



## Envasado aséptico: últimos desarrollos Aseptic packaging: latest developments

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Juan Jesús Martín (KRONES)

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## **Envasado aséptico: últimos desarrollos**

**Juan Jesús Martín ·**

**Director Comercial KRONES Ibérica**



## The Krones Group worldwide:

- 14,443 people.
- 90% products sold abroad.
- 2015's consolidated sales: 3,391 b€.
- >80 sales and service companies.



Krones is headquartered in Neutraubling (Germany). The group plans, develops and manufactures machines and complete lines for the fields of process, filling and packaging technology.

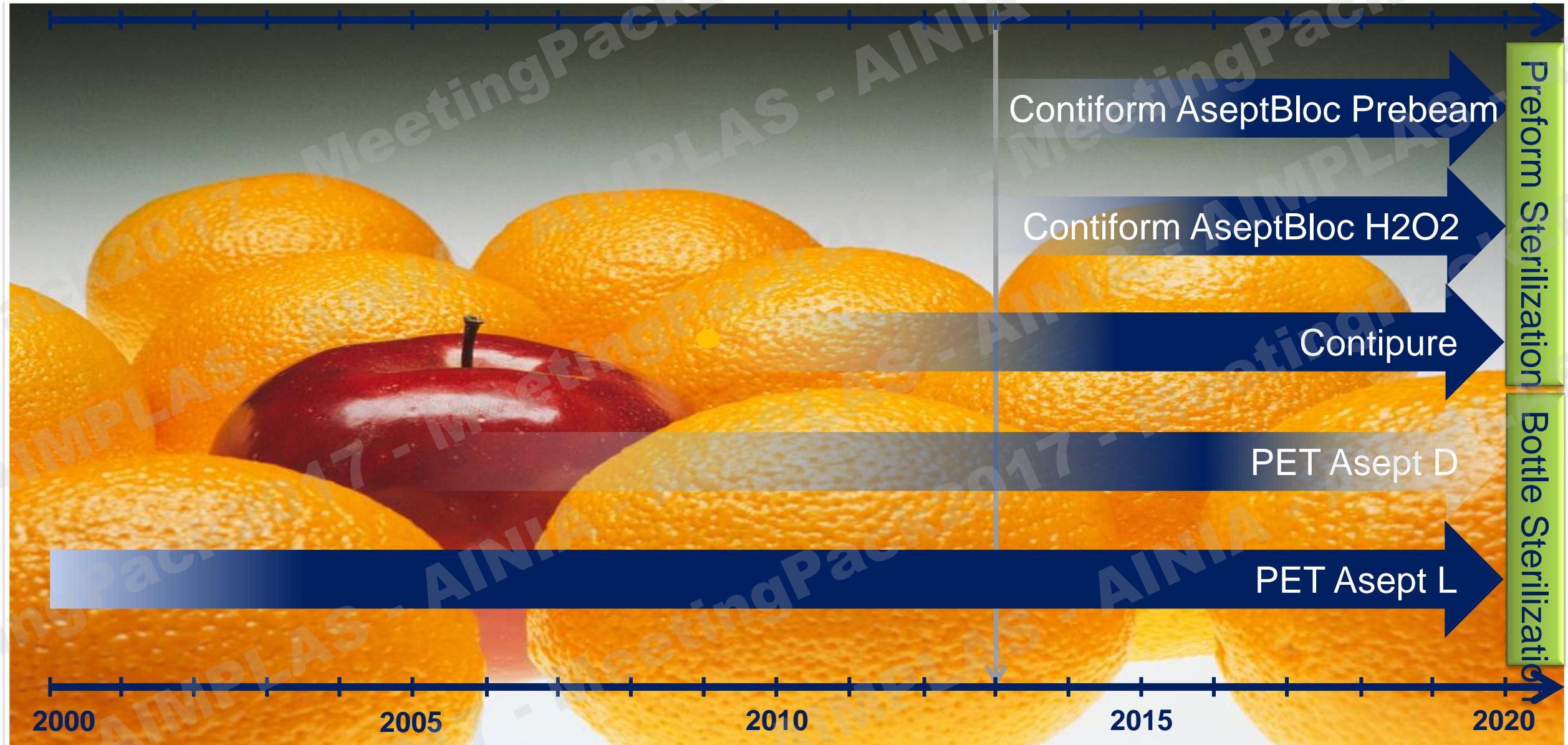
Since being founded in 1951, Krones has become far more than a traditional-style machinery and line manufacturer: Mechanical engineering, line expertise, process engineering, microbiology and information technology have been harmoniously integrated for optimum synergies.

More than 5,000 full and utility patents bear witness to the company's innovative potential.

# Microbiological sensitivity of beverages

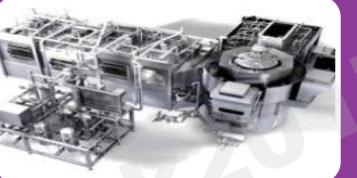
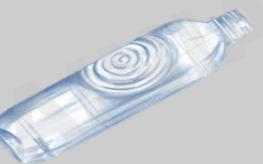


## Success story





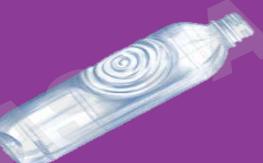
## PET Asept L2



## PET Asept D



## PET Asept D Compact



## Contiform AseptBloc [H<sub>2</sub>O<sub>2</sub>]



## Contipure D

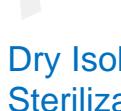


 Bottle  
Sterilization

 Preform  
Sterilization

 Low Acid

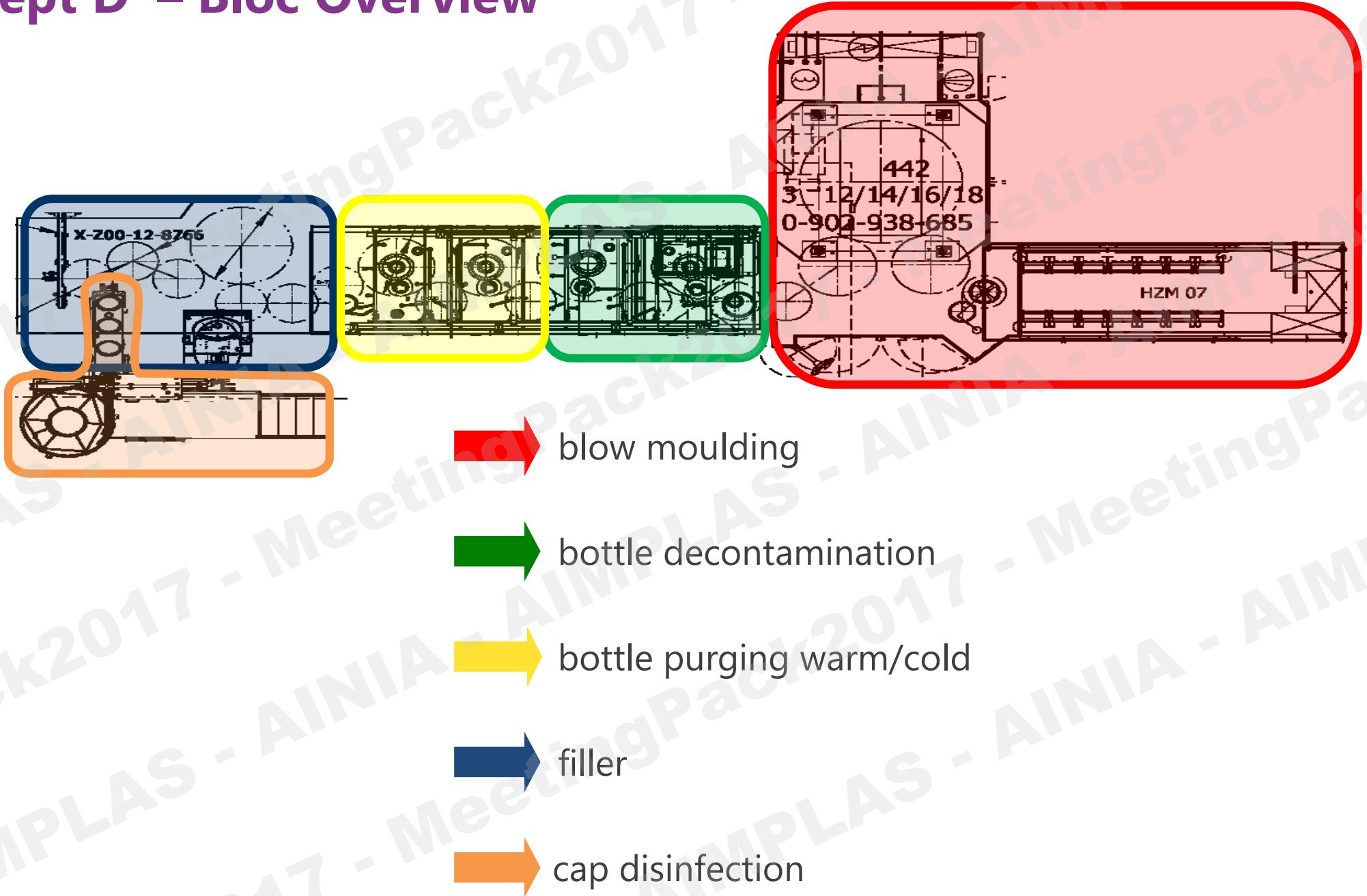
 High Acid

 Dry Isolator  
Sterilization

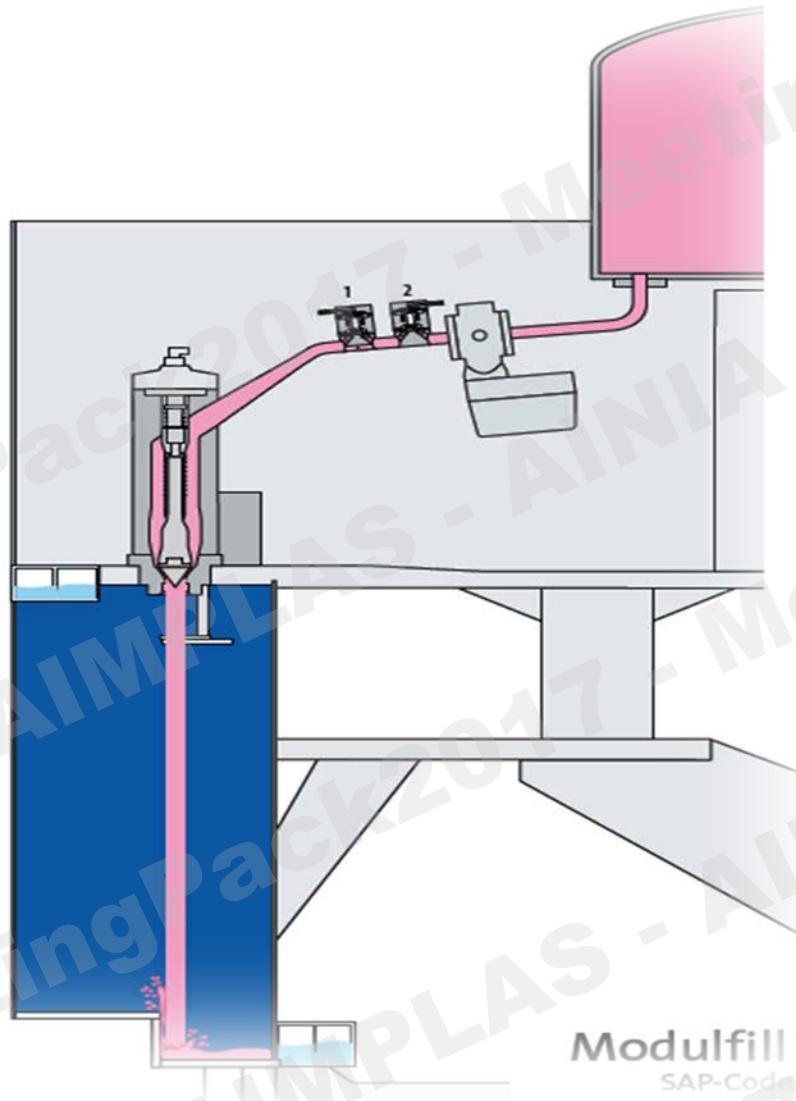
 Wet Isolator  
Sterilization

 Filling Valve  
Steamable

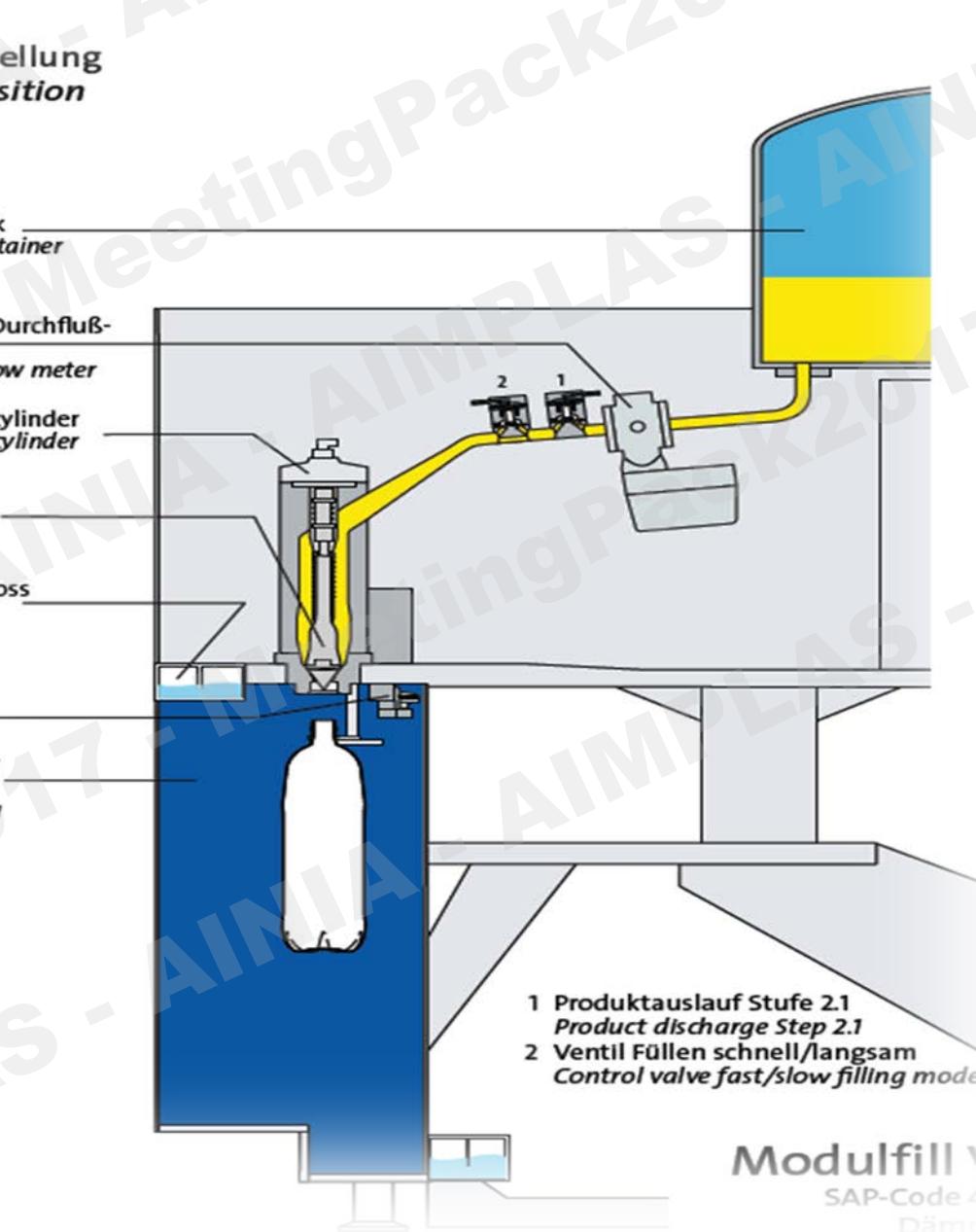
## PET-Asept D – Bloc Overview



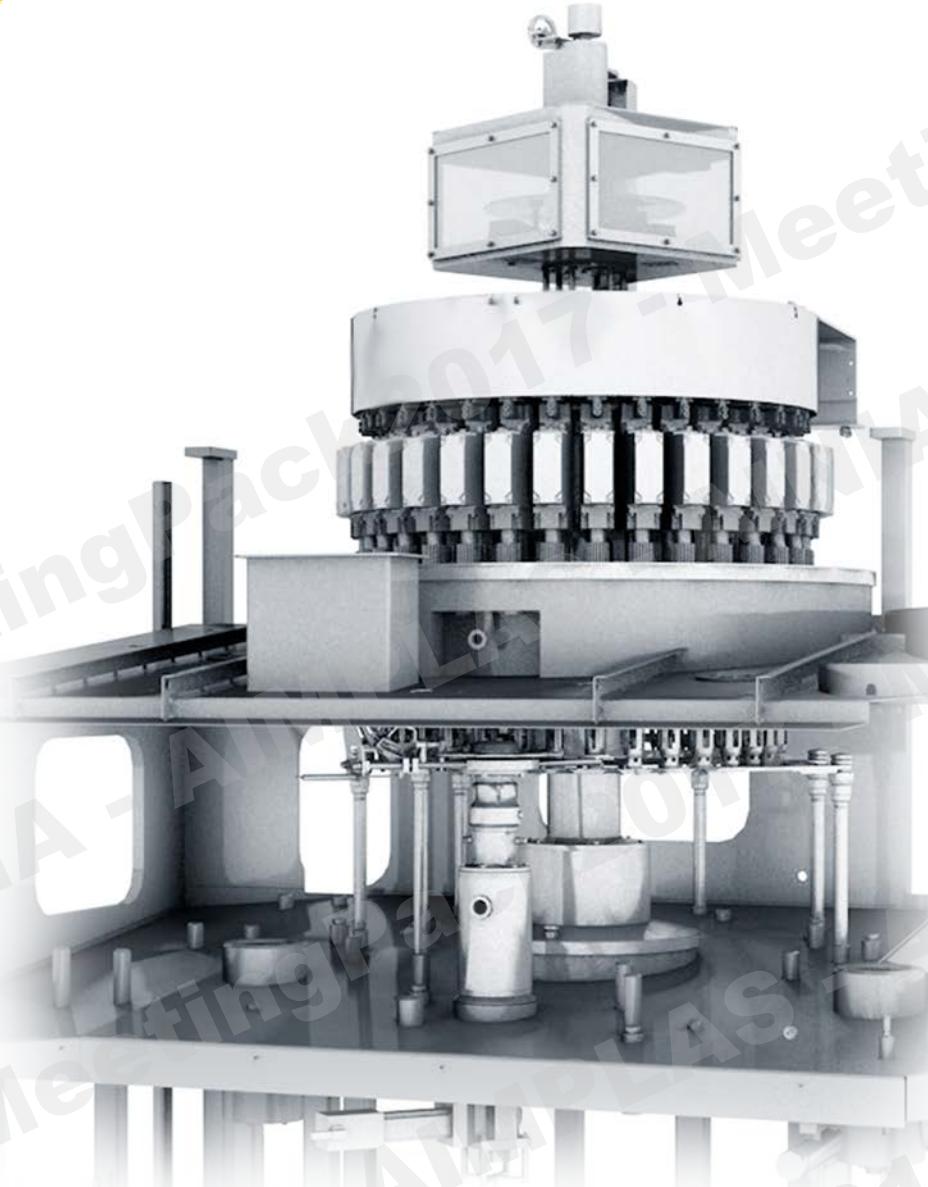
# PET Asept - Aseptic Filler



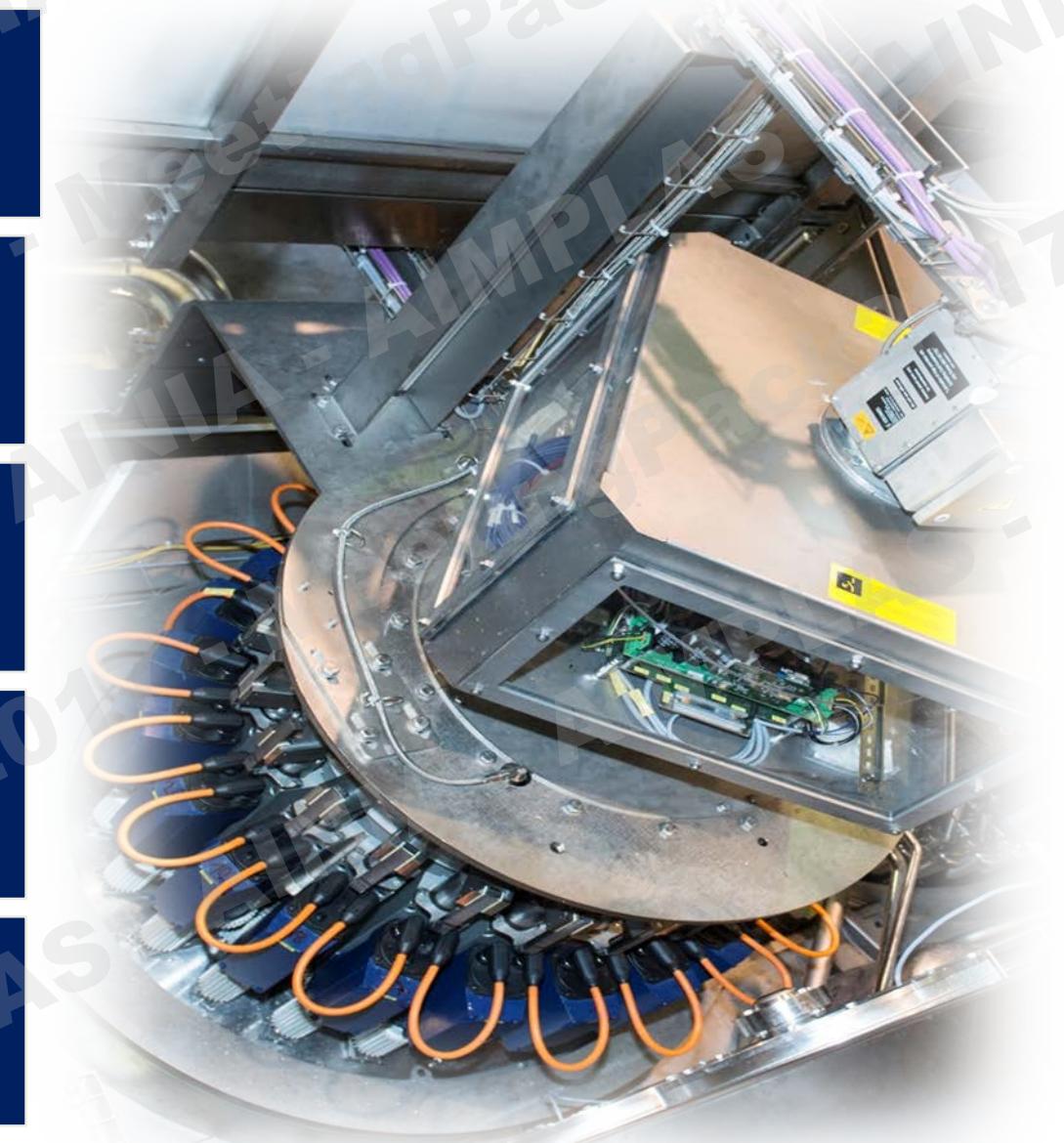
- Product feed via slipring distributor from top.  
Distributor with steam barrier
- Sterilization with steam,  
no hot water sterilization
- No CIP-return distributor necessary – open CIP into isolator
- Reduced product loss  
Highest microbiological safety
- Reduced times for sterilization  
Increased maintenance intervals



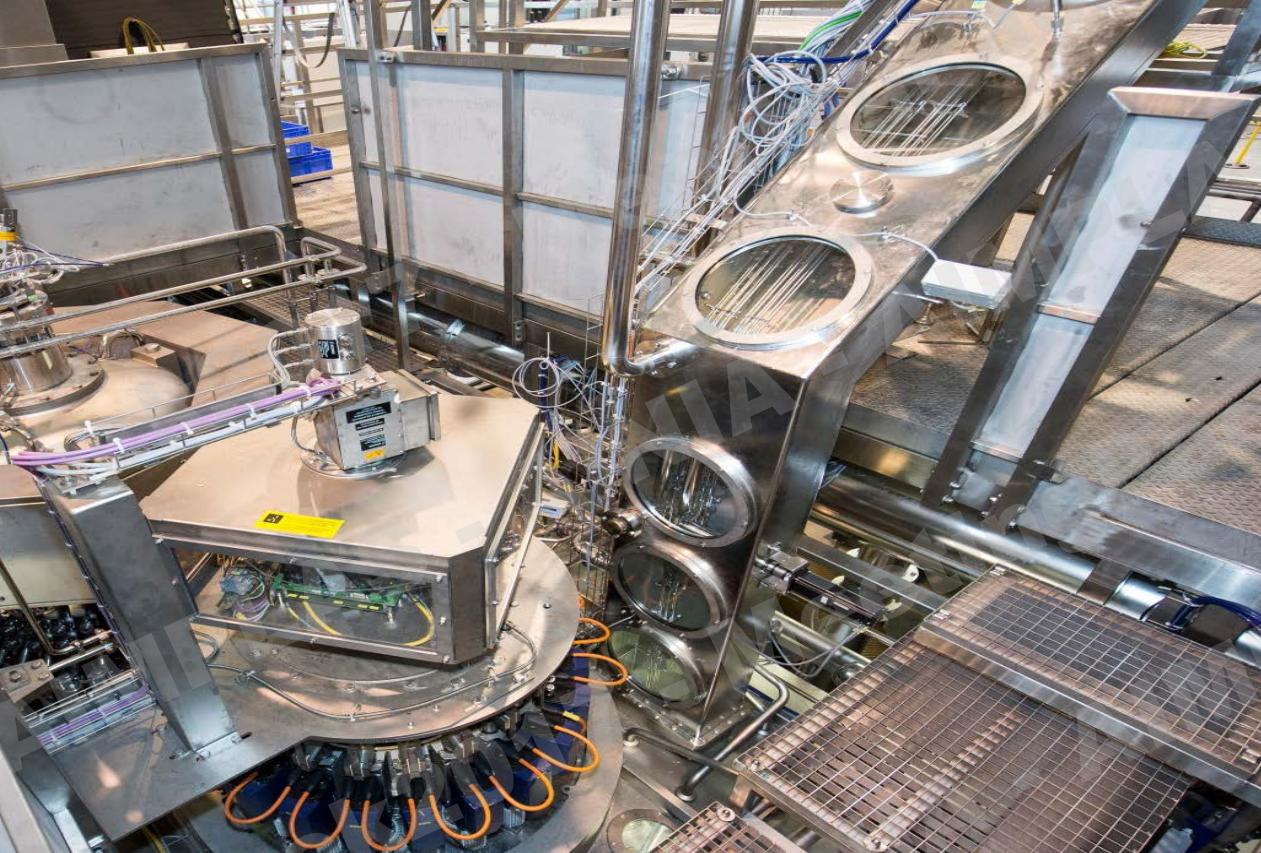
# Aseptic Servo Capper



- No drive units inside isolator
- Minimized number of mechanical movements in isolator
- Rotating vs. Static Part – Separated by liquid barrier
- Electrical Cabinet outside isolator
- Totally modified discharge belt to avoid any recontamination



# Cap Sterilization with vaporized H<sub>2</sub>O<sub>2</sub>



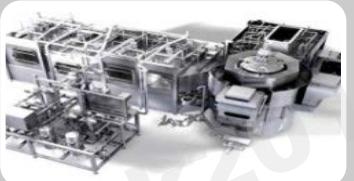
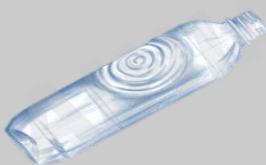
- Simple mechanical design
- Short treatment time at higher temperatures
- Last bottle – Last closure
- Used in all completely dry systems:
  - PET-Asept D
  - PET-Asept D Compact
  - Contiform AseptBloc
  - Contipure D

New cap sterilization with a simple, reliable and robust design

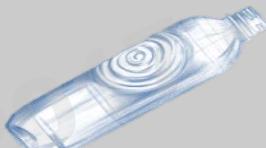
new design based on old designs, which is not possible with new



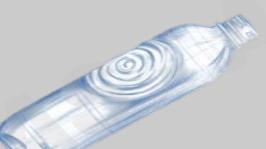
## PET Asept L2



## PET Asept D



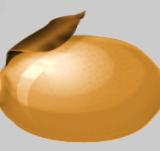
## PET Asept D Compact



## Contiform AseptBloc $[H_2O_2]$

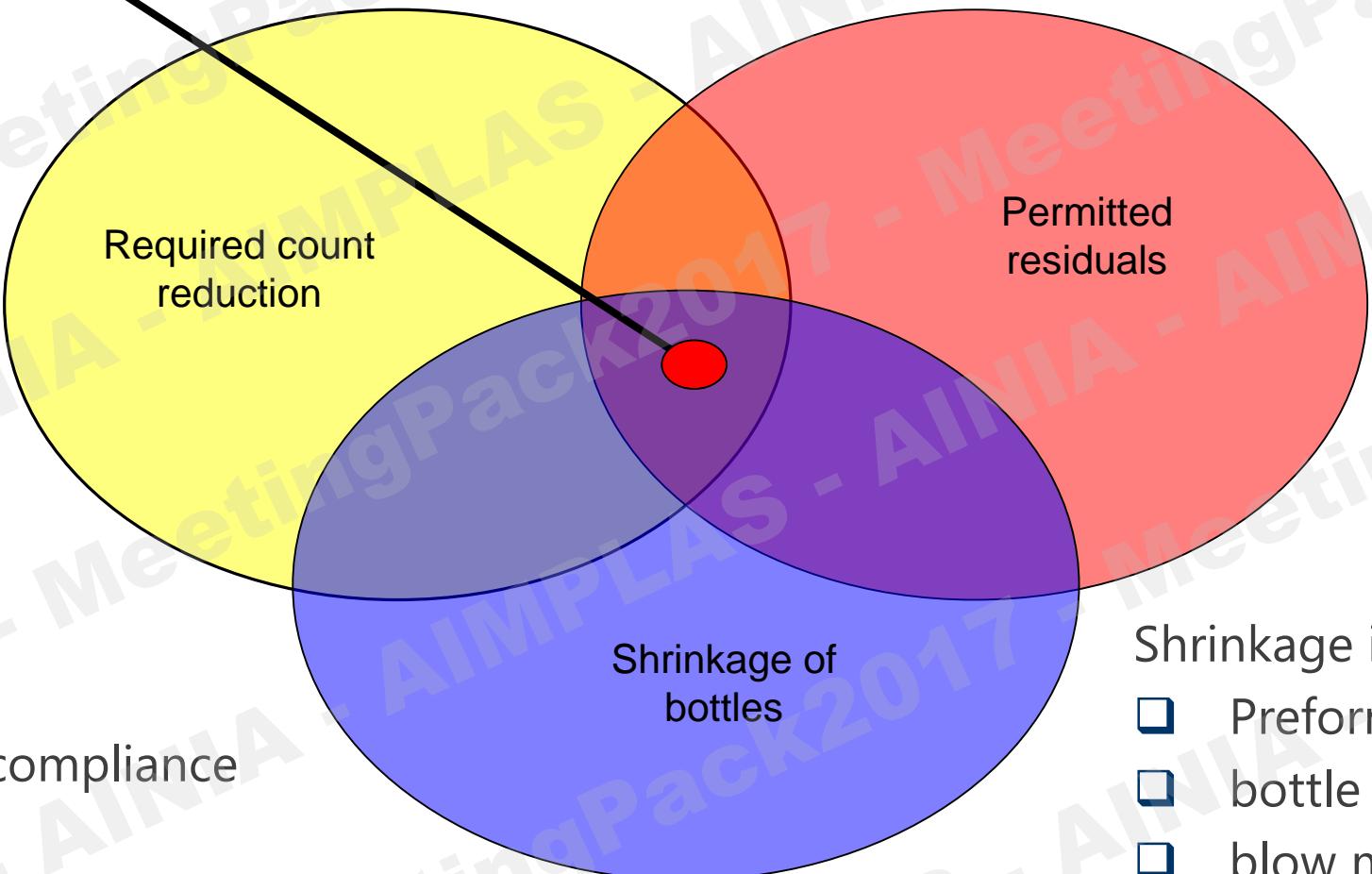


## Contipure D

 **Bottle  
Sterilization** **Preform  
Sterilization** **Low Acid** **High Acid** **Dry Isolator  
Sterilization** **Wet Isolator  
Sterilization** **Filling Valve  
Steamable****KRONES**

## Discussion: Process window for sterilisation process

Process window  
Bottle sterilization



Bottle sterilisation: Values for

- Shrinkage
- Residuals
- Count reduction have to be in compliance

Shrinkage influenced by

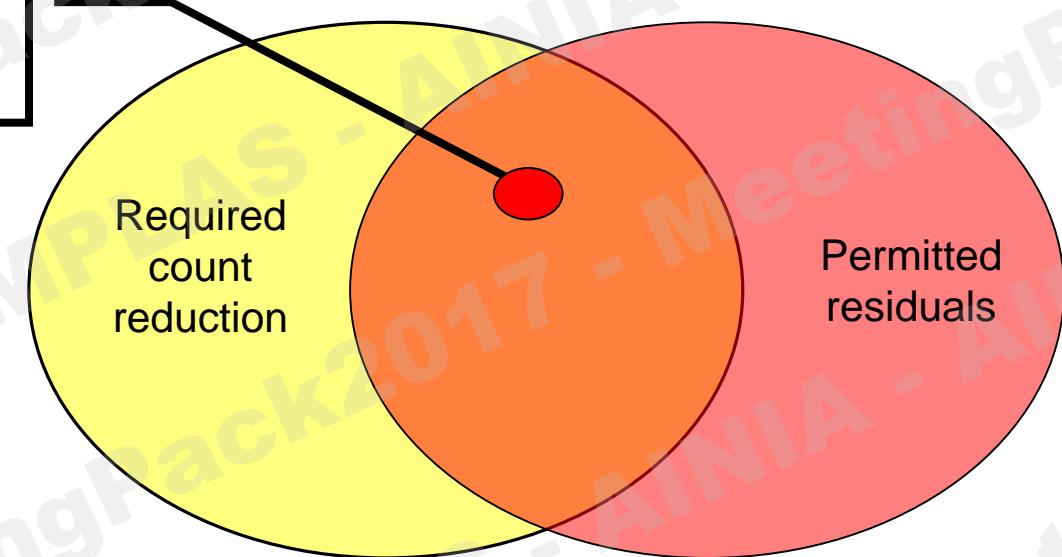
- Preform (form and resin)
- bottle design
- blow moulding process

Bottle Sterilisation: Narrow process window

Wobinwisselstijl  
Bottle sterilisation: narrow process window

## Discussion: Process window for sterilisation process

Process window  
Preform sterilization



- Preform sterilisation
- Simple shape for sterilisation
- Low surface to be sterilised
  - ⇒ Low residuals
- No shrinkage caused by sterilisation process
  - ⇒ Reduction of bottle weight
  - ⇒ No relax blow moulding process necessary
- Wide process window

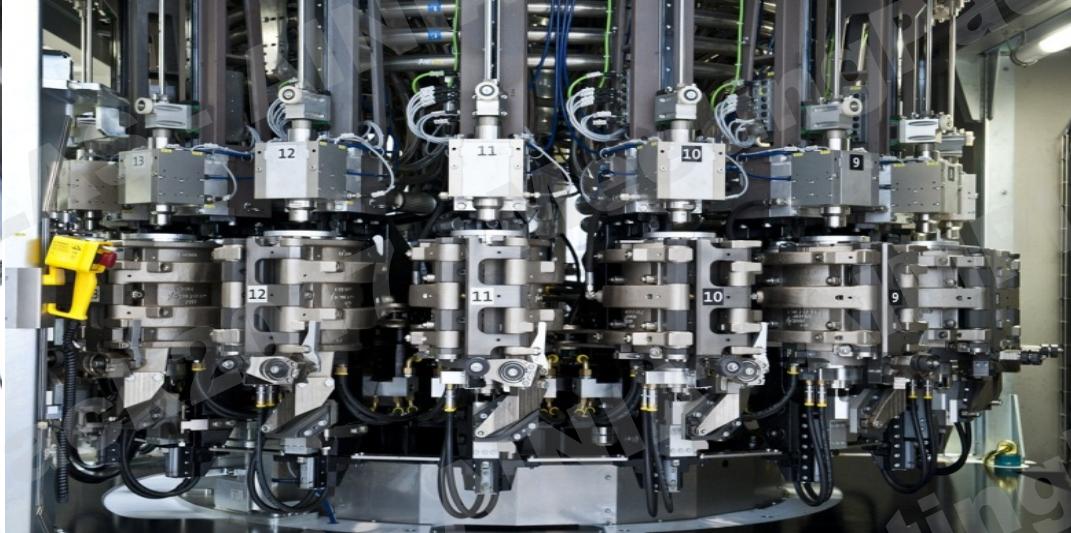
Preform Sterilisation: Safe and stable sterilization process

Bottle sterilisation slides bus: notes sterilisation process

# Conception of the Coniform AseptBloc (CAB)



Aseptic filling



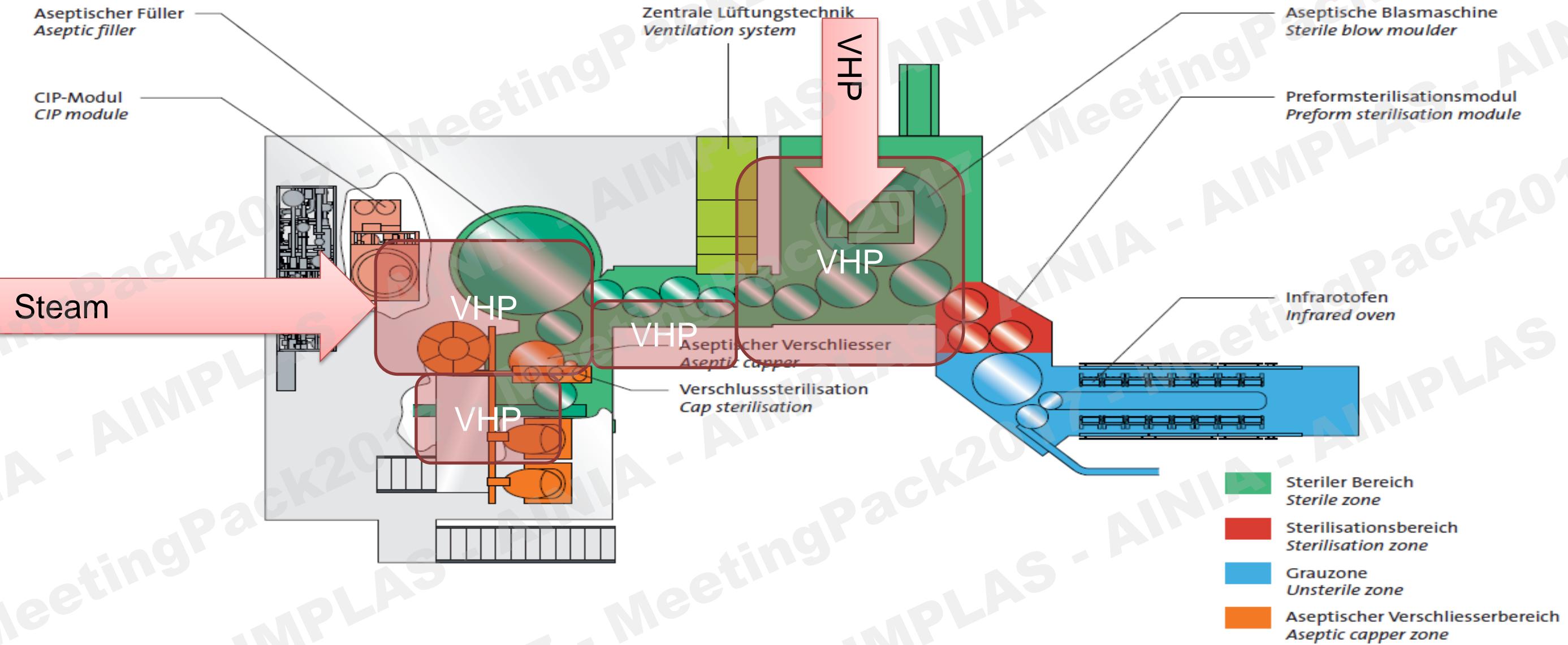
Blow moulding

## Coniform-AseptBloc

- Combine Krones knowledge of blow moulding and aseptic filling
- Reduce Size and complexity
- Aseptic filling requires a closed sterile chain from decontamination to capping.

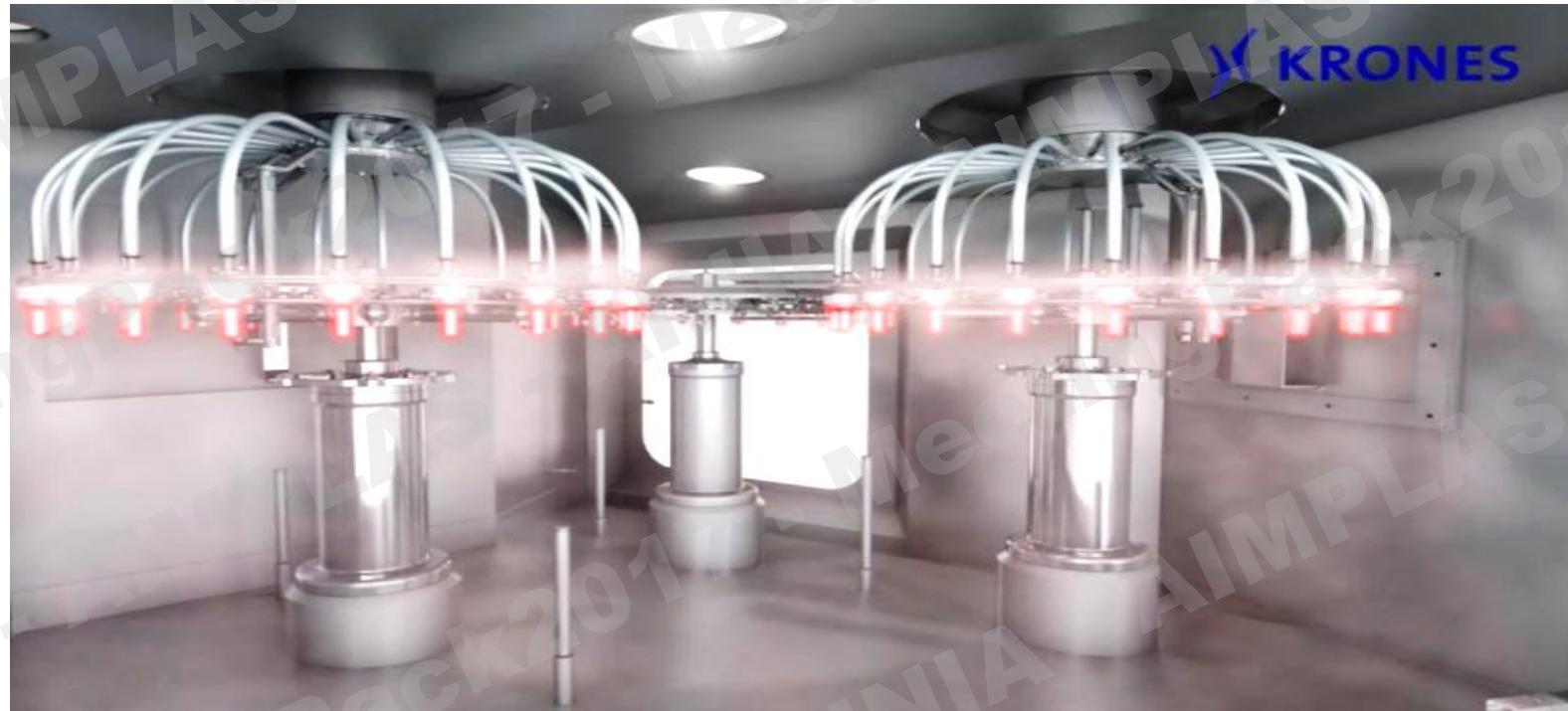
No compromise in safety!

# Contiform AseptBloc (CAB) – Sterilization (internal + external)



## Preform Sterilization

- Before passing the infeed of the infrared oven the preform is rinsed by ionized air
- Temperature profile is applied to the preform; this is necessary for the blowing process as well as for the dry sterilization to prevent condensation
- Preform is handed over to the sterilization module
- Sterilization of the preform with gaseous hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>)
- Simultaneously in- and outside sterilization because of the H<sub>2</sub>O<sub>2</sub> atmosphere
- The selective ventilation and the closed way of construction prevent the increase of the sterilization medium into the blow molder





## Aseptic Blow Moulder

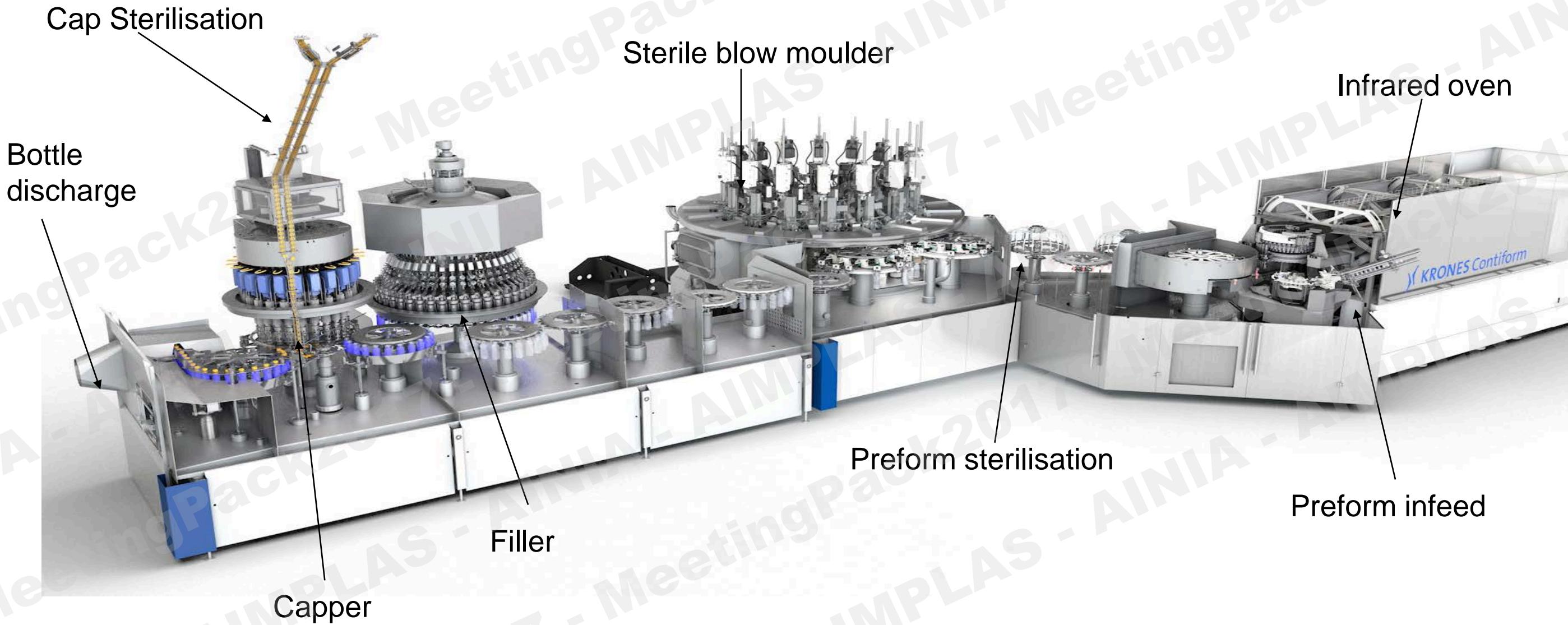
- Sterile preform is transferred to the aseptic blow moulder
- Bottle is blown under aseptic conditions
- Blowing wheel is equipped with a liquid lock to separate the sterile and unsterile area
- During the entire stretch blow molding process the stretching rod never leaves the sterile zone
- Air flow: the blow molder is provided with overpressure; conditioned air prevents condensation in the blow mould area
- All components that are involved in the blowing process can be completely sterilized!



# Contiform AseptBloc (CAB)

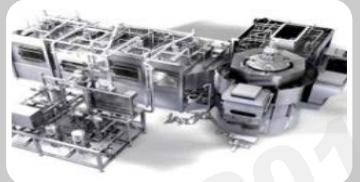
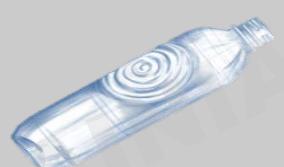


## Contiform AseptBloc (CAB) - View without isolator housing

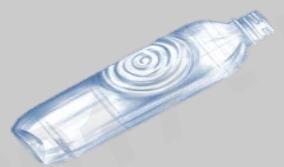




## PET Asept L2



## PET Asept D



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## Contipure D



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Sterilization

Preform  
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Low Acid

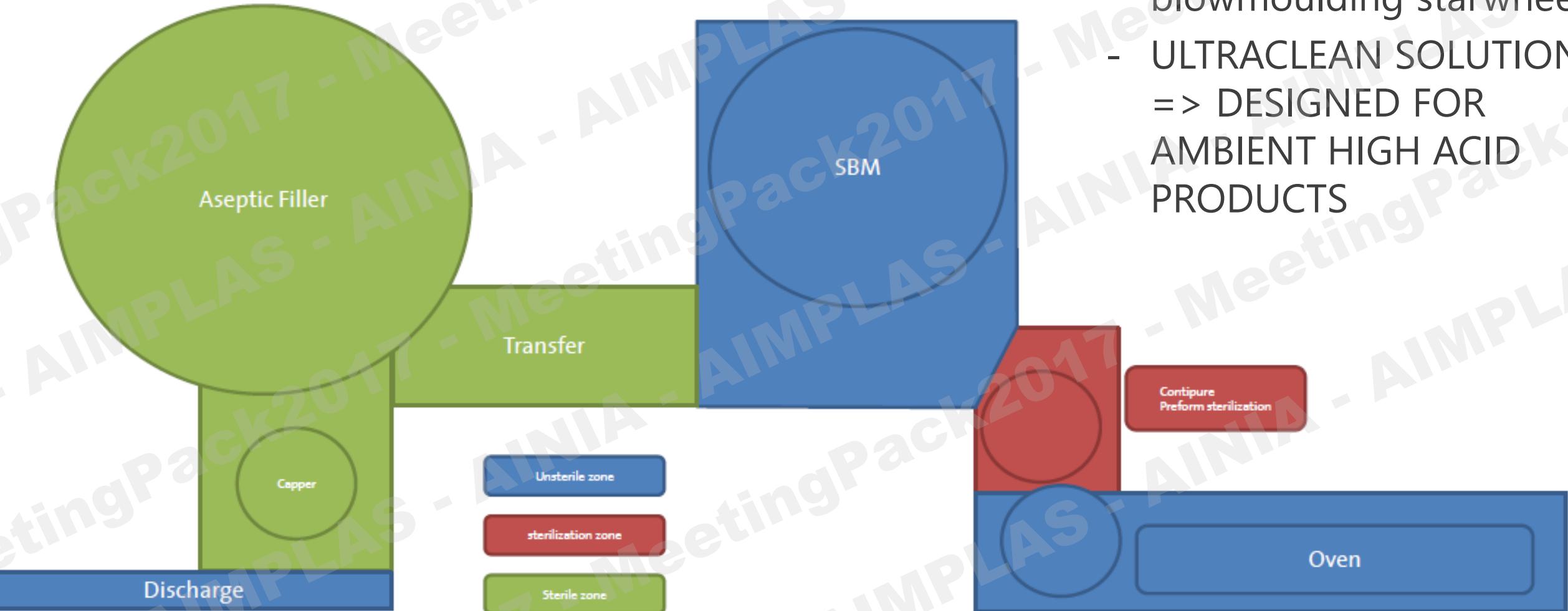
High Acid

Dry Isolator  
Sterilization

Wet Isolator  
Sterilization

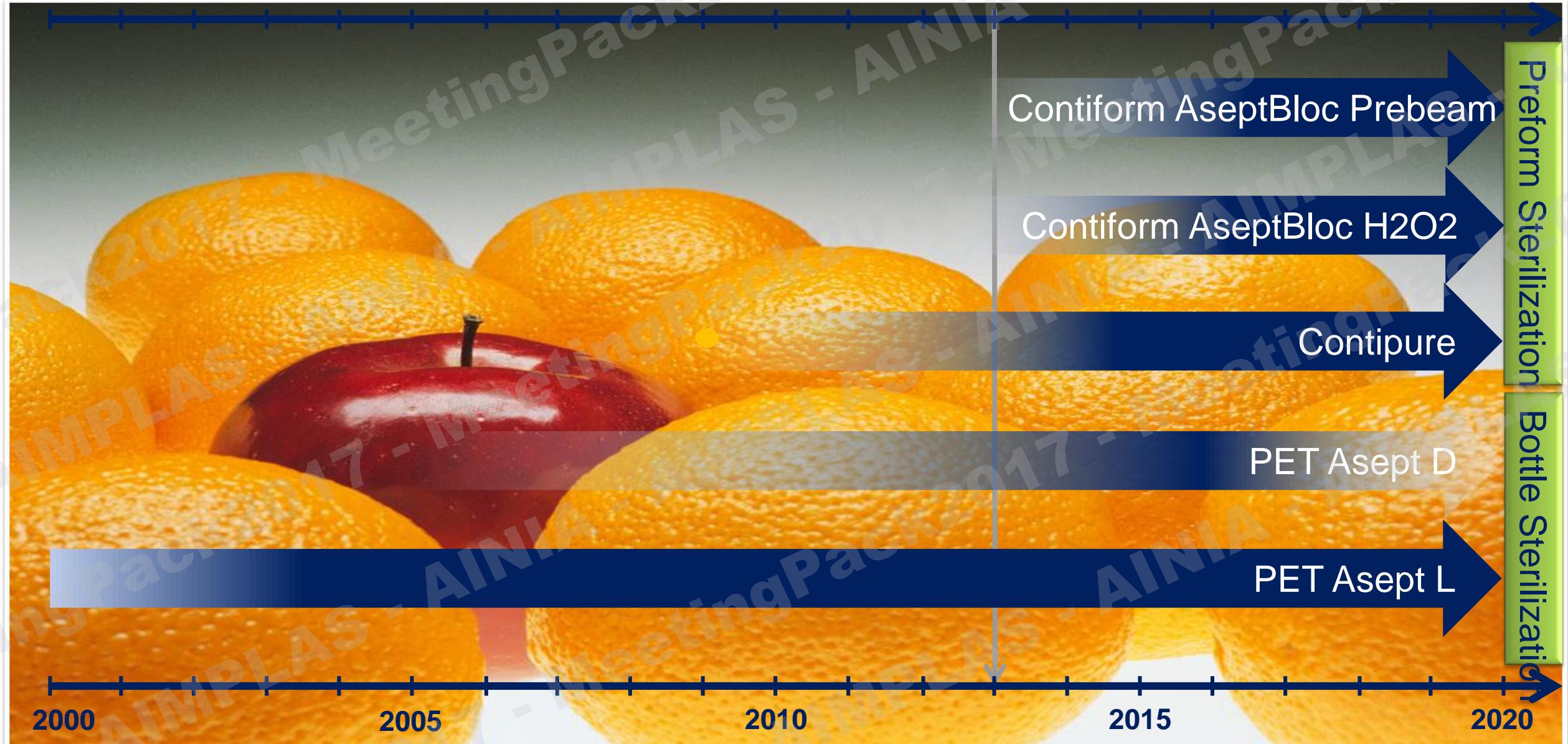
Filling Valve  
Steamable

## Contipure + Isolatorfiller



- Blowmoulding carousel in standard design
- Sterile zone starts after blowmoulding starwheel
- ULTRACLEAN SOLUTION => DESIGNED FOR AMBIENT HIGH ACID PRODUCTS

## Success story



# PreBeam Technology



## What is new?

- Sterilization of packaging material with electronic beam technology instead of chemicals
- Preform sterilization between oven and blowmoulder
- Interiorsterilization over finger-emitter
- External sterilization over planar emitter

We do more.

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Thank you!

We do more.

 KRONES



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