
CSP TECHNOLOGIES SM
Your product, actively protected

# COMBATING MOISTURE INGRESS & STREAMLINING PACKAGING PROCESSES WITH NEXT-GENERATION ACTIVE PACKAGING SOLUTIONS

# Overview

- Introduction to CSP Technologies
- Oral Solid Dose/ Bottle Needs & Challenges
- Existing Options
- Engineered Polymeric Solutions

# CSP TECHNOLOGIES

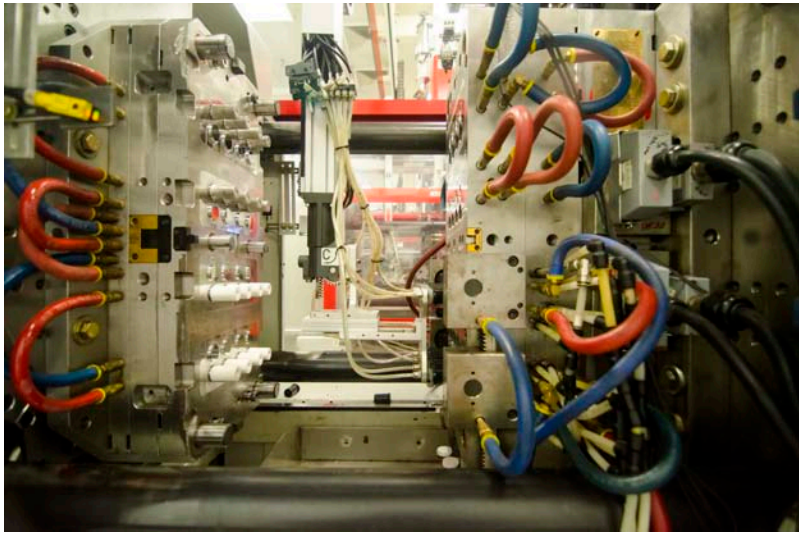
- HQ: Auburn, AL
  - Sales office in US, EU, Asia
  - Over 1 billion+ molded products shipped annually
- Development sites in North America & Europe
  - Innovation Technical Center in Paris
- Production sites in Auburn & Niederbronn
  - Six Sigma, ISO 9001 certified, cGMP

ISO 9001:2008

cGMP Current Good Manufacturing Practice CONSISTENT QUALITY

# CORE CAPABILITIES

- Material Science
- Complex/Precision Molding
- Design, Development & Production

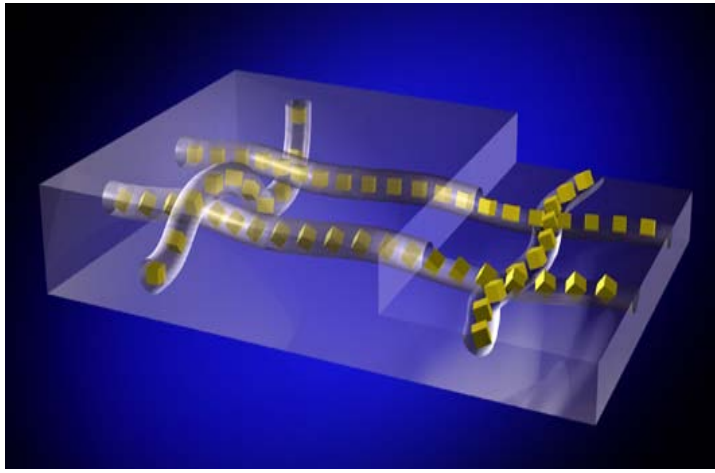


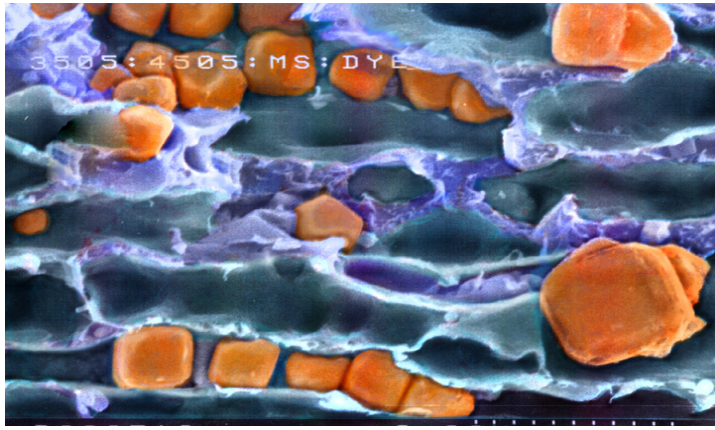
# CORE CAPABILITIES

## MATERIAL SCIENCE: ADDING CHEMISTRY TO POLYMERS

### Three-Phase Polymers

1. Channels created within a polymer allow movement of gases
2. “Active” particles are added to the polymer in order to:
    - Adsorb or Absorb (moisture, gases, reactive impurities, odors)
    - Release (aromas, biocides, nutrients, carbon dioxide)
3. Gas diffusion controlled through the channel composition



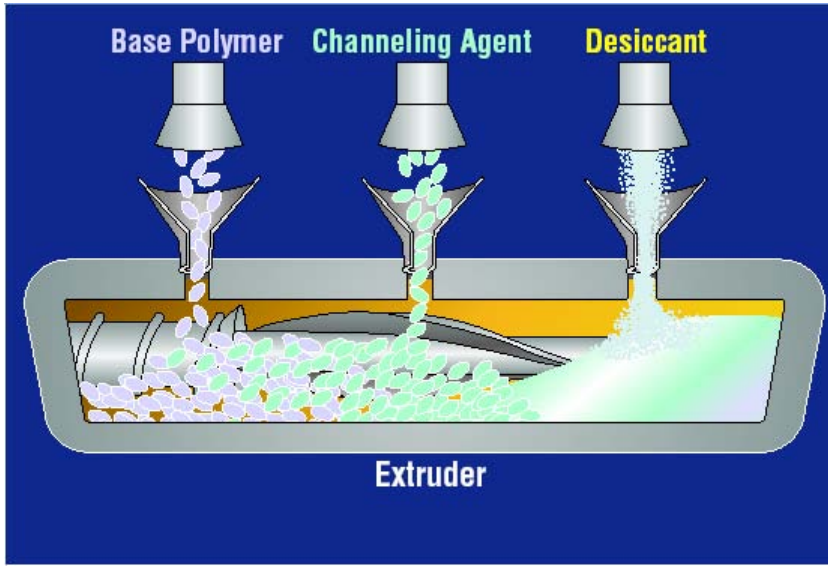


# CORE CAPABILITIES

## MATERIAL SCIENCE: ADDING CHEMISTRY TO POLYMERS

### Three-Phase Polymers

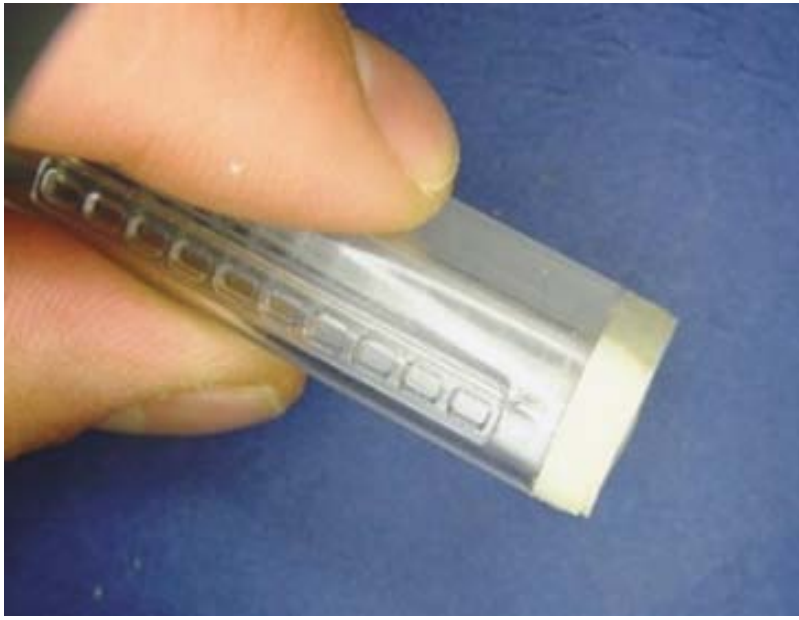
1. Majority Polymer: Base structure component
2. Particle: Adsorbing/absorbing – agent/active component
3. Minority Polymer/channeling agent: Immiscible in majority polymer
4. Can be extruded, injection molded and blow molded



# CORE CAPABILITIES

## COMPLEX/PRECISION MOLDING

- Two & three-shot molding with polymers and elastomers
- In-mold labeling with superior graphics or the addition of functional barriers ( e.g. Al-foil)
- Molding medical devices/device components

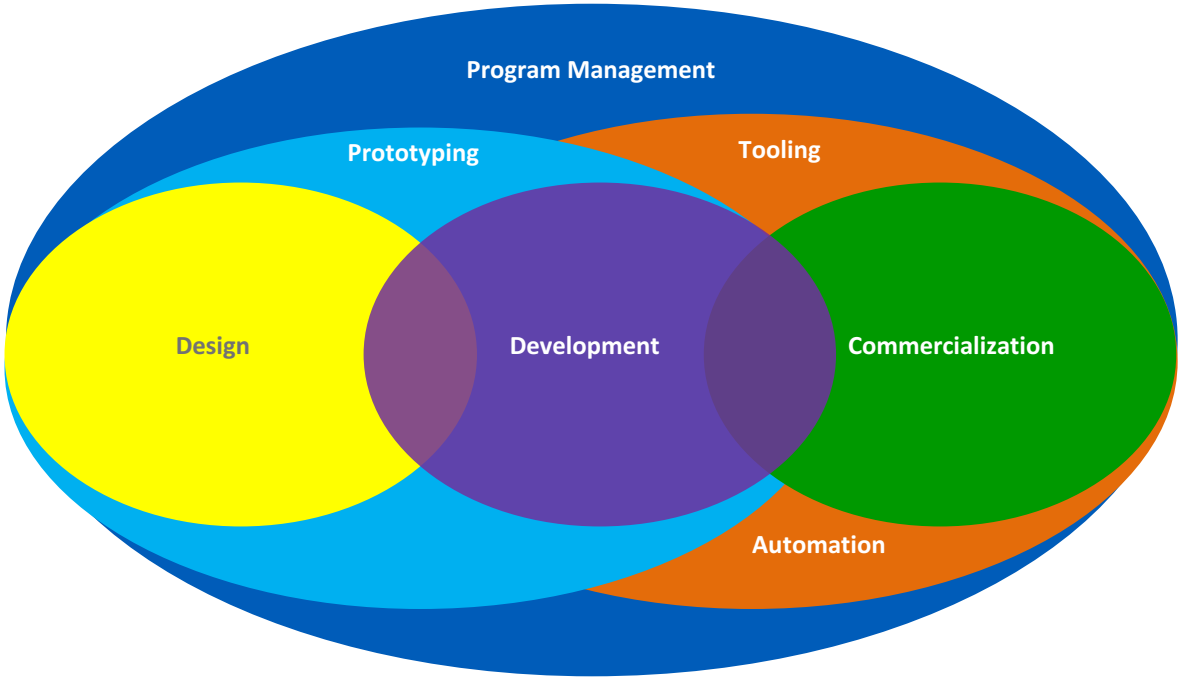


Elastomer Seal with 2-shot Molding

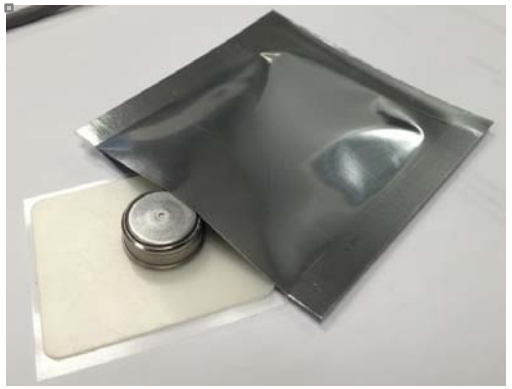
# CORE CAPABILITIES

## DESIGN, DEVELOPMENT & PRODUCTION: CONCEPT TO LAUNCH

- In-house program management & cross-functional capabilities
- “Moisture Budget” analytical tools and process




“Moisture Budget” RH testing



# INDUSTRIES SERVED

Pharmaceutical/OTC




Industrial

# INDUSTRIES SERVED

## Diagnostics




## Food/Nutrition



# ORAL SOLID DOSE/BOTTLE NEEDS & CHALLENGES

# ORAL SOLID DOSE STABILITY

## Needs & Challenges

- Moisture
- Oxygen
- $CO_2$
- Reactive Impurities
- Odors
- Combination of moisture & gas scavenging

# ORAL SOLID DOSE BOTTLE PACKAGING

## Needs & Challenges

- Standard, CR/SF closures
- Standard, tamper-evident features
- Efficient filling and reduced downtime
- Limited particulates
- No product breakage
- Consumer safety & satisfaction
- No hazards

# EXISTING SCAVENGING OPTIONS FOR STANDARD BOTTLES

# STANDARD BOTTLE SCAVENGING OPTIONS

## Cap-Based Features/Benefits

- Assembled to inside of the cap
- Doesn’t rest amongst contents of packaging
- Ok for anti-breakage packaging additions
- Doesn’t interfere with CR/SF caps
- “Hidden” from consumers

# STANDARD BOTTLE SCAVENGING OPTIONS

## Limitations

- Can’t be used with induction sealing
- Limited uptake/shelf life
- Quick desiccant saturation without immediate recapping
- Risk of desiccant spillage if damaged during shipping or assembly

# STANDARD BOTTLE SCAVENGING OPTIONS

## Drop-In Features/Benefits

- Dropped into bottle during packaging
- Rests amongst contents of packaging
- Doesn't interfere with CR/SF caps
- Can be used with induction sealing

# STANDARD BOTTLE SCAVENGING OPTIONS

## Limitations

- Equipment costs/extra assembly steps
- Breakage/dusting with negative quality cost/consumer perception
- Fully visible to consumer – represents source of confusion/annoyance or hazard
- Risk of being discarded by consumer
- Multiple pieces to achieve shelf life requirements

# ENGINEERED POLYMERIC SOLUTIONS

# PHARMAPUCK™ SCAVENGING DEVICES

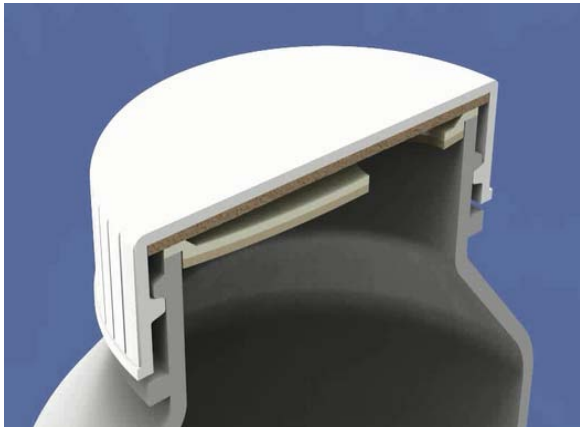
- Provides all your moisture, $CO_2$, & odor management needs into Drop-In or Cap-Integrated formats
  - Can scavenge, moisture, odors and VOC's/Reactive Impurities
  - Can release aroma for enhanced consumer experience
- Available in variety of custom shapes  including containers
  - Doesn't require extra equipment
- Optimized capacity and uptake rates

# PHARMAPUCK™ SCAVENGING DEVICES

- Custom printing & coloring for drop-in means:
  - Enhanced branding
  - Reduced consumer confusion
  - Helps reduce risk
  - Integrated cap can make product virtually invisible to consumer

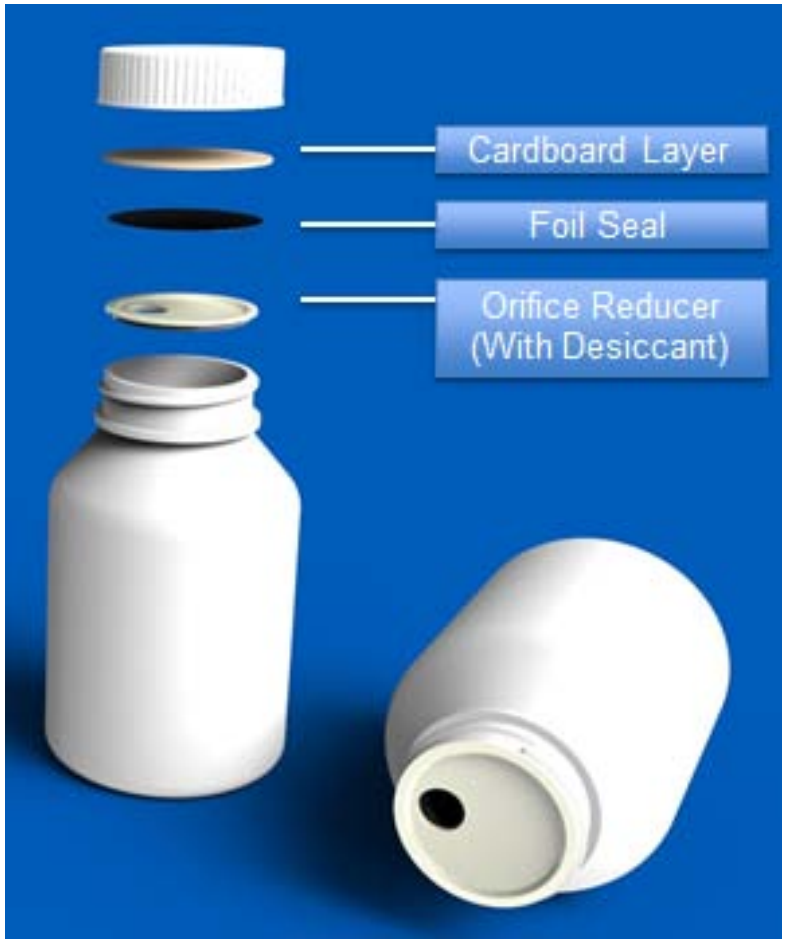
# ACTIV-SEAL™ ORIFICE REDUCERS

- Provides moisture, VOC's, and/or odor management in an orifice reducer for bottle applications
  - Scavenge moisture, reactive impurities, or odors
  - Integrated tamper-evident features
  - Can release aroma for enhanced consumer experience
  - Invisible to consumer - it can help to increase patient compliance and maintain shelf life requirements
- Optimized capacity and uptake rates



# ACTIV-SEAL™ Orifice Reducer

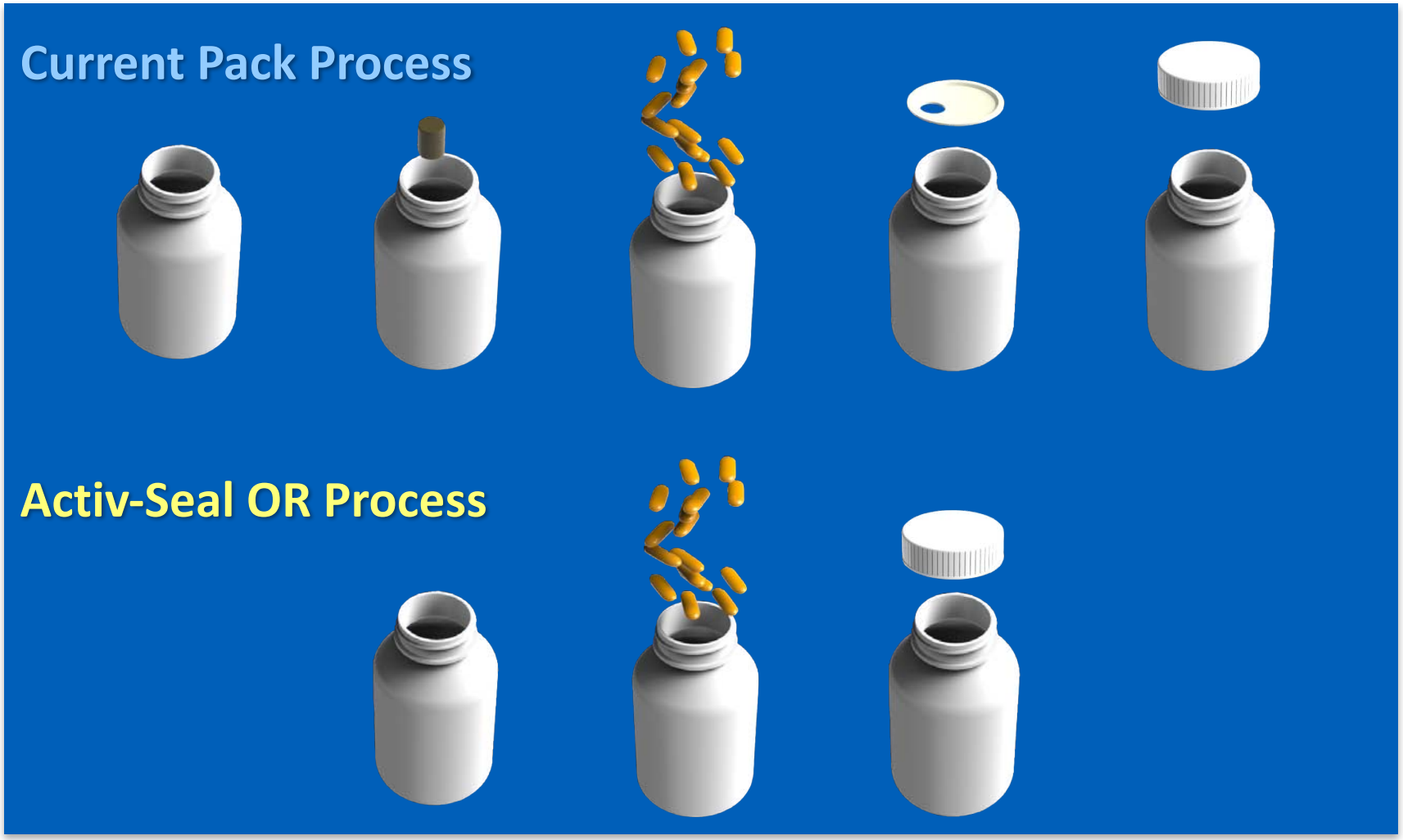
- Can be applied with standard capping & induction sealing systems
- Provides foil seal, orifice reducer & desiccant within cap
- Orifice reducer is permanently secured to the bottle via induction sealing
  - Lift and peel foil technology for tamper evidence & product stability



# ACTIV-SEAL™ Orifice Reducer

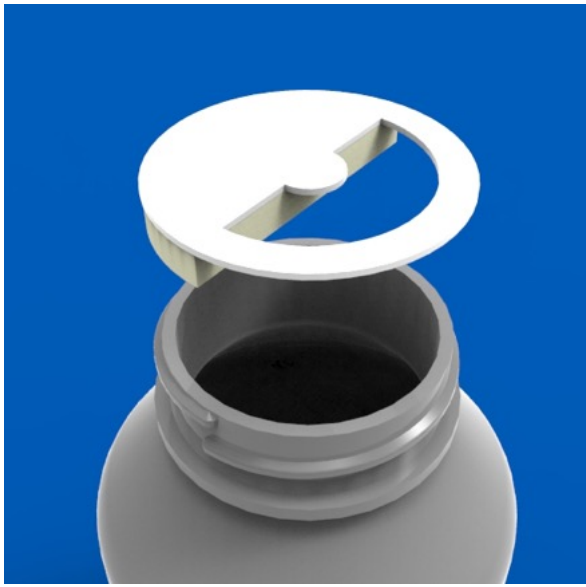
- Desiccant and reducer permanently positioned under orifice
  - No printing required - “Do Not Eat”
  - Desiccant never leaves bottle
  - Improved safety
  - No secondary inserting required
- Orifice reducer opening can be tailored to accommodate your product size to ensure optimum metered dosing

# Packaging Process



# ACTIV-SEAL™ ORIFICE REDUCERS

- Product protection never leaves the bottle, even after opening
- Reduction in assembly steps, complexity, & cost with one molded piece for all scavenging needs
- Fits all standard bottle sizes and maintains standard capping processes
- Customized kinetics/uptake rates with test and development service and support
- Can increase patient compliance



# PORTFOLIO SNAPSHOT

NEW

PHARMAPUCK™ SCAVENGING DEVICES

ACTIV-SEAL™ CLOSURES

ACTIV-BLISTER™ SOLUTIONS

ACTIV-FILM™ MATERIALS

ACTIV-VIAL™ PORTFOLIO

MOLDED COMPONENTS

ACTIV-POLYMER™ TECHNOLOGY

ASEPTIC SAMPLING

# DO NOT COMPROMISE

- Manage your packaging environment just the way you want, for as long as you need
- Scavenge moisture and gasses with one, virtually unbreakable piece
- Utilize existing equipment and processes
- Reduce your costs and complexity
- Have a one-stop partner who can design, test, and produce just for you

CSP TECHNOLOGIES℠

Your product, actively protected

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