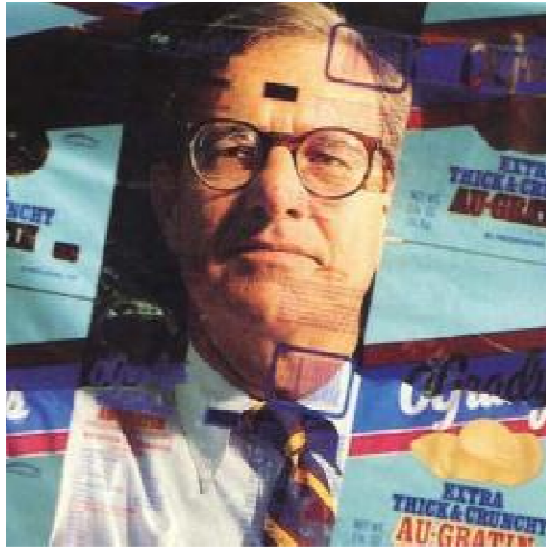


- Partnerships with conceptual design houses
- Brainstorming with customers
- Prototype samples made for initial review
- Full testing capabilities
- Expertise and experience developing customized package solutions



Questions?





*"Be willing to encourage and accept change, to experiment, to explore the unknown, to take risks, and above all, seek excellence in everything you do."*

*– J. Erskine Love, Jr.*

Thank you!