

# Best from two worlds: SiOPlas™ primary containers

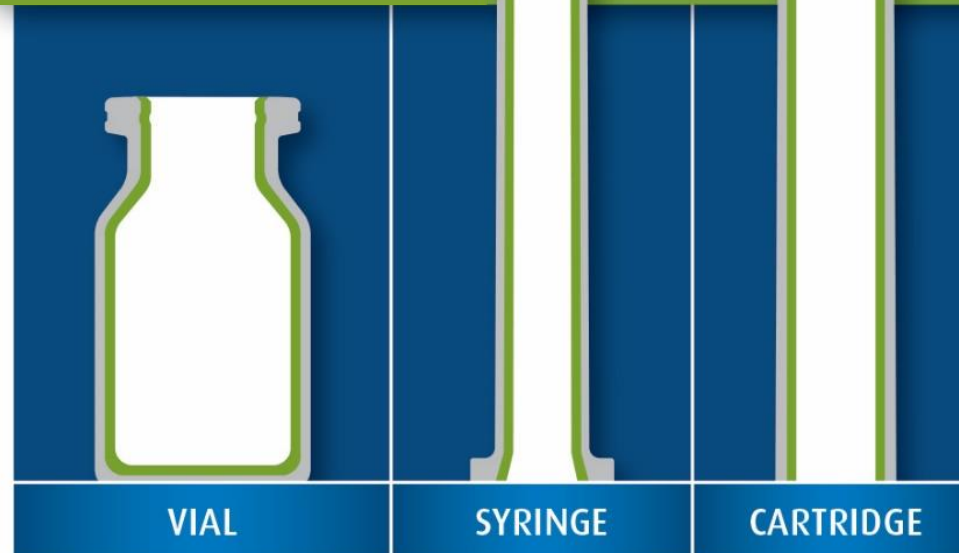
## Enhance the favorable qualities of plastic

- Resistance to breakage
- Excellent dimensional tolerances

## Retain the beneficial qualities of glass

- Barrier to gases
- High Optical Clarity
- Barrier to solutes (leachables/extractables)

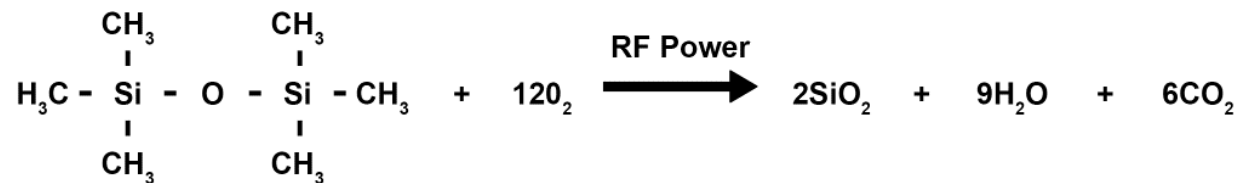
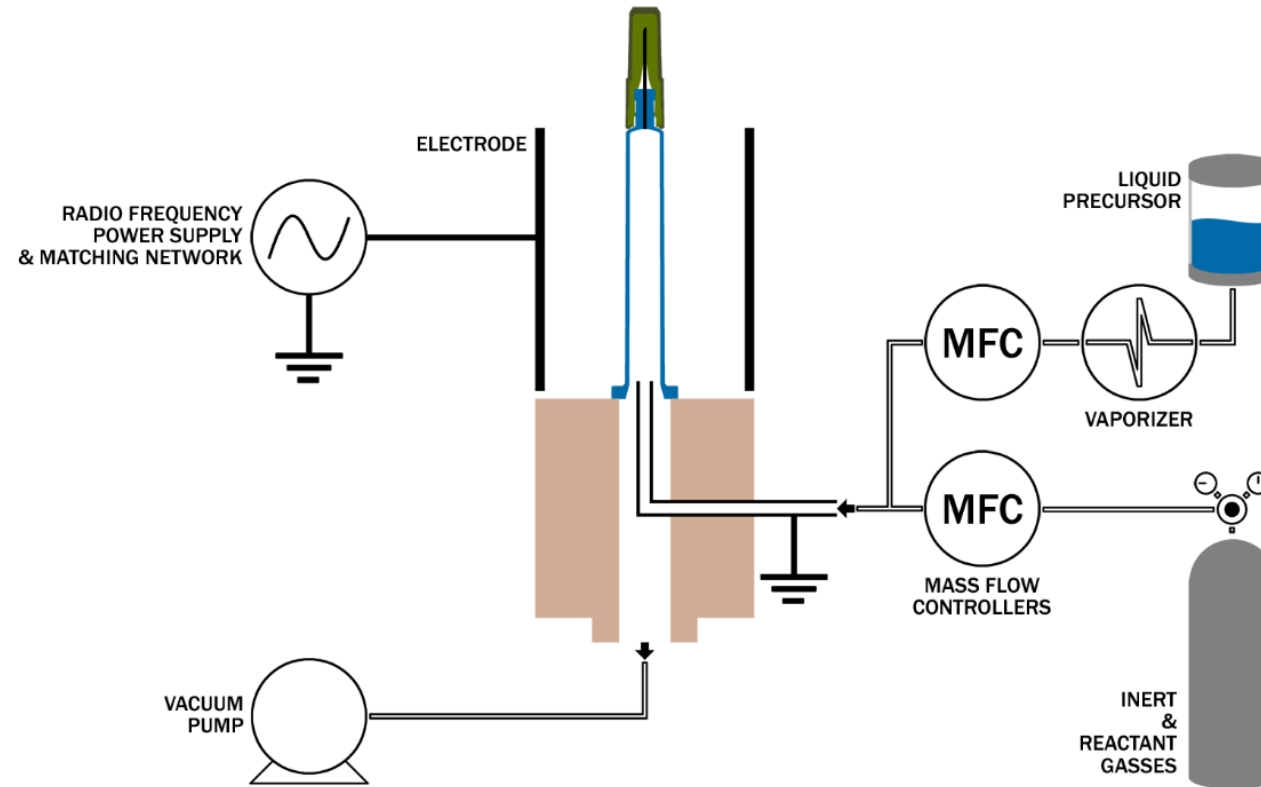
### SiOPLAS™ PRIMARY CONTAINERS



PRIMARY CONTAINER  
BARRIER COATING SYSTEM

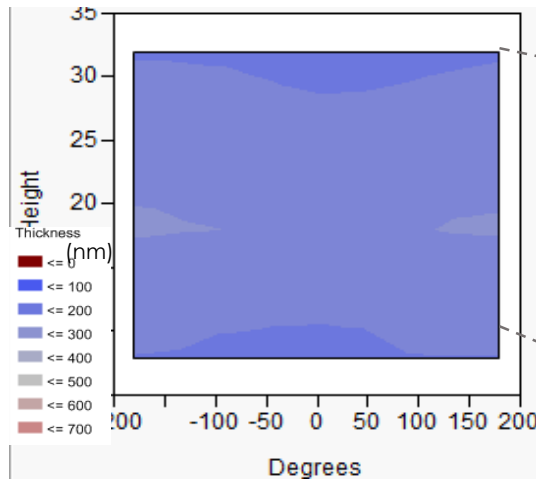
# Coating Deposition Process

## Plasma Enhanced Chemical Vapor Deposition - PECVD

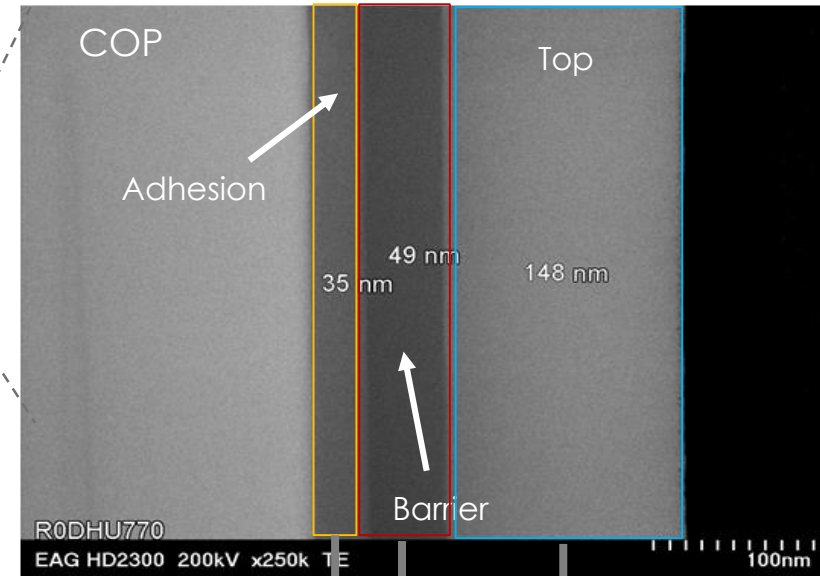


# Barrier Coating System Architecture

Coating Thickness Map



Transmission Electron microscopy (TEM) Coating Cross-section



Barrier Coating

- Adhesion to COP
- Relieves stress on Barrier Layer
- Decouples defects between Barrier & COP

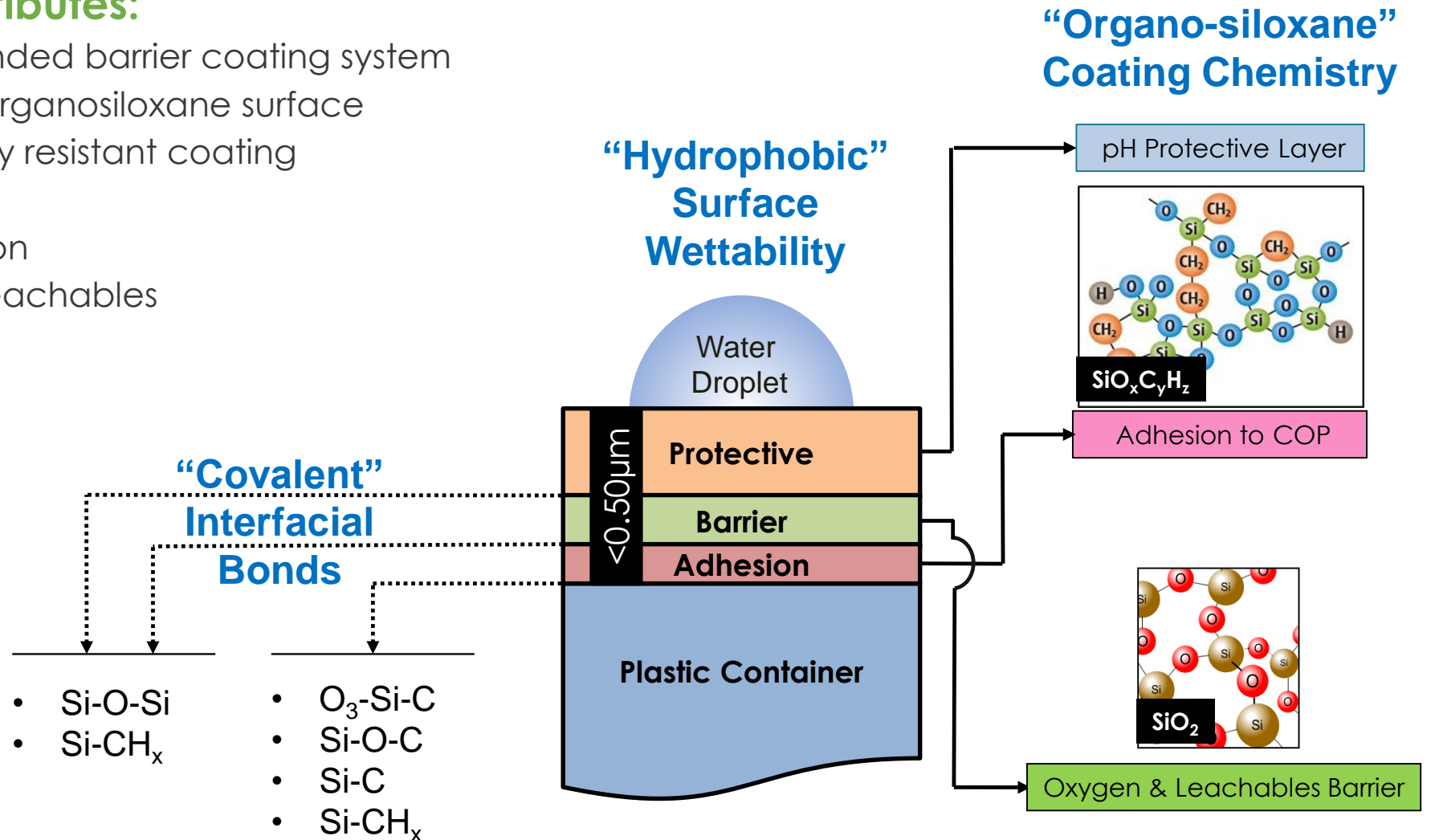
Barrier to oxygen & extractables

Protection against pH (4-8) & surfactants

# Barrier Coating System Surface Characteristics

- **Key Surface Attributes:**

- Covalently bonded barrier coating system
- Hydrophobic organosiloxane surface
- Inert chemically resistant coating
- Resists pH shift
- Low Si dissolution
- No metal ion leachables



# Product Attributes and Benefits

- **Product purity**
  - No silicone oil
  - Outstanding chemical resistance, protects sample integrity
  - Effective block of E&L due to barrier coating
- **Protection against oxygen transmission**
  - Oxygen transmission rates rival that of glass containers
- **Package durability**
  - Supports a wide range of temperatures
  - Compatible with many sterilization methods (EO, Ebeam, Steam)
- **Eliminates risk for breakage**
  - Eliminates shattering of glass throughout supply chain
  - Reduces end-user complaints and recalls
- **Tight dimensional control**
  - Products are all precision-molded
- **Customized surface characteristics**
  - Hydrophobic or hydrophilic surface characteristics
- **Consistency and reliability**
  - Advanced technologies to assure coating of every product shaped
  - Six-Sigma quality performance



 =differences to plain COP containers

# Fully automated coating lines: Vial and syringe coating



- Process incorporates real time monitoring of all key process variables and 100% in line inspection for critical to quality attributes.
- State-of-the art visual particle control systems: online inspection of empty vials: 50µm

# Fully automated modular coating lines



- All coating operations take place in one station without moving the part
- Scale-up to 8-up configuration
- Plug and Play manufacturing concept to allow for seamless scale-up / maintenance with minimized downtimes