



# Energizing pharma

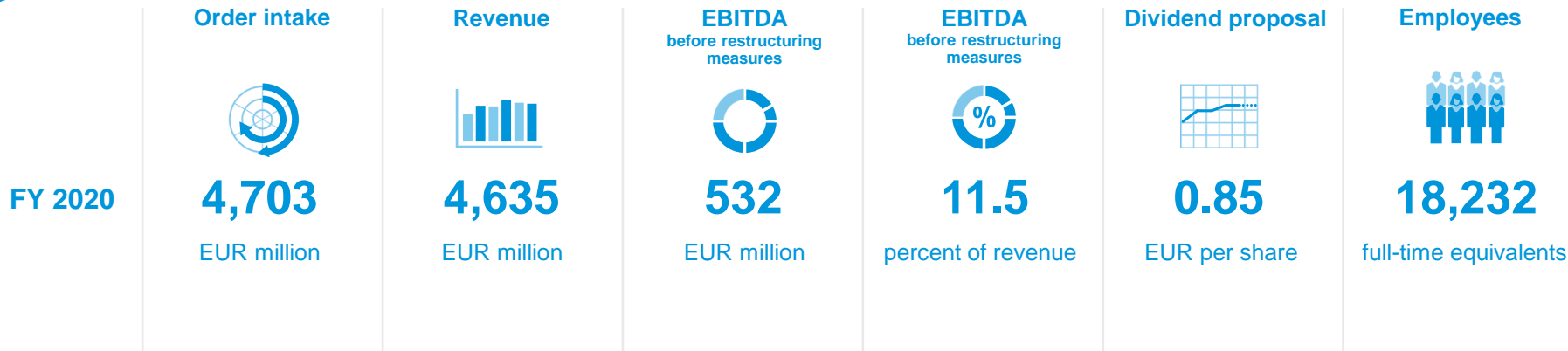
Efficient and secure:  
**Vaccine Production with  
GEA pharma separators**

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CHEMICAL & PHARMA

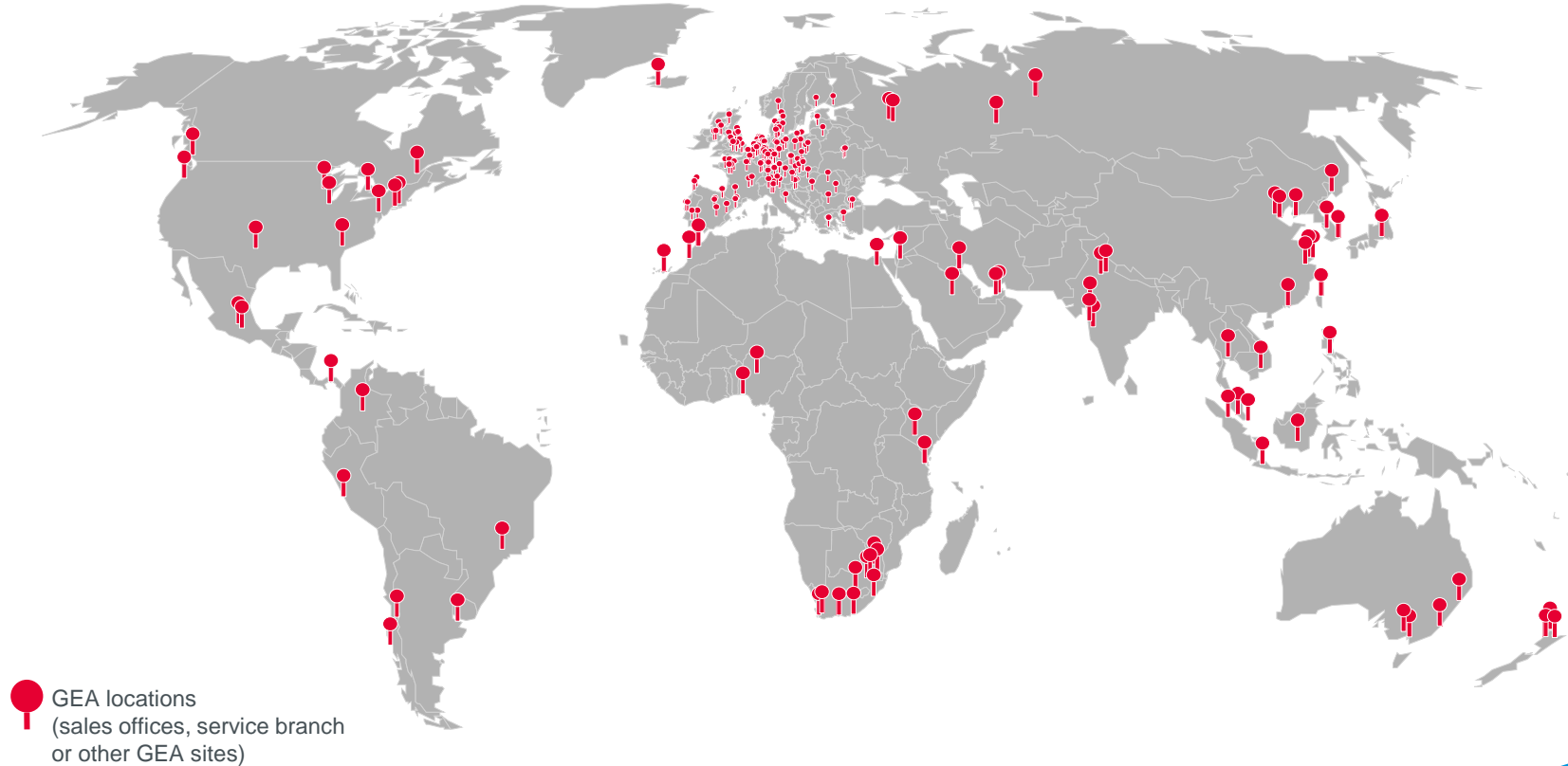
# GEA at a Glance

"GEA is one of the world's largest systems suppliers for the food, beverage and pharmaceutical sectors. A major focus is on continuously enhancing the sustainability and efficiency of customers' production processes. GEA plants, processes and components help achieve significant reductions in carbon emissions, plastic use and food waste in production worldwide. In this way, GEA makes a decisive contribution toward a sustainable future, fully in line with its corporate philosophy of "engineering for a better world."

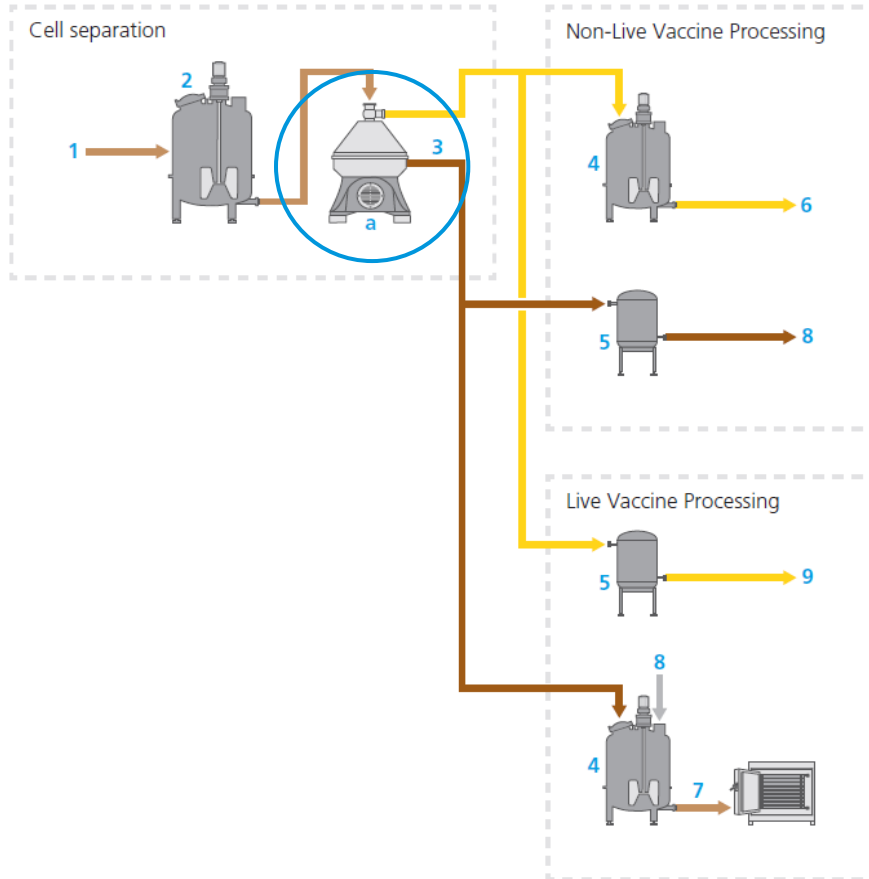
GEA is listed on the German MDAX and the STOXX® Europe 600 Index and also included in the DAX 50 ESG and MSCI Global Sustainability indexes.



# Local presence worldwide



# Separation solutions in human vaccines



## Non-Live vaccines

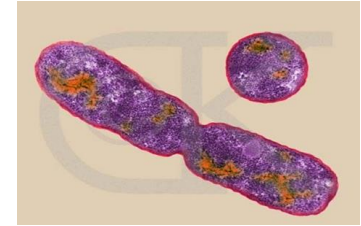
- Influenza
- Cholera
- Bubonic plague
- Hepatitis A or hepatitis B
- Whooping cough (pertussis)
- Tetanus
- Diphtheria
- Pneumococcal bug

## Live vaccines

- Measles
- Mumps
- Rubella
- Yellow fever
- Chickenpox
- BCG (= tuberculosis vaccine)
- Typhus
- Human rotaviruses
- Whooping cough (pertussis)

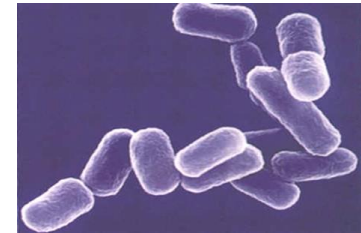
## Culture media

⇒ Valuable phase



## Culture media

⇒ Waste



# The new GEA Pharma separator lines aseptic & pure



engineering for  
a better world

## GEA Pharma Separator aseptic



## GEA Pharma Separator pure



2 full separator lines

ASME BPE compliant design

Utmost variability (flexibility)

Integrated Direct Drive concept

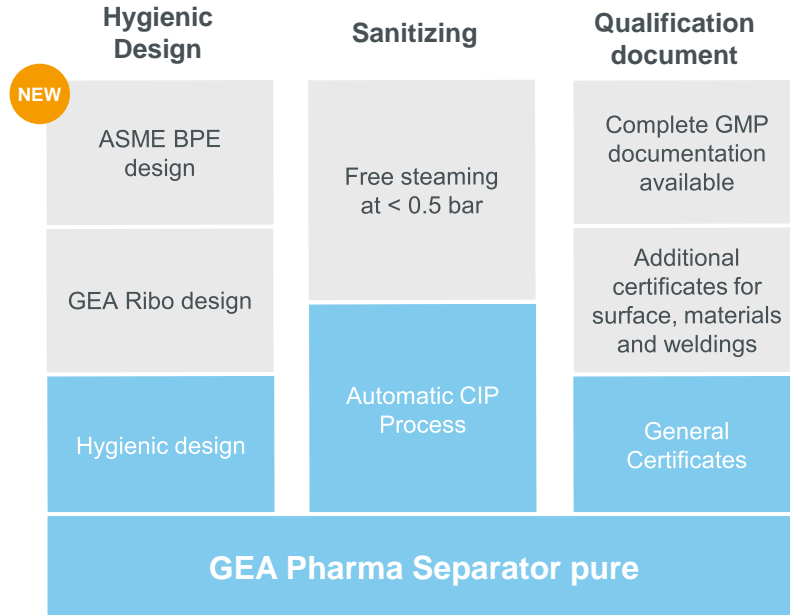
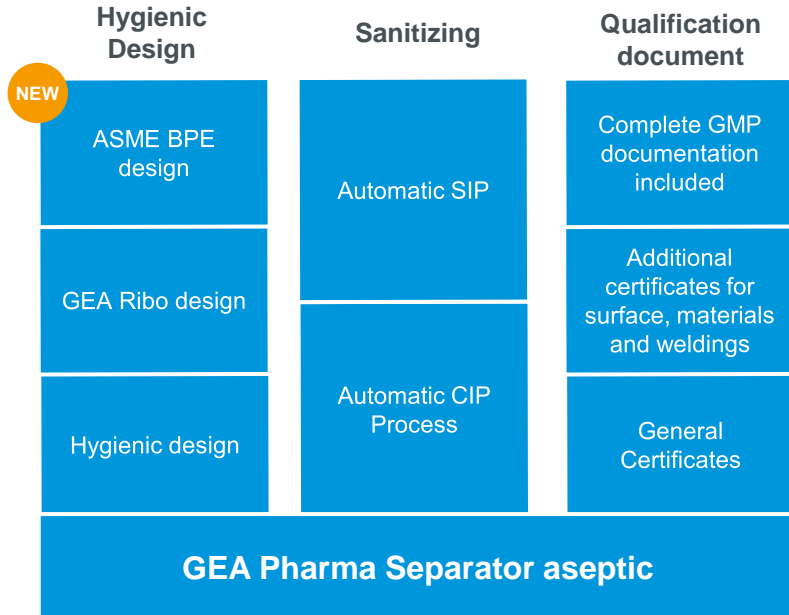
Multifunctional machine by  
GEA flexChange concept

Optimized Bowl concept  
including the  
NEW GEA flexicon nozzle  
separator

Skid configurator

# Selection process (Customer requirements)

Cleanability, surface texture and documentation always adaptable to your needs



Included



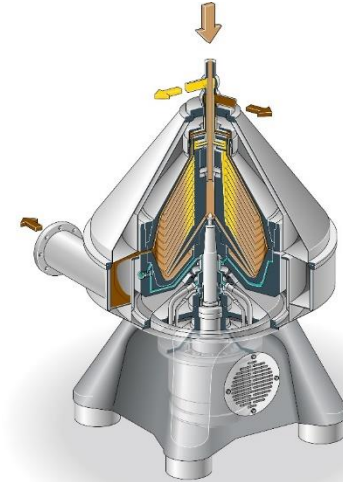
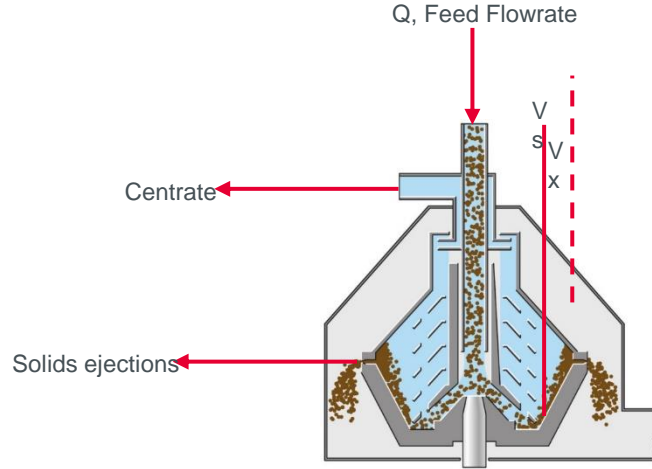
Adaption options

Let's get into technical details



# Maximum yield thanks to high precision desluding

GEA self-desludging centrifuges



## Typical feed conditions in vaccine productions:

3-5 % solids in volume, depending on vaccine

30 -1000 l/h, up to 7000 l/h possible for larger machines

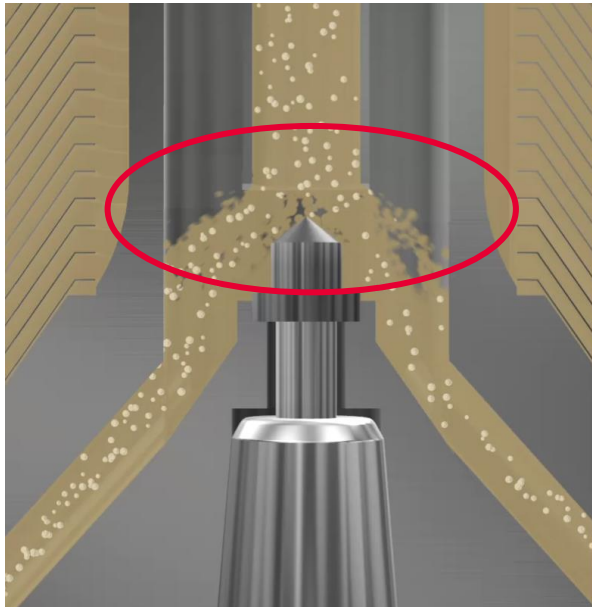


# Gentle product handling, higher viability of cells, more efficient clarification

## Hydrohermetic Feed patented by GEA Westfalia Separator Group

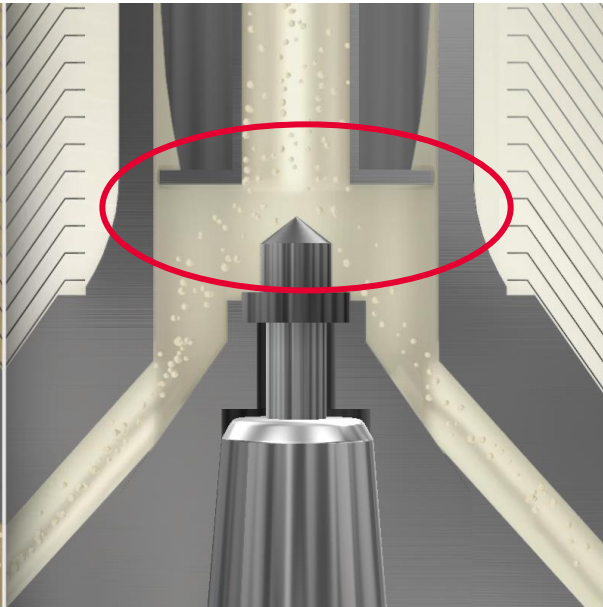
Common Feed

Product accelerated freely



Hydrohermetic Feed –

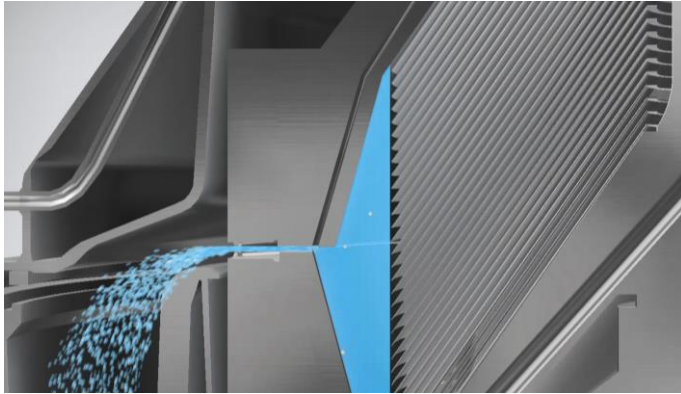
Product accelerated within the liquid, underneath the disk



No turbulences,  
no splashes,  
no shear forces

# Cleanability – CIP and SIP

Total bowl ejections –  
possible with hydrohermetic feed system



Spray Nozzles



Steam Sterilization

# The next level of pharmaceutical cleanability: Patented gap-free welded disc spacers

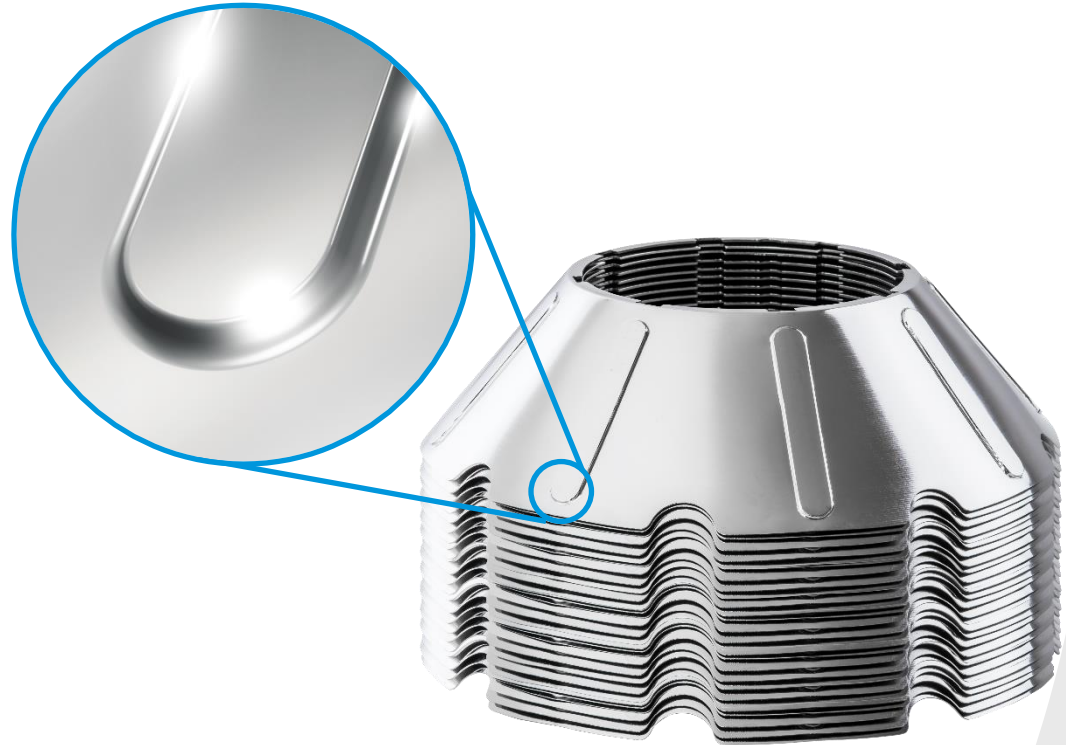
GEA's **patented laser-welded** disk spacers lead you to the next level of pharmaceutical cleanability.

## **Perfectly clean:**

### **High quality laser-welded spacers**

Maximum welding precision leaves no dead spaces in the disk stack, providing the basis for a highly effective CIP and SIP cleaning.

Optionally available for GEA pharma separator pure.



# Unique: GEA Pharma test bay for pre-qualification



**Pre-qualification  
of separator  
centrifuge skids**

Flexibly and safely  
on the GEA pharma  
test bay.

Sold 172 package units



Until  
2021

>50 customers



**EVOL  
UTION  
NOW**

## Single-use GEA kytero® Separator

All our competence –  
in an easy-to-operate  
single use skid



## GEA kytero® Separator: 1 new design – 3 × benefits for you



Easy and time-saving  
operating concept

Maximum-purity  
GEA breezeDrive®  
revolution

Proven high-yield  
disk stack technology





# I am happy to answer your questions:



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