

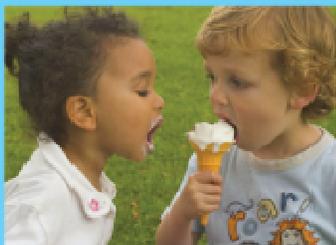
Advancement in Shelf Stable Food & Beverage Packaging

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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



- ★ Headquarters
- Manufacturing Facility
- Sales Office

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

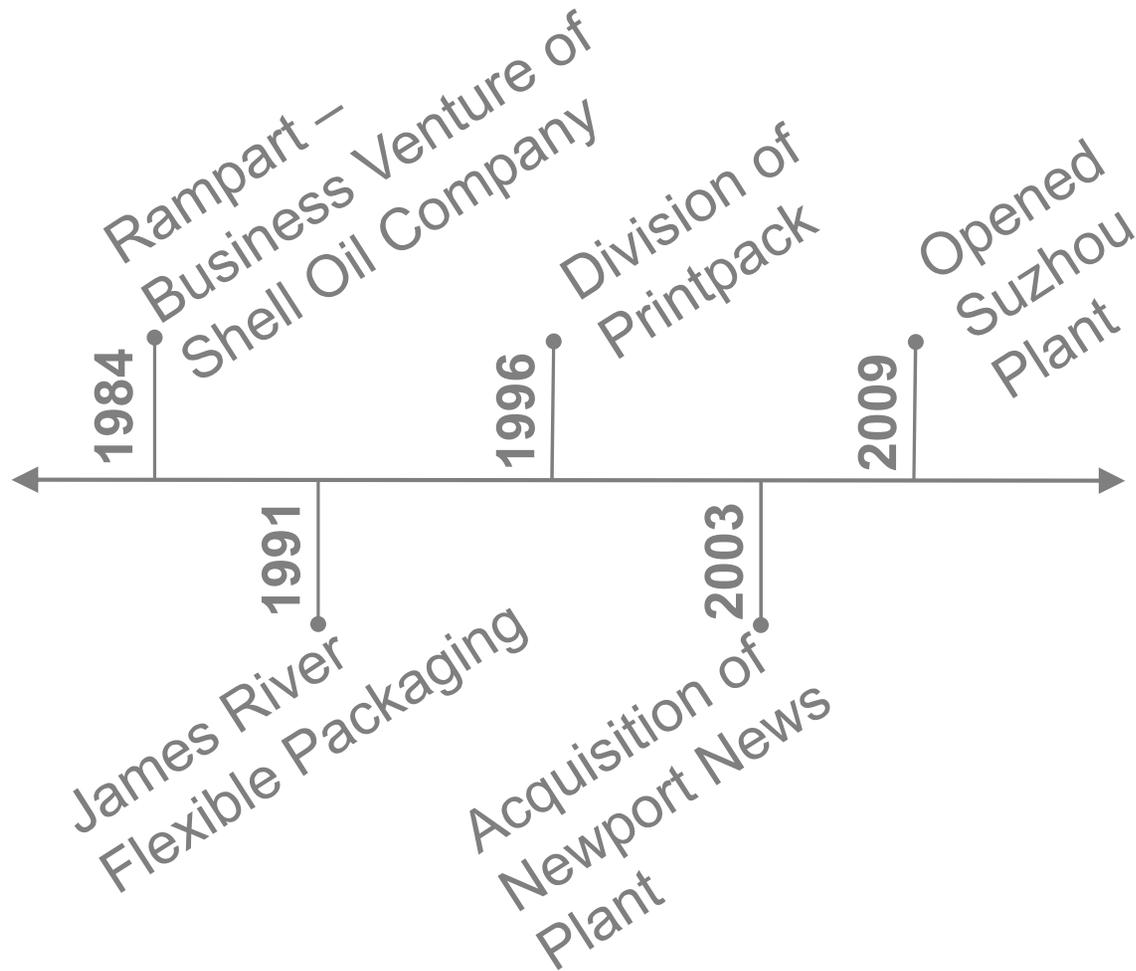


Labels



Medical

Rigid Plastics Division

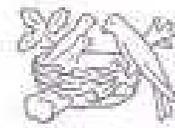


3 Manufacturing Sites

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



Trusted By the Most Trusted Brands



The Innovation Hub

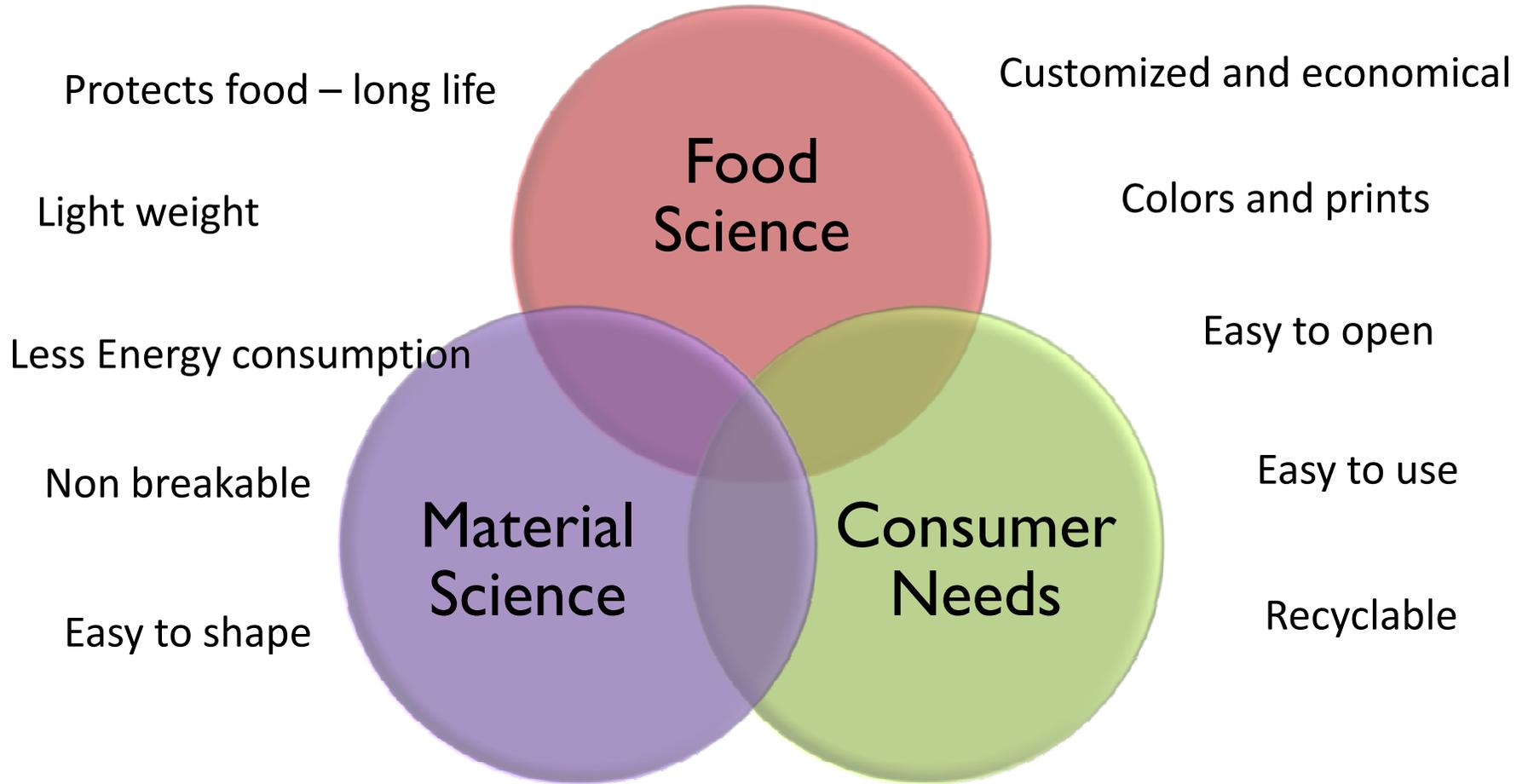


What we do?

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

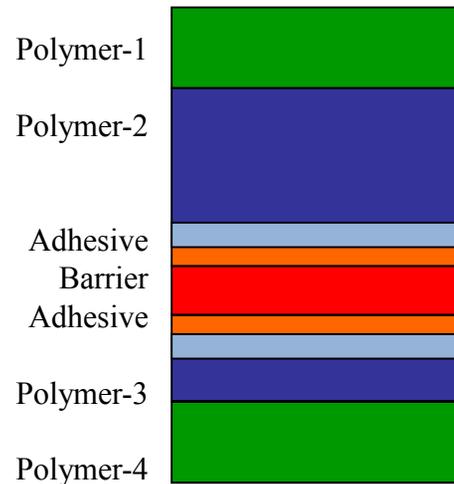


Barrier Containers Value Proposition



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

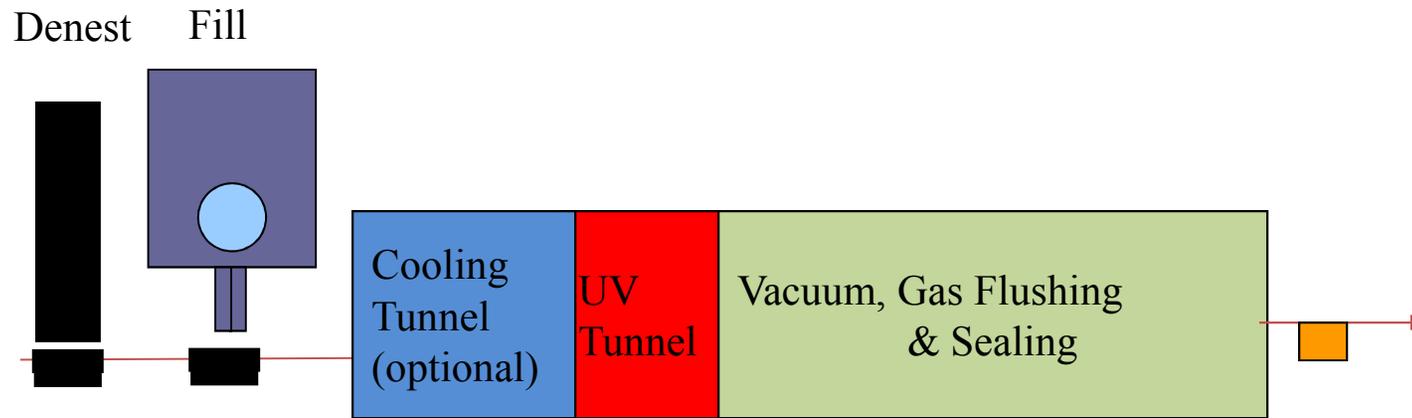
Microwave Assisted Thermal
Sterilization
Ohmic Heating

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,

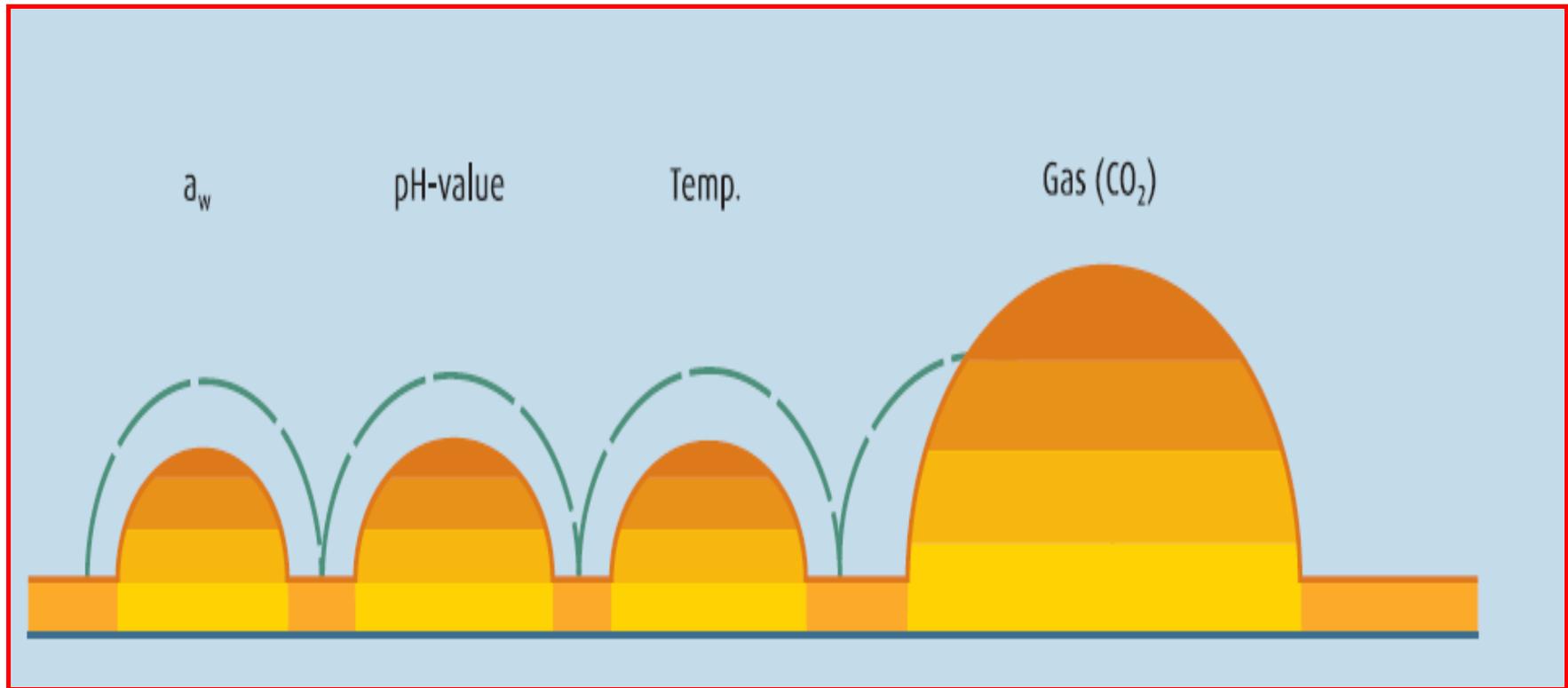
Process

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

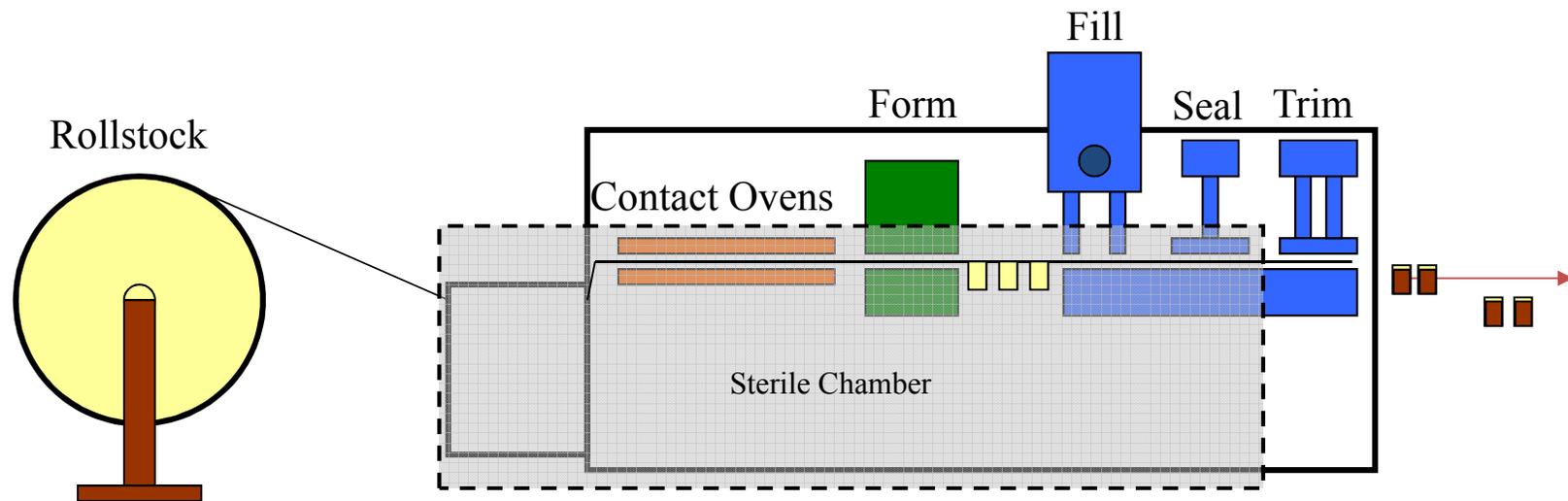


It is essential that other hurdle technologies be utilized in conjunction with MAP

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

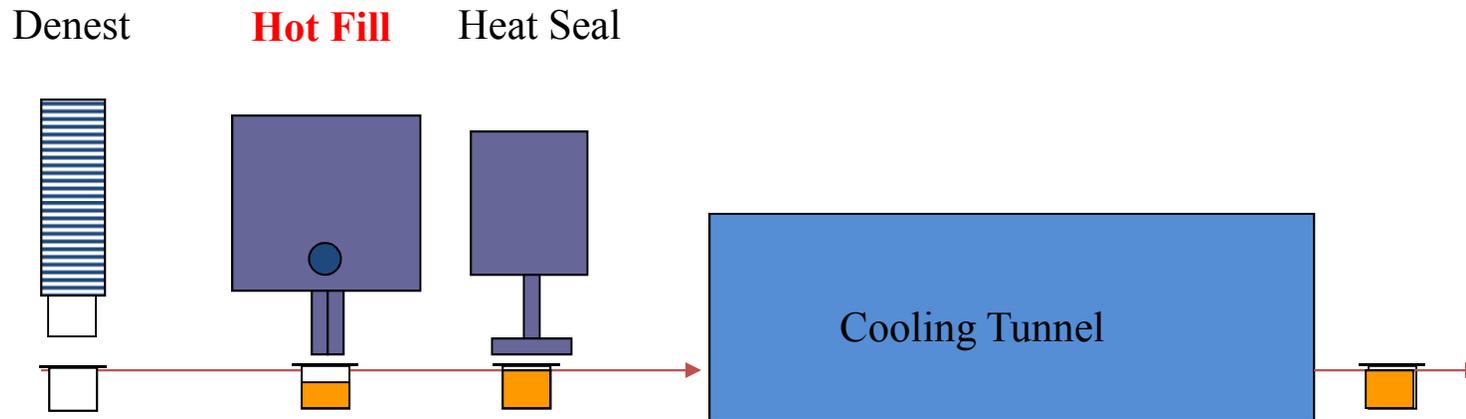
Package

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)

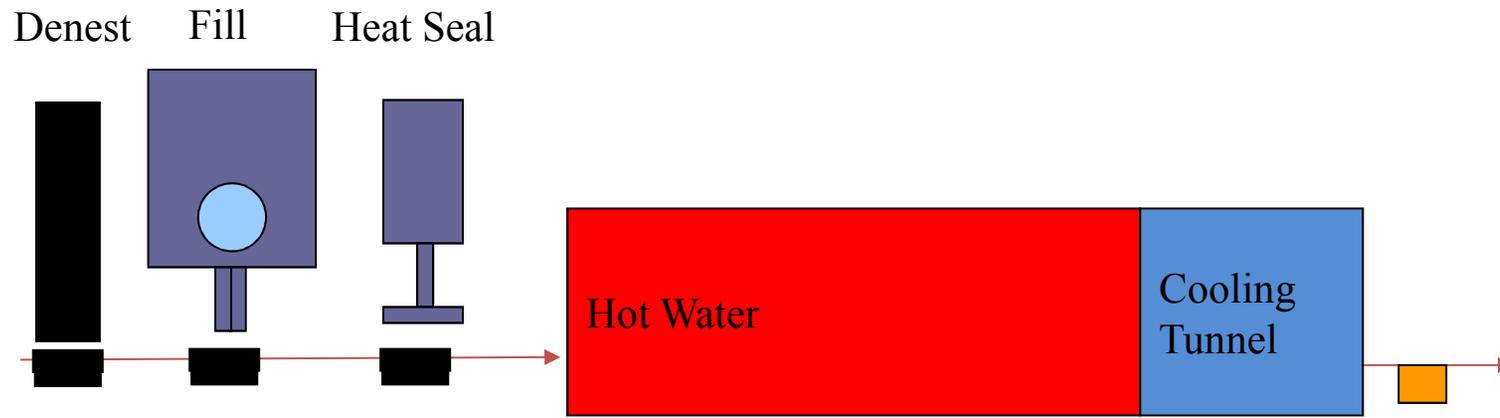
Package

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

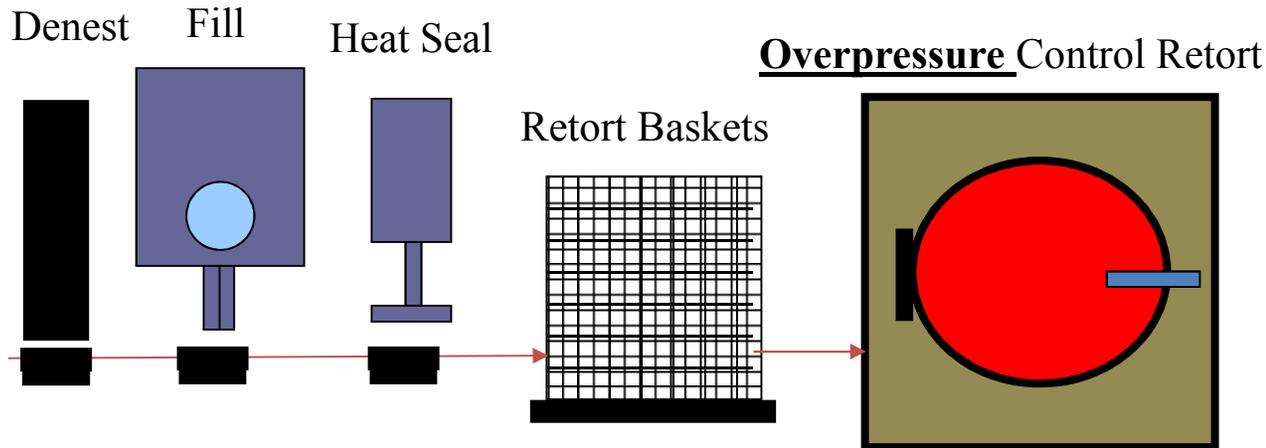
Package

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

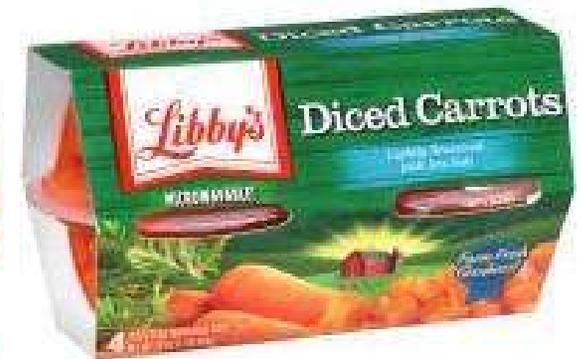
Product is filled, package is sealed and
then sterilized by retorting process

Package

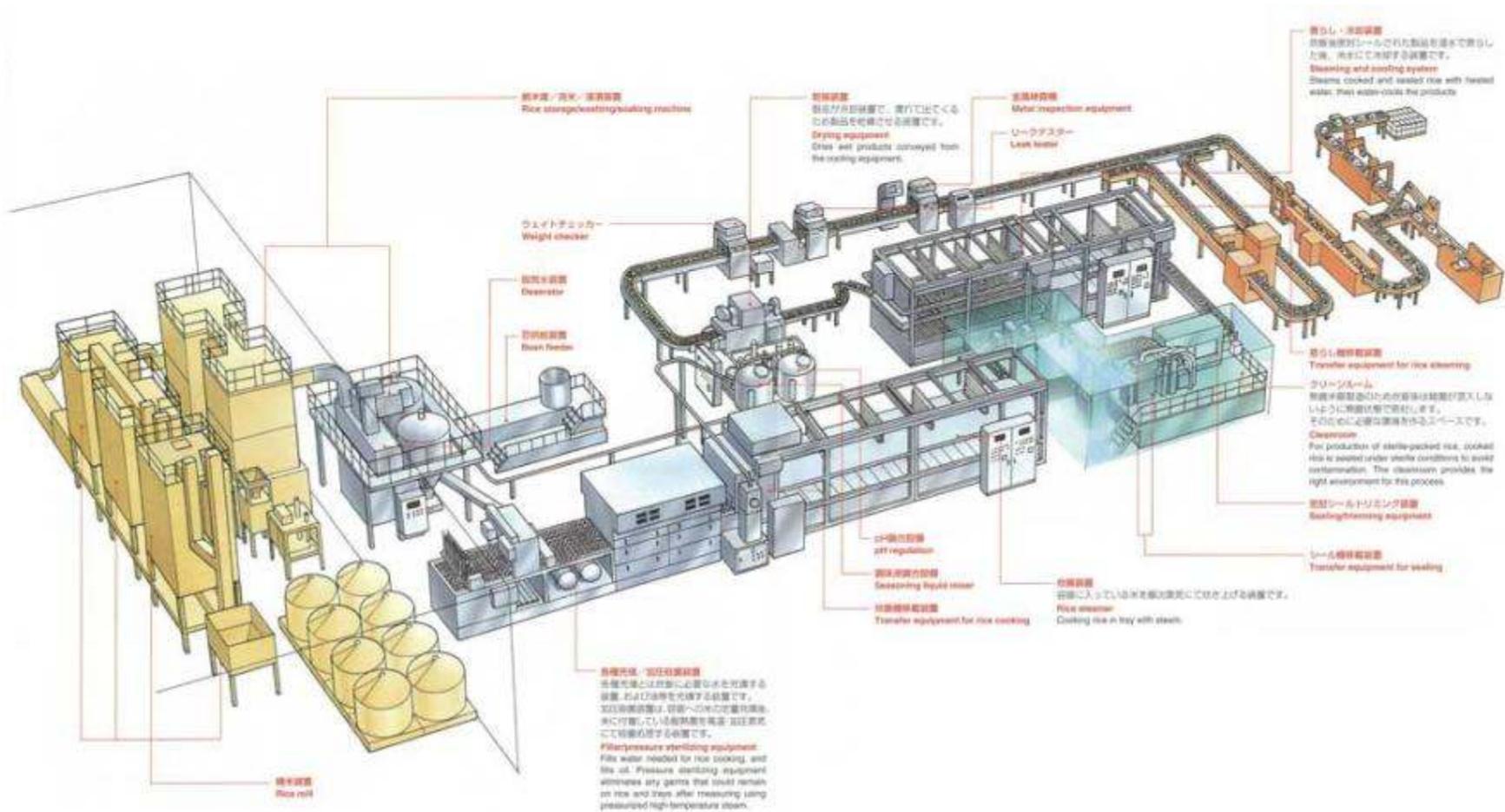
High barrier cups & lids suitable to withstand
retort are used

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



In Package Aseptic Cooking Technology



Steam Cooking – what else?



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 & Alfredo</i>	6.8	24.0
250g <i>Chicken dumpling & Sauce</i>	6.5	21.0
250g Cheese Tortellini	7.3	46.5

Impressive results!



**Conventional Retorted
Chicken and Dumplings**

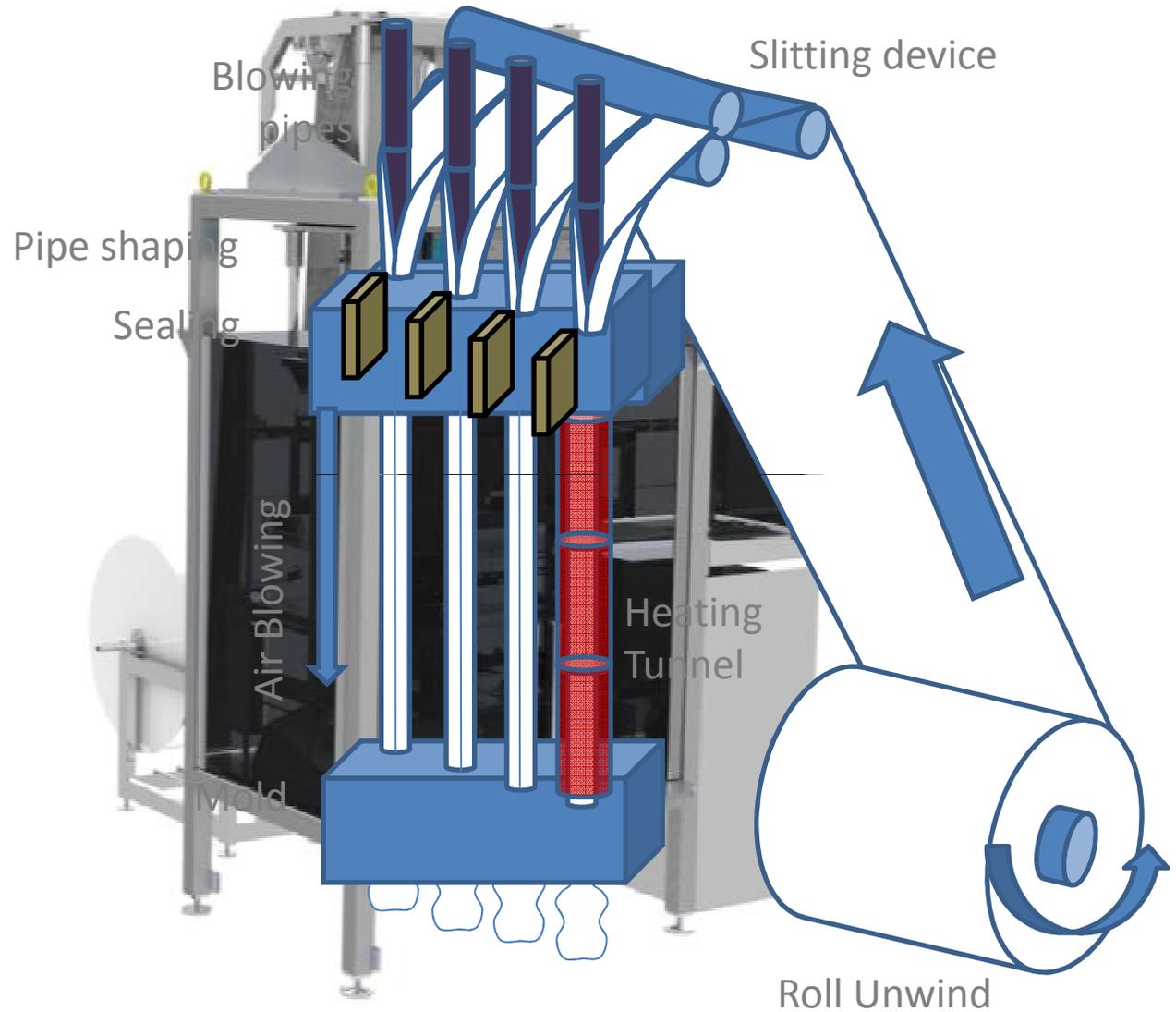


**Microwave Sterilized
Chicken and Dumplings**

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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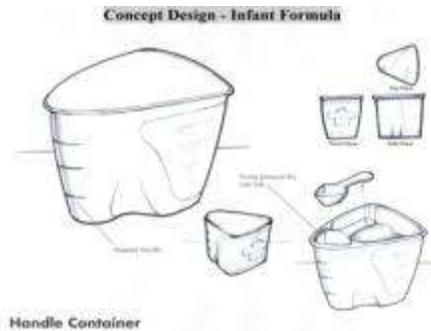
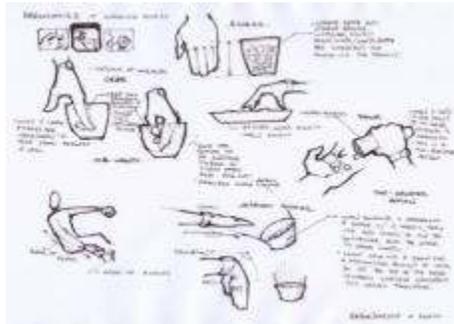
Agami Bottle Technology Differentiation

- 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

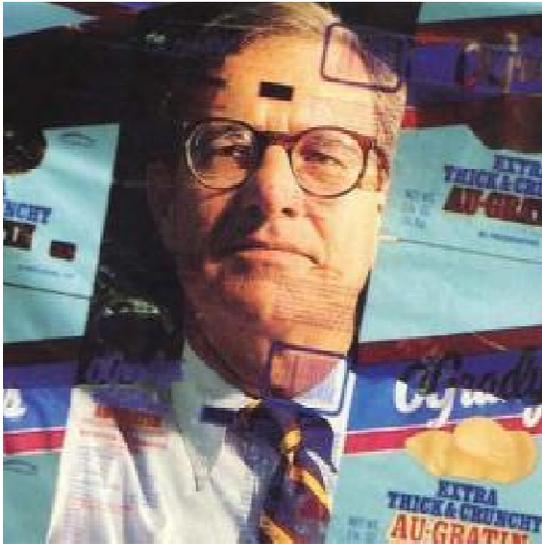


- Partnerships with conceptual design houses
- Brainstorming with customers
- Prototype samples made for initial review
- Full testing capabilities
- Expertise and experience developing customized package solutions



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!