



True End-to-End Solutions  
From Molecules to Final Dosage Forms





Dec Group, headquartered in Switzerland, is a leading global provider of powder handling, processing and containment systems.

Dec products offer a high level of safety for both operator and product.

From the raw material handling to the final packaging process, Dec acts as a global player throughout the production chain.

Customers benefit from comprehensive solutions from feeding reactors to the final product, increasing their productivity while respecting current legal requirements.



# Key Milestones



**2008:**  
Acquires Jetpharma product line, adding process isolators and micronizing technology



**2001:**  
Moves to current HQ in Ecublens, Switzerland. & Drum Containment System (DCS) launched.

**1992:**  
First PTS system is sold



**1987:**  
Dec is founded by Frederic F. Dietrich, Sr. and his two sons, Yves & Frederic. Introduces the concept of active powder handling



**2005:**  
Production factory in India & sales structure in Ireland established



**2009:**  
Opens subsidiaries in the US & Germany



**2003:**  
Celebrates the sale of its 1,000<sup>th</sup> Powder Transfer System to Bayer



**2007:**  
Opens sales office in the UK & subsidiary in Poland



**2014:**  
Dec Poland expanded to full manufacturing



**2014:**  
China subsidiary is opened



**2020:**  
Acquisition of Inno4Life in the Netherlands, adding fill/finish technology



**2019:**  
Takeover of Bectochem India powder handling division (DecBectochem)

**2020:**  
Dec Poland expands manufacturing with new facility



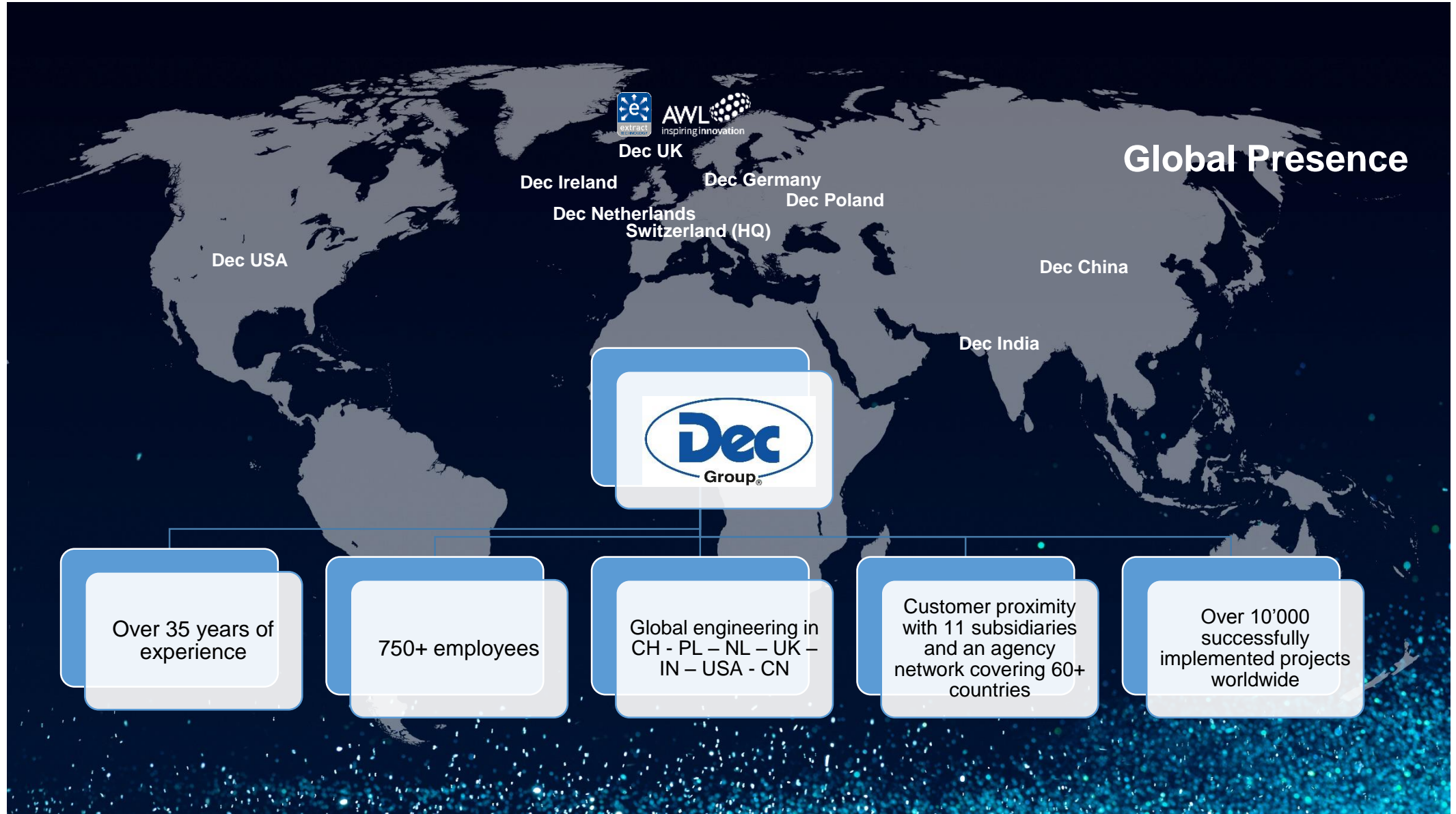
**2021:**  
Acquisition of Extract Technology



**2022:**  
Acquisition of Alconbury Weston Technology (AWL)



**2023:**  
Inauguration of new manufacturing facility in Mauston WI, USA





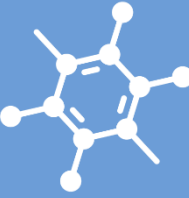
## Industries Served



Innovative solutions delivered worldwide for various industries where powder processing and liquid filling under strict and controlled conditions is essential.

### Chemicals

Fine chemicals, agrochemicals, specialty polymers, adhesives, dyes & pigments



### Pharma API

Manufacture and handling of active pharmaceutical ingredients



### Pharma Secondary Manufacturing

Oral Solid Dosage, orally disintegrating tablets, intravenous therapy, dry powder inhalers, sterile manufacturing



### Cosmetics

Particle size reduction, blending and handling technologies for powders



### Food

GMP compliant handling and processing systems for powder and granules



### Advanced Materials

Battery manufacturing, automotive industry, nuclear industry, explosives





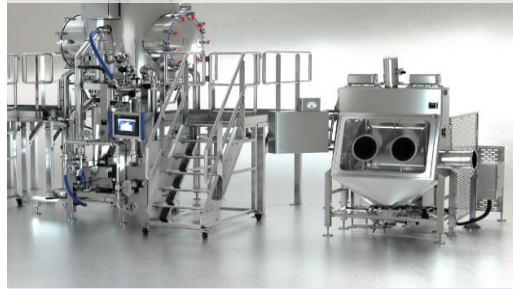
Dec  
TECHNOLOGY



- Sales of standard Dec technologies & equipment
- Supply of technically straightforward projects



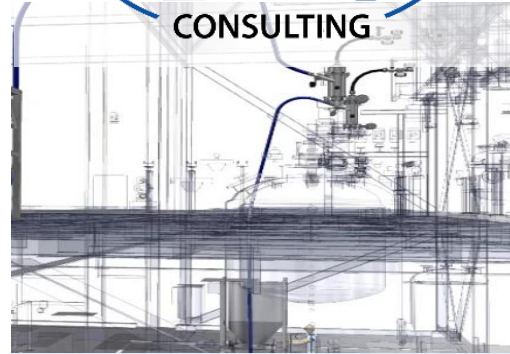
Dec  
ENGINEERING



- Sales of complex process integrated systems
- Supply of engineered & turnkey solutions
- High degree of project management



Dec  
CONSULTING



- Provision of consulting services
- Operator and product protection
- Sterile/aseptic process
- Supply of Front End Engineering Design Studies (FEED)
- Process development & education



Dec  
SERVICES



- Customer technical support
- Qualification & Validation
- After sales services & parts supply
- Maintenance programs
- System upgrades
- Testing Facilities
- Training



## Powder Handling Technologies



- Transfer
- Bulk Handling
- Dosing
- Mixing
- Sampling
- Contained and/or aseptic handling



## Particle Size Technologies



- Micronization
- Mechanical Milling
- Contained and/or aseptic milling



## Filling Solution Technologies



- Primary packaging filling for powder, liquids and gels into various delivery systems including dual-chamber syringes
- Secondary Packaging
- Serialization
- Contained and/or aseptic solutions



## Containment Solution Technologies



- Barrier systems and isolator technology
- Contained and/or sterile/aseptic isolators
- Downflow Booths, mobile clean rooms and workbenches
- Nuclear containment/radio pharmaceutical



## Continuous Processing Technologies



- End-to-End solutions
- From the raw material handling to reaction, crystallization, continuous filtration and drying to the final dosage form





## General Consultancy

CapEx / OpEx optimization - reduced down time – minimize or avoid product loss – plant evaluation and recommendations

## Safety Consultancy

Hazardous area classification – environmental safety reviews – HAZOPs and FMECAs – ATEX – GAMP – ergonomic safety review – risk assessment

## Engineering Expertise

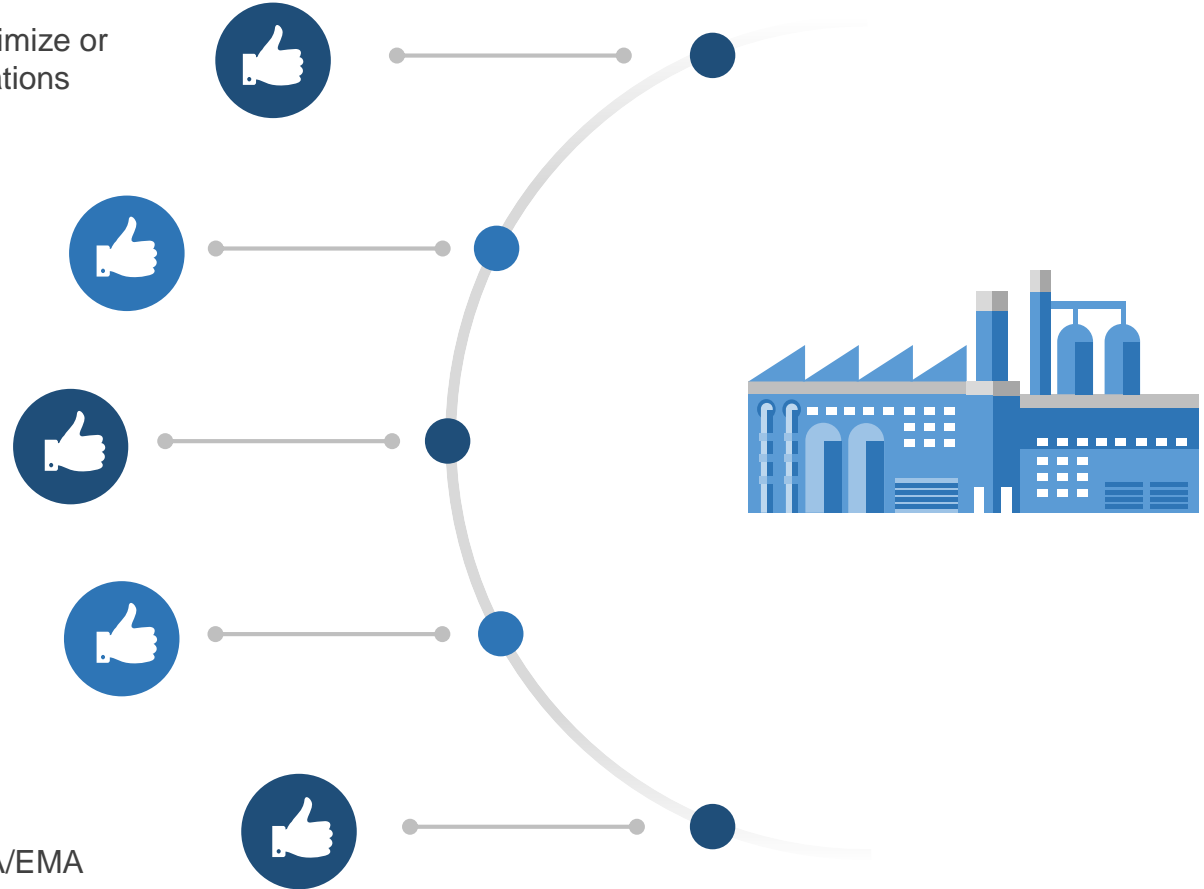
Front-End Engineering Design - process & plant design (from batch to continuous) – process optimization

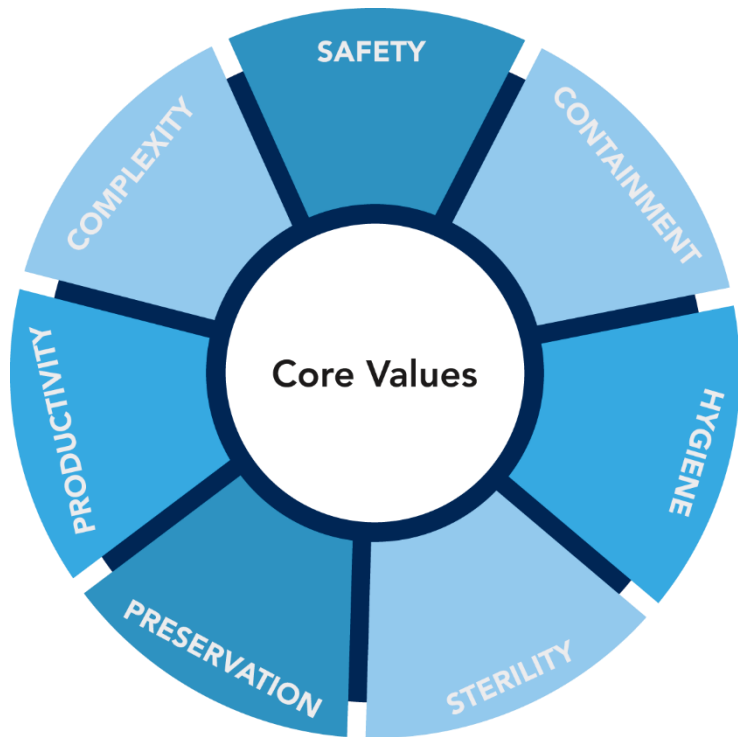
## Engineering Capabilities

Mechanical engineering – process design – electrical design – Computational Fluid Dynamics (CFD)

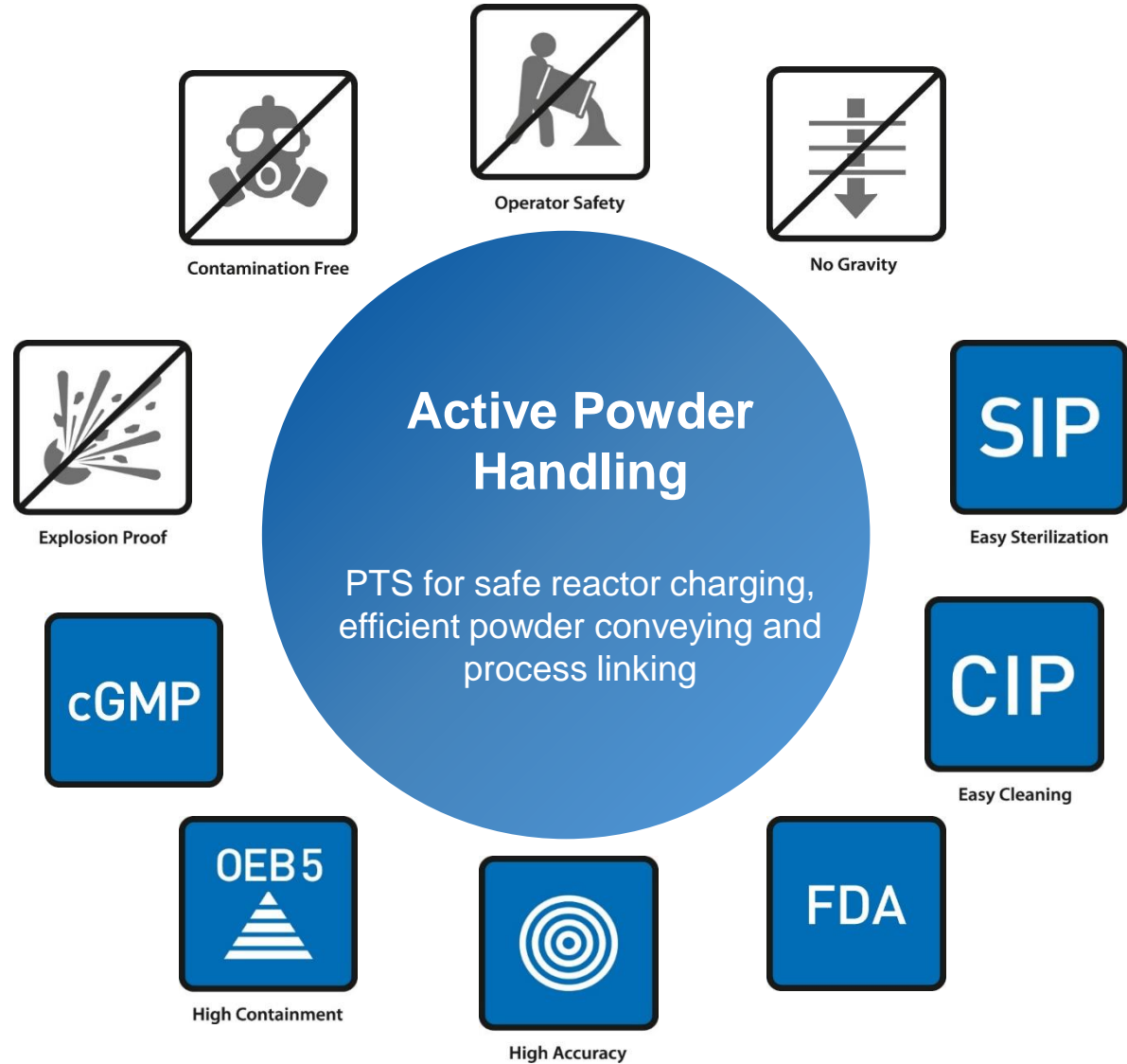
## Regulatory Compliance

GMP reviews – REACH – FDA/EMA





Keyword	Description	Example
<b>Safety</b>	Prevention of explosion	Charging powder into reactors containing solvents
<b>Containment</b>	Operator protection	Dispensing high potent APIs in the pharmaceutical industry
<b>Hygiene</b>	Avoiding cross contamination by offering high cleaning abilities	Handling powders in multi-purpose operation
<b>Sterility</b>	Guaranteeing product integrity	Packing powder under sterile conditions
<b>Preservation</b>	No changes of product characteristics	Transferring powder without segregation or particles damage
<b>Productivity</b>	Increasing efficiency by process linking	Upgrading plant design from batch to semi-continuous process
<b>Complexity</b>	Solving complex requirements	Dosing powder at mg level with high accuracy





# Key Technologies - DCS® Drum Containment System



Dec sets new standards to empty with its closed and contamination free DCS® Drum Containment System – perfectly designed to work in combination with the PTS



High Containment



Explosion Proof



No Gravity



Operator Safety



Contamination Free

**Isocharge is ...**  
the first technology combining  
the advantages of isolation and  
laminar flow technology,  
providing a high containment  
solution for fast dispensing and  
charging powders into any  
process



High Containment



Contamination Free

## Key Technologies - High Containment Pack-Off Station

With the launch of this high containment conveying, dosing and packing system, clean rooms are no longer required



High Containment



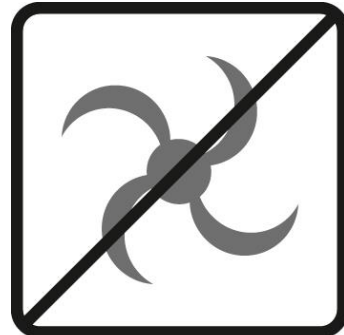
Contamination Free



# Key Technologies - PTS Batchmixer®



Dec brings an innovative powder blending solution to the industry. First mixer without moving or rotating parts.



No Rotating Parts



PTS Batchmixer® on top of a process isolator



Enhanced Performance



High Containment



Easy Cleaning



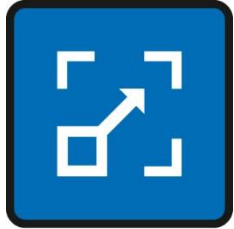
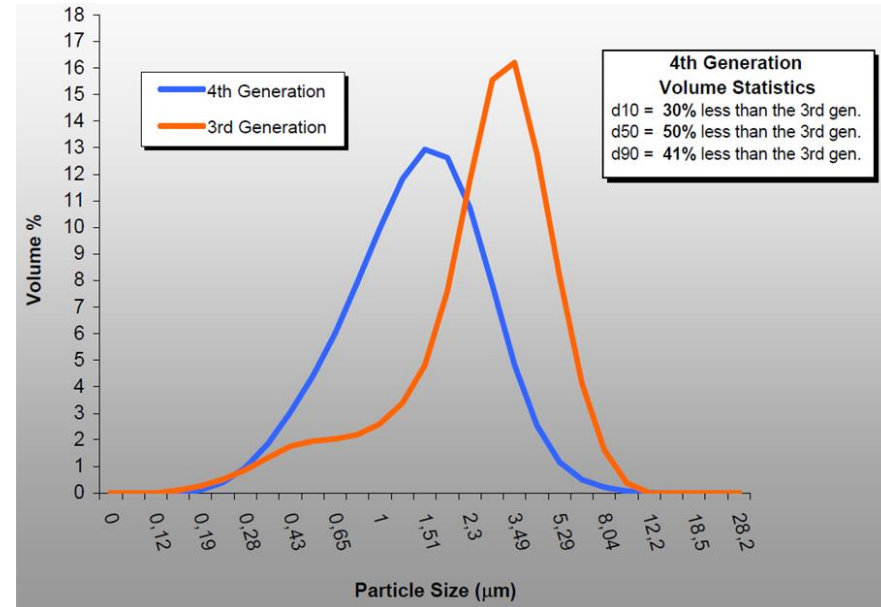
Easy Sterilization

Patented technology

True End-to-End Solutions



Our 4<sup>th</sup> generation jet mills achieve outstanding micronizing results in terms of particle size and PSD (Particle Size Distribution)



Easy Scale up



Narrow PSD



Enhanced Performance



Sanitary Standards





## Key Technologies - Isolator Technology

Aseptic Processing & Filling - Process Containment – Nuclear Containment – Cell & Gene Therapy



High Containment



Easy Cleaning



Easy Sterilization

True End-to-End Solutions



## Downflow Booths

- Stainless steel or epoxy – coated mild steel construction
- High efficiency EC fan system
- Safe change filters
- Overhead lighting within supply plenum

## Mobile Clean Rooms

- Standard and extended widths available
- Pre-engineered, self-contained, single piece construction ready to use
- Fast and Flexible

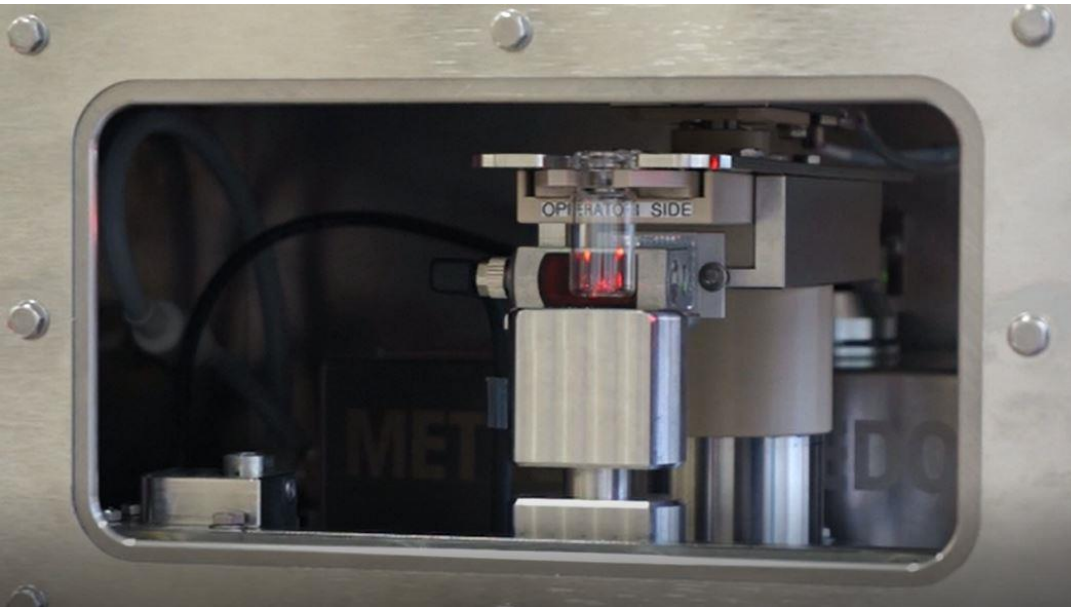
## Workbenches

- Air cleanliness classification: ISO Class 5 at rest
- Effective product control from spraying/mixing and other small volume operations
- Dust in Air Level - Operator Exposure Level (OEL) 10  $\mu\text{g}/\text{m}^3$

## Nuclear Containment

- Capable of meeting (10-6 cc/sec) at 4 inch water column leak rate
- (AGS-G006-2017), Second Edition

Volumetric dosing of small quantities (mg to g range) allowing for a rapid dosing process compared to conventional gravimetric systems



μPTS : Dosing range 1–500 mg (powder)



flexPTS for powder dosing (powder)



Interphex Award winning BoMa Technology (liquids)



High Accuracy



Time Saving



Easy Cleaning



# Key Technologies- DecFill® Aseptic Filling Lines

DecFill® - LAB <i>Laboratory</i>	DecFill® - MB <i>Micro Batch</i>	DecFill® - SB <i>Small Batch</i>	DecFill® - PS <i>Fully Automated Modular Production Scale</i>
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Nestled / RTU



Dual Chamber



Pre-filled syringes



Bottles



Vials



Cartridges



Pouches



Sachets



Flexible and customizable solutions to improve efficiency



GMP Annex 1 compliant

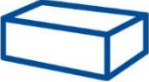




True End-to-End Solutions

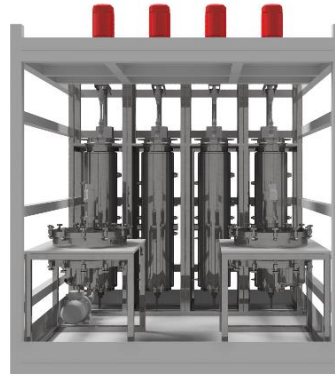


Item **Serialization Units (ISU)**



Case **Serialization Units (CSU)**

Item	Bundle	Case	Pallet	Expertise
				
Print, inspect, reject, apply, temper evidence, top labeller	Item to bundle, aggregate, print, inspect, reject	Print, inspect, apply, aggregate items or bundles, (de) commission	Print, inspect, apply, reject, aggregate to pallet, (de) commission	<ul style="list-style-type: none"> <li>✓ Certified PE</li> <li>✓ Certified FE</li> <li>✓ Dec Engineers</li> </ul>



LAB

Pilot

Production

## Flow Chemistry

- Continuous reactors & crystallizers
- Continuous filtration & drying systems
- Intervessel transfer & dosing solutions



## The NEW Plug flow reactor



## Thermal Solutions

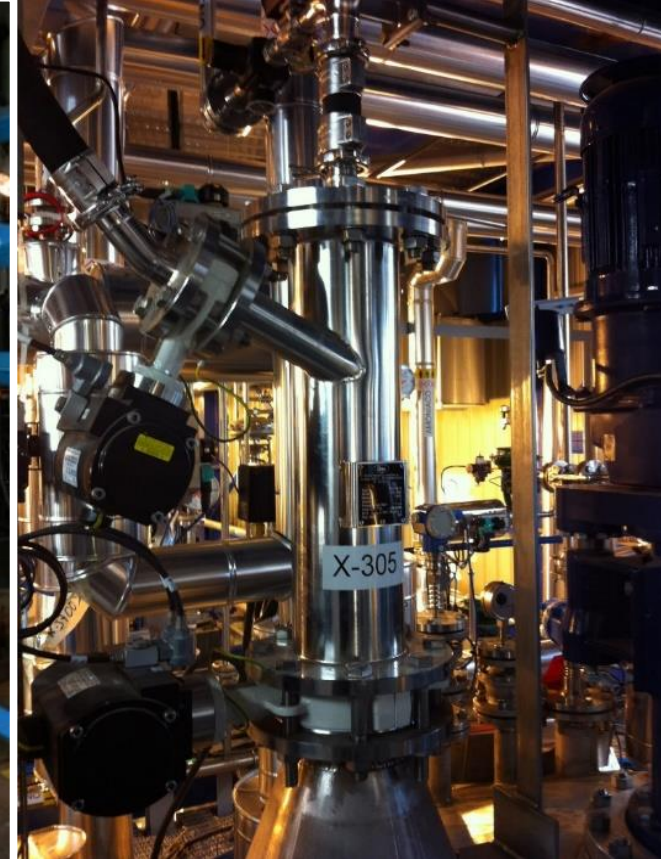
- Electric & liquid heated transfer lines
- Temperature controllers & heat exchangers
- Unique Plug Flow Reactor solutions

## Engineered Solutions - Reactor Charging with Toxic and Highly Corrosive Powder

Contained charging of cyanuric chloride  
from **big bags** into a chemical reactor with a PTS



Big bag station with DCS® Docking System



PTS in Hastelloy on reactor



Sack cabinet and Isocharge for bag discharge



PTS on reactor with multiple entry

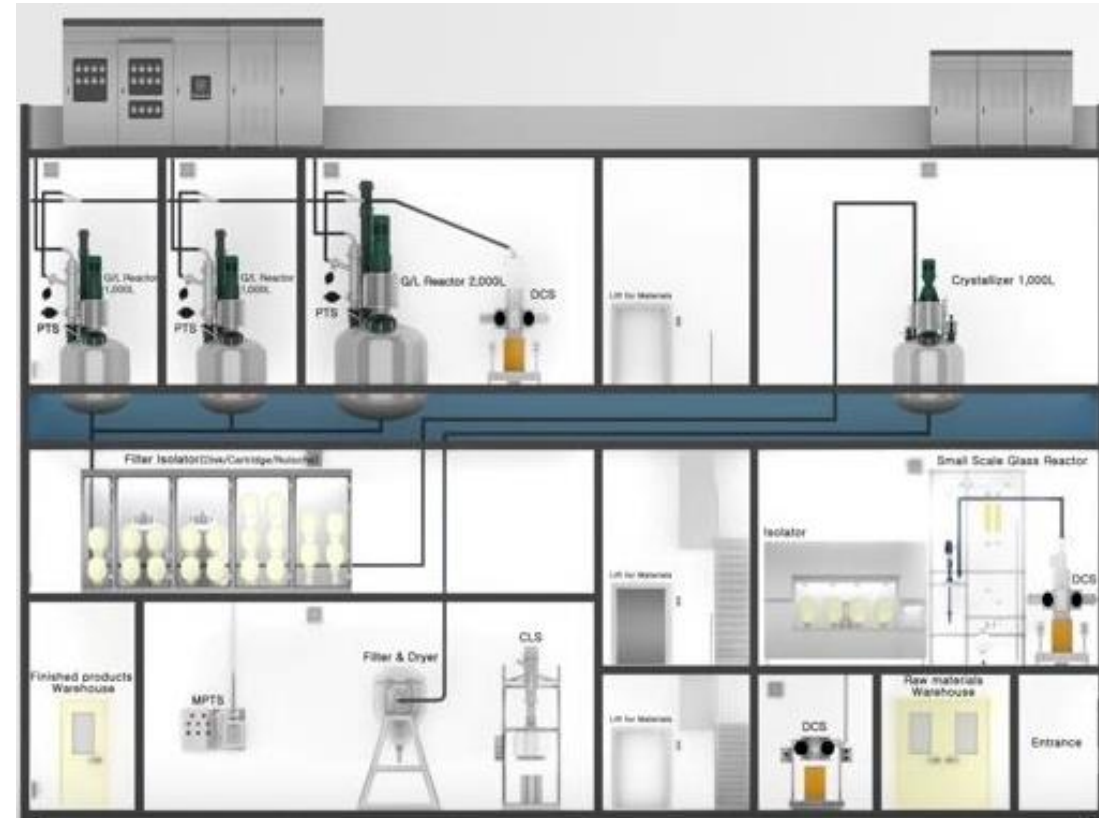
Safe multiple reactor charging solution for toxic and non toxic powders out of bags - high capacity over 3 tons/hour



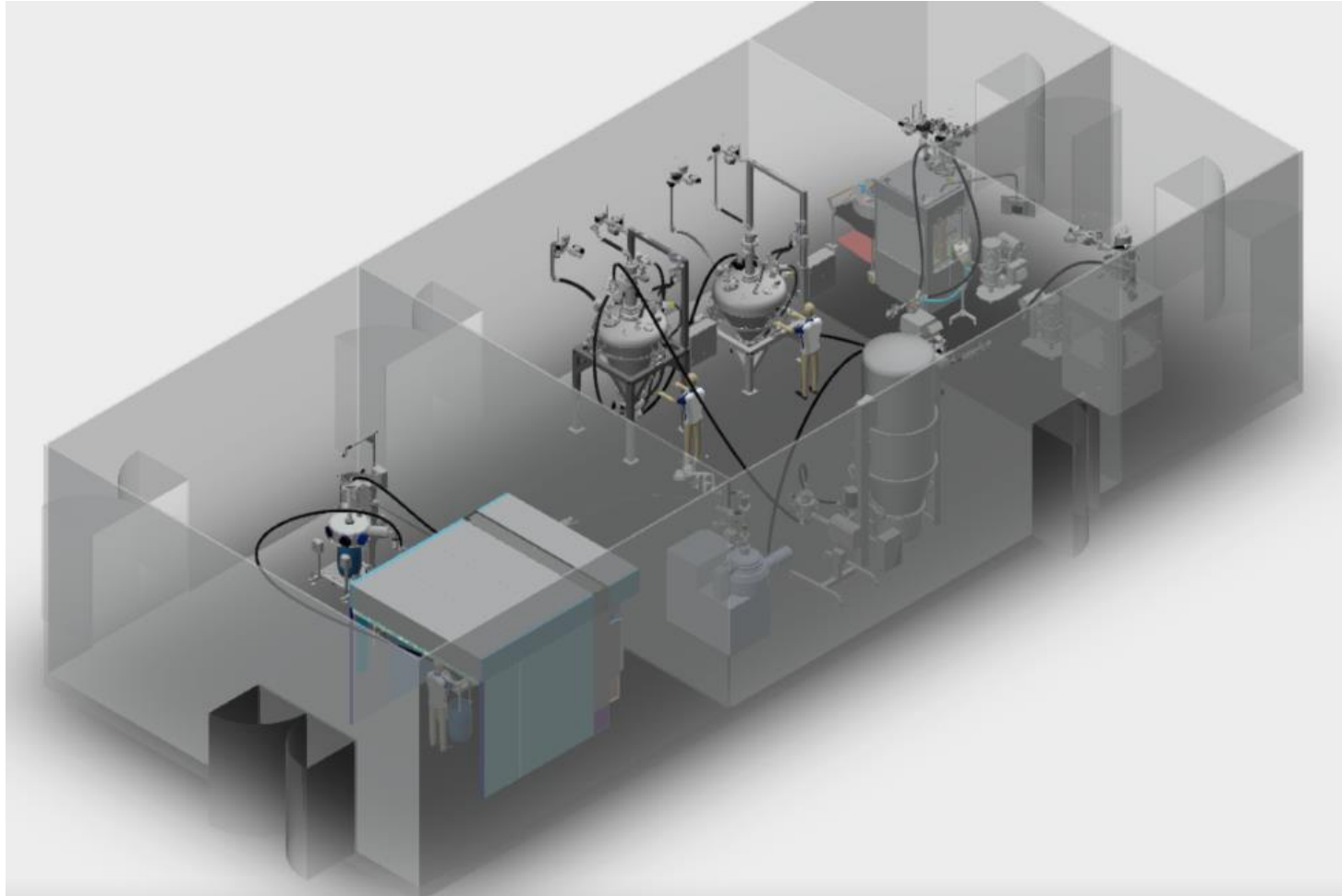


- Containment performance  $< 5 \text{ ng/m}^3$  (OEB 6)
- Twin chamber system with double endless liner
- Fully integrated pilot scale filter dryer
- Meets class ISO-7 inside





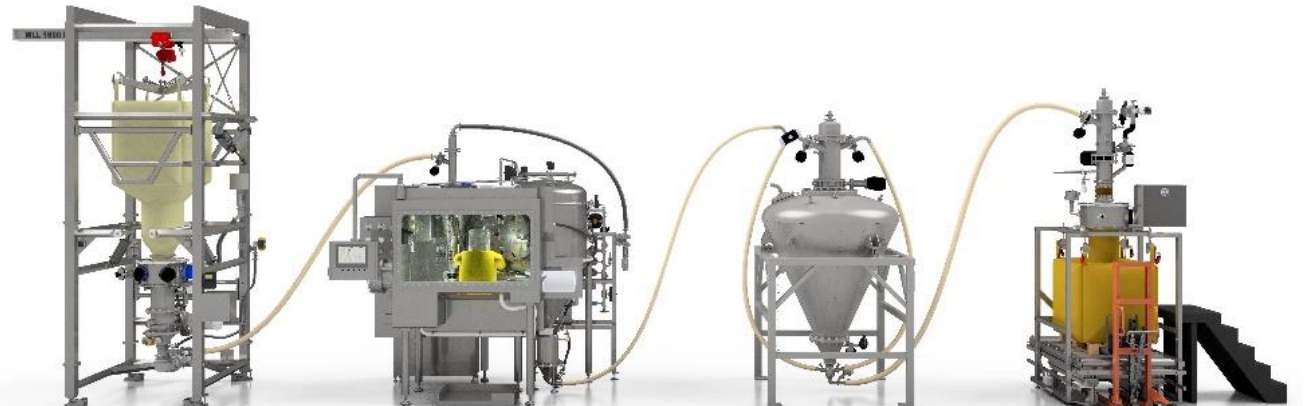
- Antibiotics and cytotoxic APIs, flexibly adaptable to different batch sizes
- From raw material sampling, feeding reactors to final packaging



- Contained dispensing
- Multiple process stream
- Integrated granulation line
- Direct compression
- Tablet press and capsule filling



- Multiple reactor charging from big-bags, drums and bags
- Filter dryer discharge and filling into continuous liners or big-bags
- Contained micronization from FIBCs
- Contained blending with PTS Batchmixer®
- Contained pack-off with CLS Continuous Liner System or into big-bags





- Contained dispensing of sterile powder in bags within an isolator
- Bag decontamination with VHP
- Aseptic powder transfer by PTS Powder Transfer System® into vessel
- Full CIP/SIP sequence



Dispensing and milling isolator

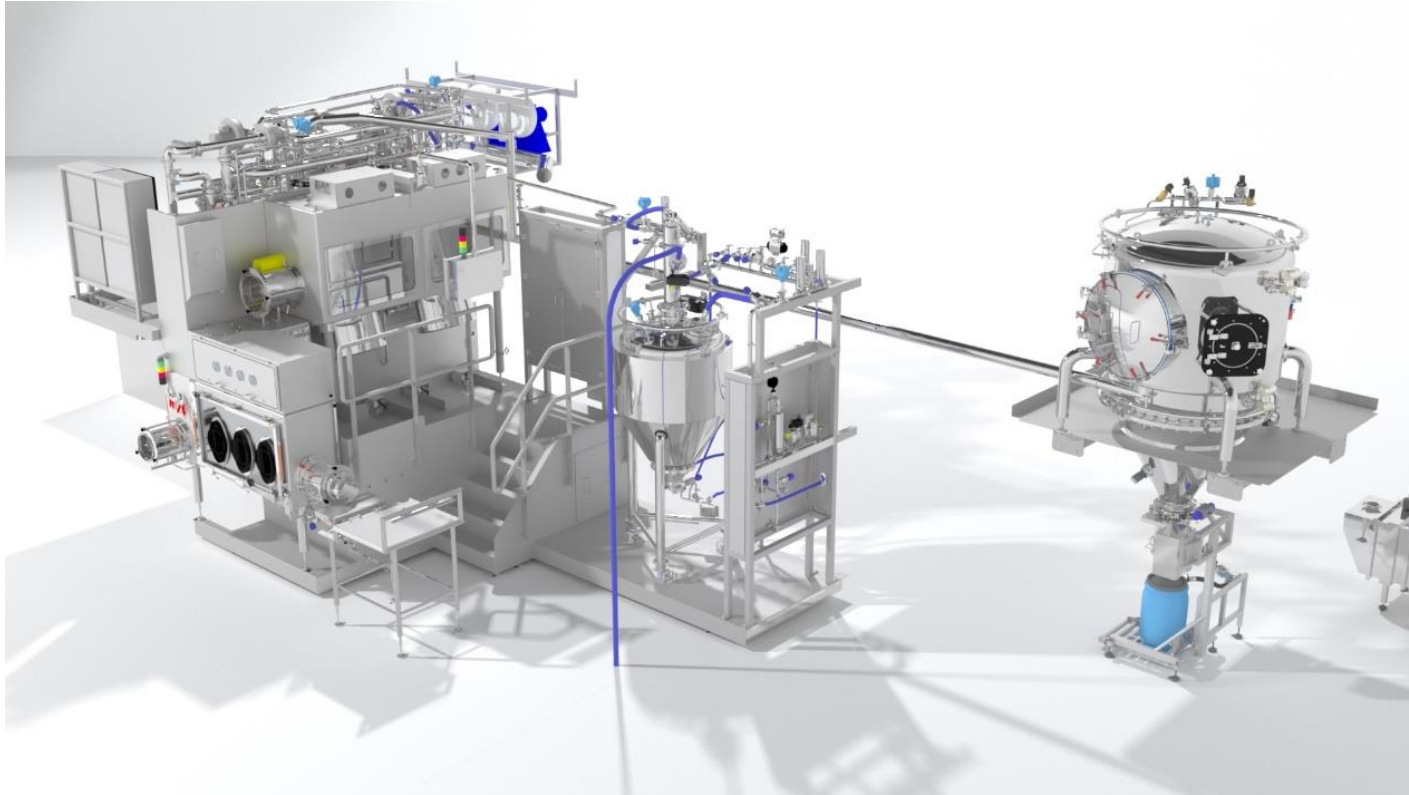


PTS Batchmixer® above tablet press



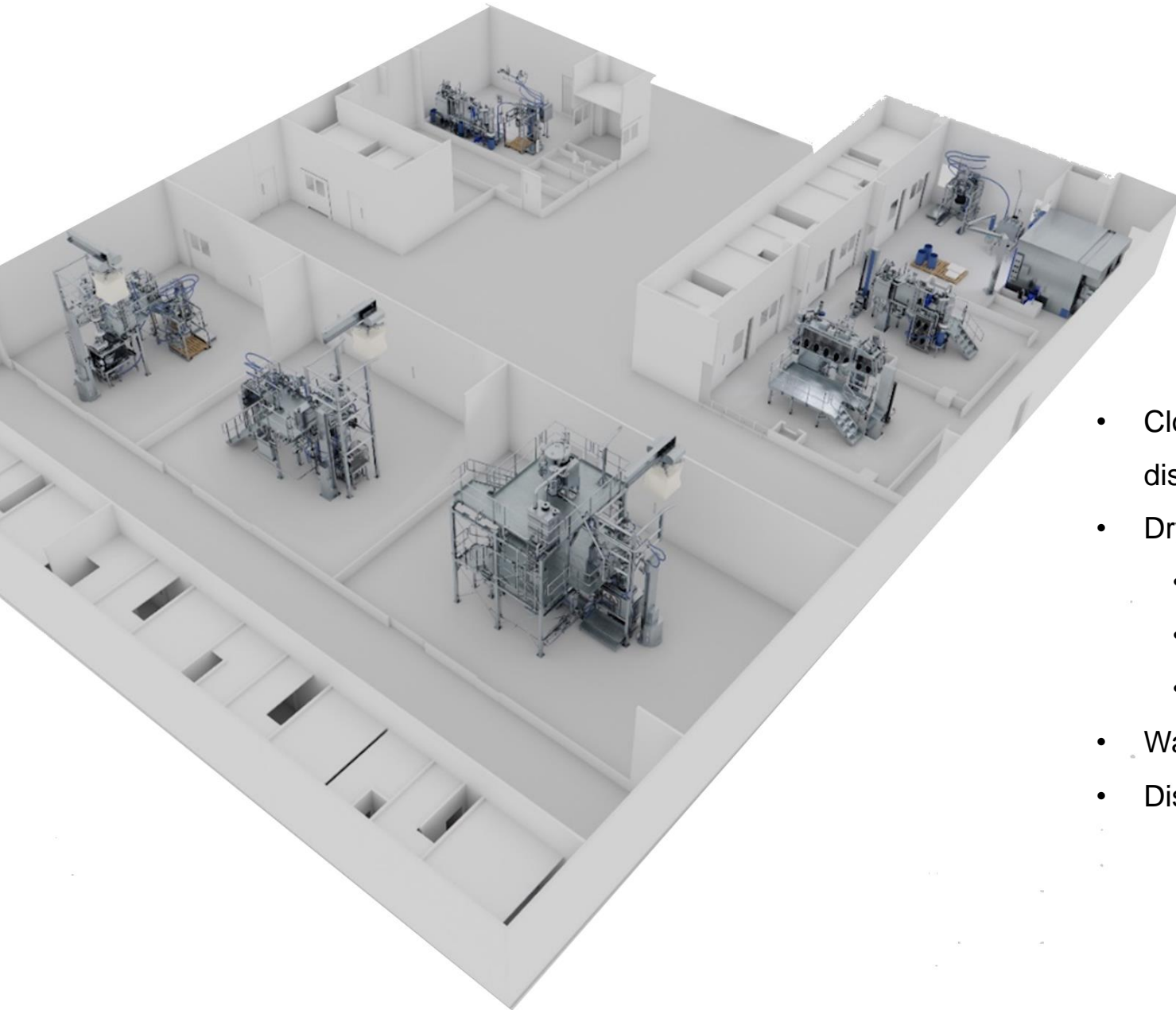
- High containment dispensing & pre-blending isolator
- Laminar Air Flow (LAF) large scale dispensing & sieving





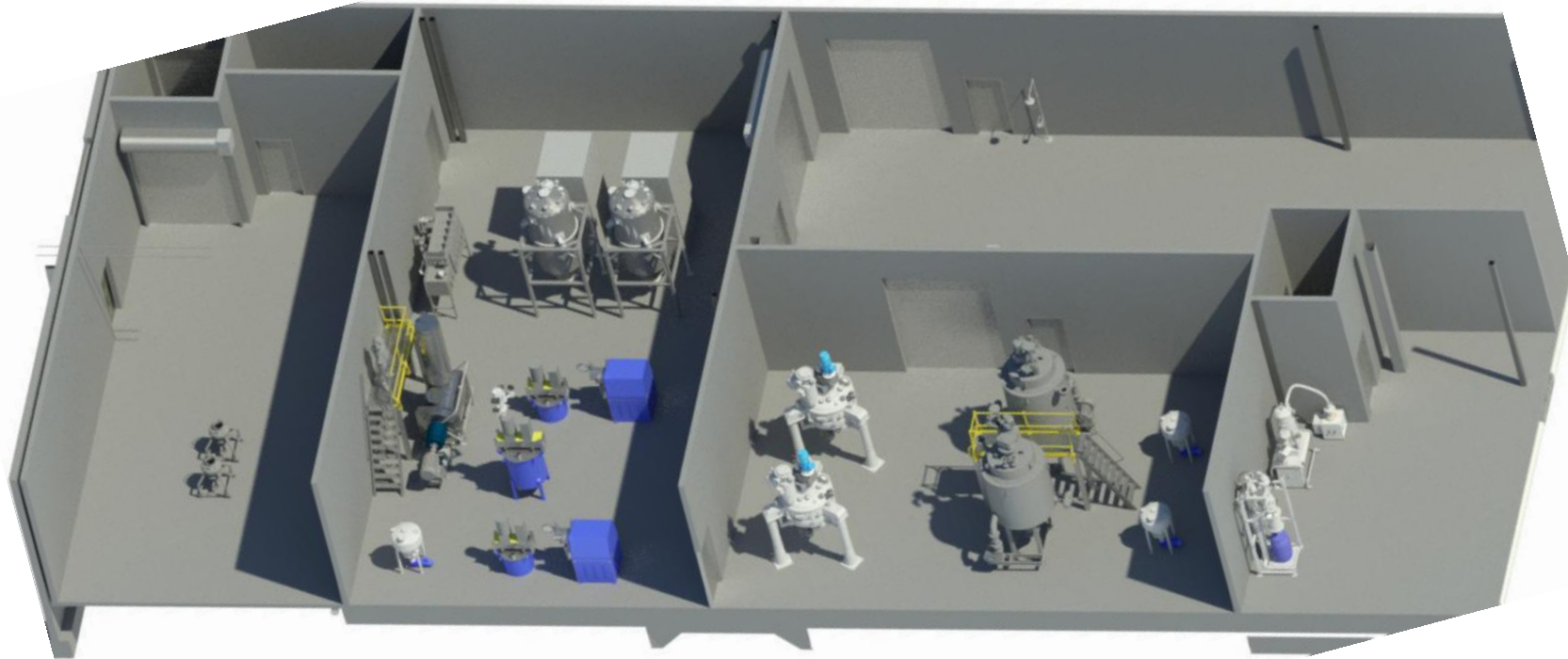
Complete sterile/toxic plant from dryer tray discharge, transfer by PTS, micronizing and final packing into liners





- Closed powder handling from reactors charging to dryer discharge
- Dry processing area
  - Jetmilling, sieving and packing
  - Hammermilling, sieving and packing
  - Sieving and final packing
- Washing Isolator for all parts
- Dispensing area for various product packaging and toxicities

- Contained battery powder dispensing
- Drying
- Micronization
- Pack-off operation

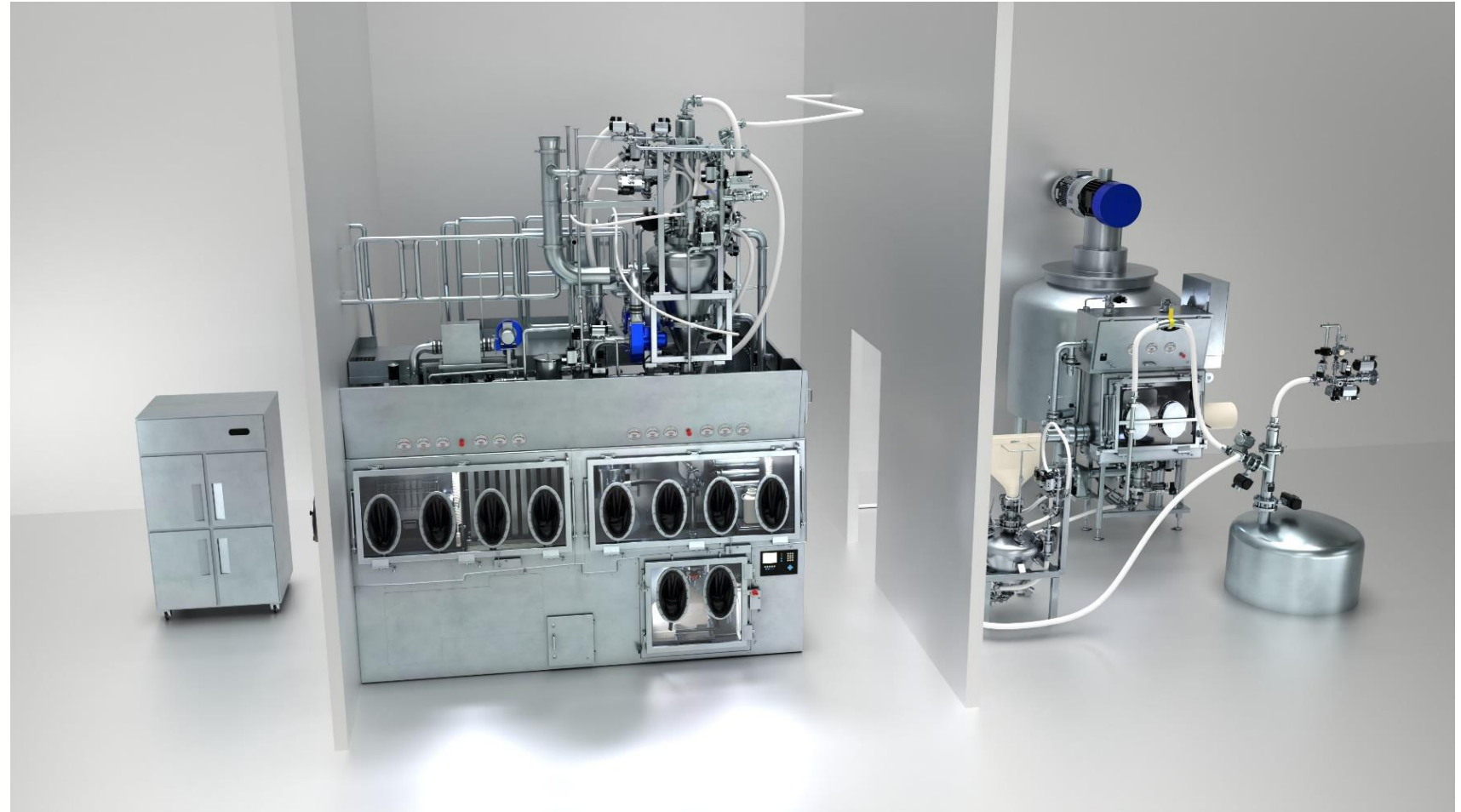


## 2 – Stage Process

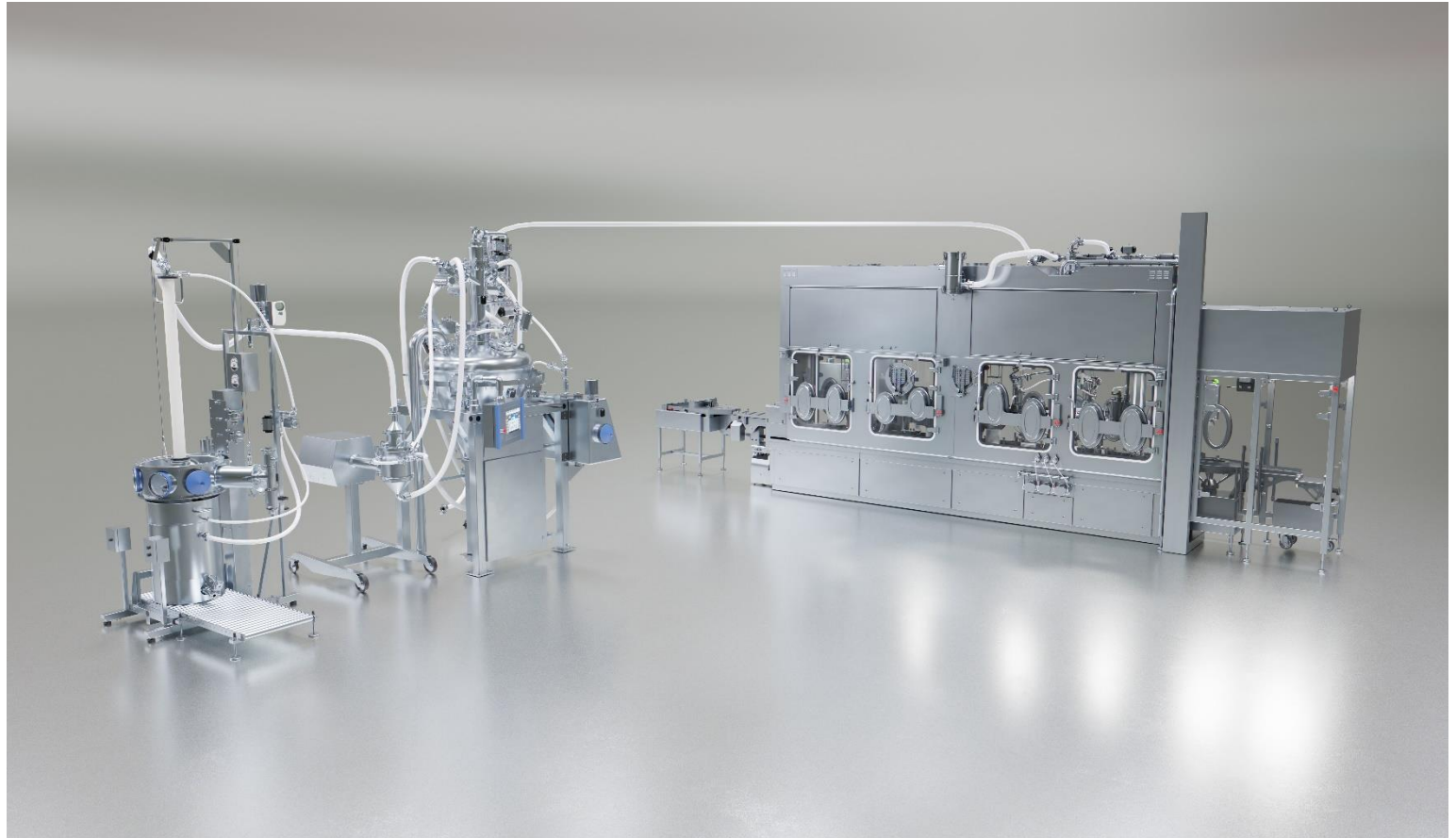
- Tray dryer - Milling – Blending – Packing
- Reactor charging – Filter dryer discharge – Equalizing - Blending – packing
- OEL < 0.4 µg/m<sup>3</sup>

## Multipurpose Isolator

- Tray discharge
- Blending with integrated PTS Batchmixer<sup>®</sup>
- Milling
- Tray loading
- Accurate dispensing in single use bags and bottles



- Contained drum discharge with DCS Drum Containment System®
- Sieving / Milling process
- Blending operation with PTS Batchmixer®
- Powder and liquid filling into vials



- High containment HPAPI Micronization plant for OEB 7 products ( $< 25 \text{ ng/m}^3$ )
- Mezzanine floor & integrated drum lift
- Fully integrated charging, micronization & packing into drums
- Fully developed CIP skid 2 detergents

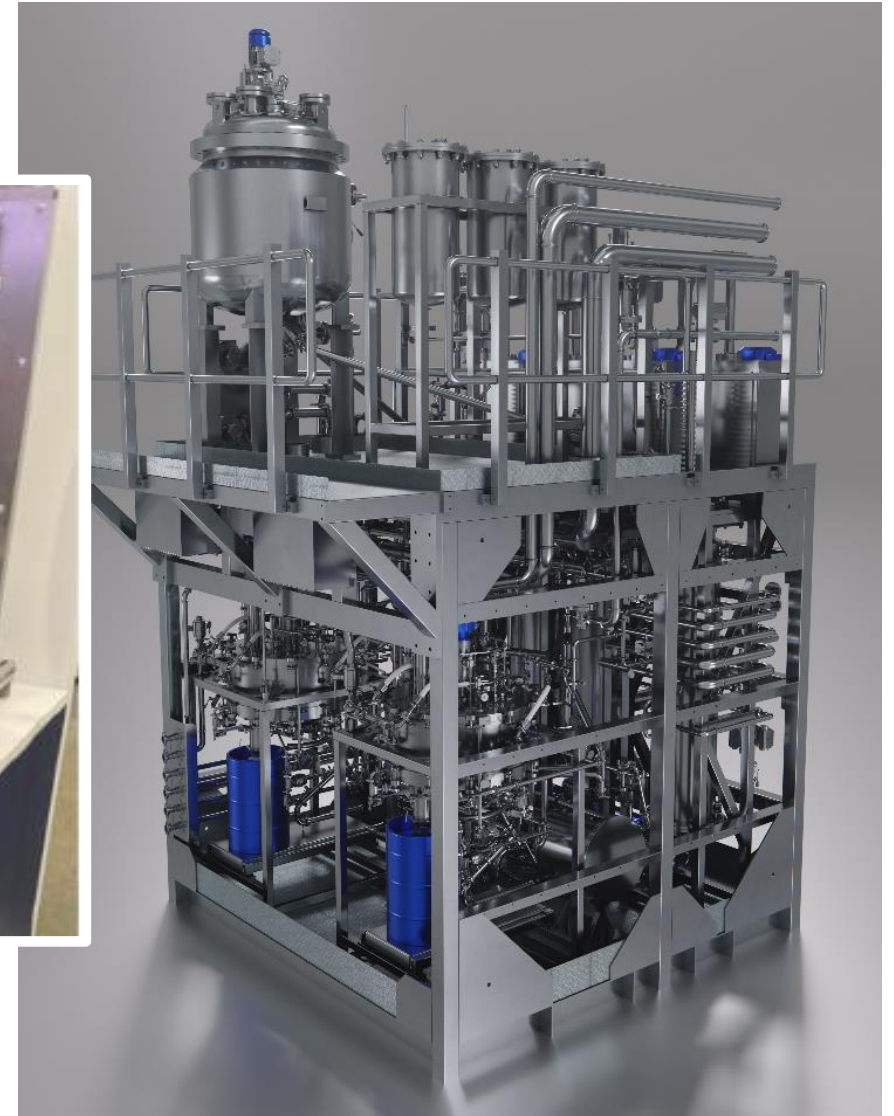




Groundbreaking Science Driven Technology



Continuous reaction, crystallization and filter-drying, from lab to production scale





[dec-group.net](http://dec-group.net)

