

GEA KYTERO SEPARATOR

Revolutionary single use centrifuge for cell
harvesting in pharmaceutical downstream
processing

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USA

GEA at a glance

Order intake



5,222

EUR million
Previous year: EUR 4,703 million

Revenue



4,703

EUR million
Previous year: EUR 4,635 million

EBITDA before restructuring measures



625

EUR million
Previous year: EUR 532 million

EBITDA margin before restructuring measures



13.3

percent of revenue
Previous year: 11.5 percent

Dividend proposal



0.90

EUR per share
Previous year: EUR 0.85

Employees



18,143

Full-time equivalents
Previous year: 18,232



GEA is one of the world's largest suppliers of systems and components to the food, beverage and pharmaceutical industries. The international technology group, founded in 1881, focuses on machinery and plants, as well as advanced process technology, components and comprehensive services.

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

Our applications put consumers in touch with GEA every day



Food

Approx. every third chicken nugget is produced using GEA technology



Food

Approx. every third process line for instant coffee was installed by GEA



Dairy farming & processing

Roughly one quarter of processed milk comes from GEA production systems



Beverage

Approx. every second liter of beer is brewed with the aid of systems and process solutions from GEA



Pharma & healthcare

Roughly every fourth liter of human blood for making plasma-derived products is processed using GEA equipment



Chemical

More than one third of all polymer producers are using GEA drying technology



Environment

Approx. two million tons of pollutants are averted annually thanks to GEA emission control plants



Heating & refrigeration

Each industry we serve utilizes industrial heating and refrigeration technology from GEA

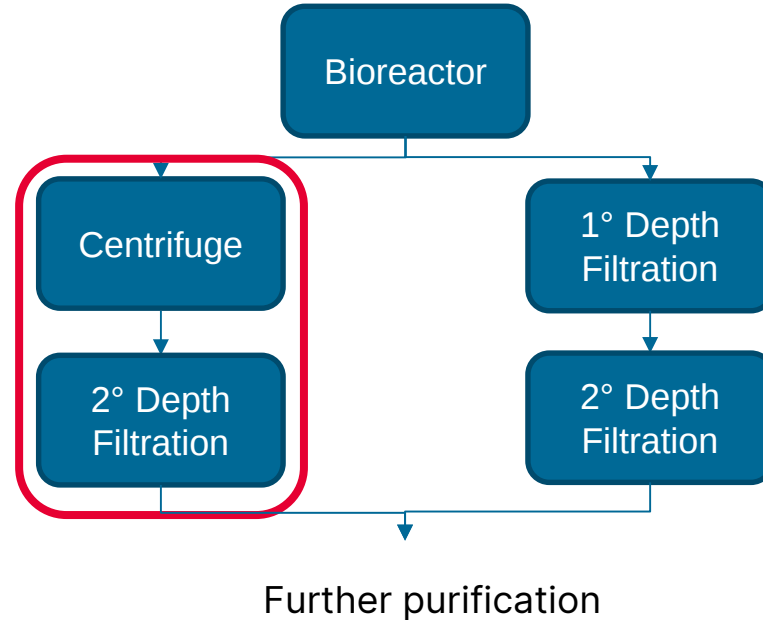


Marine

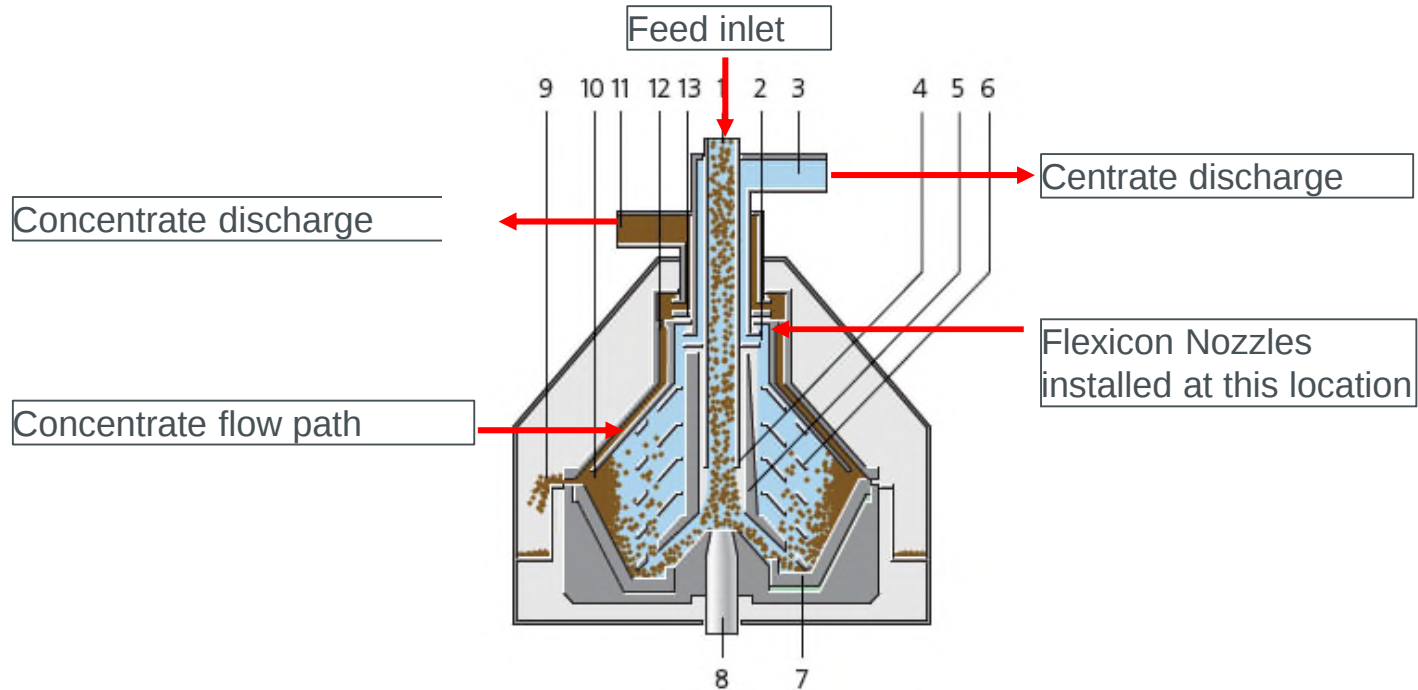
Roughly every second container ship in the world sails with GEA marine equipment on board



Typical flowsheet for harvesting mammalian cells or ecoli



GEA Separator: Continuous Solids Discharge



GEA kytero® 500 and 2000

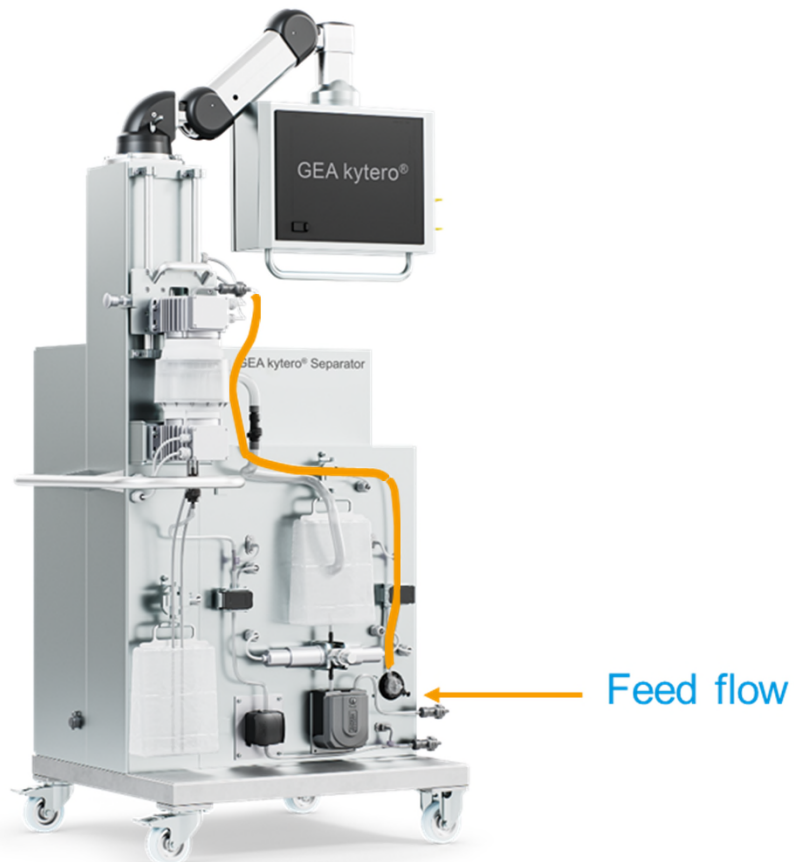
- Single-use pathway and Bowl cartridge
 - 100% closed system
 - Installation to start up in ~5min
- Small footprint
 - 500 is 0.95m x 0.8m x 1.8m
 - 2000 is .95 m x 1.2 m x 1.9 m
- Single phase 120V supply
- Comparable performance to stainless steel disk stack centrifuges
- No buffer or cooling requirements



GEA Single Use Separator



Kyero Production

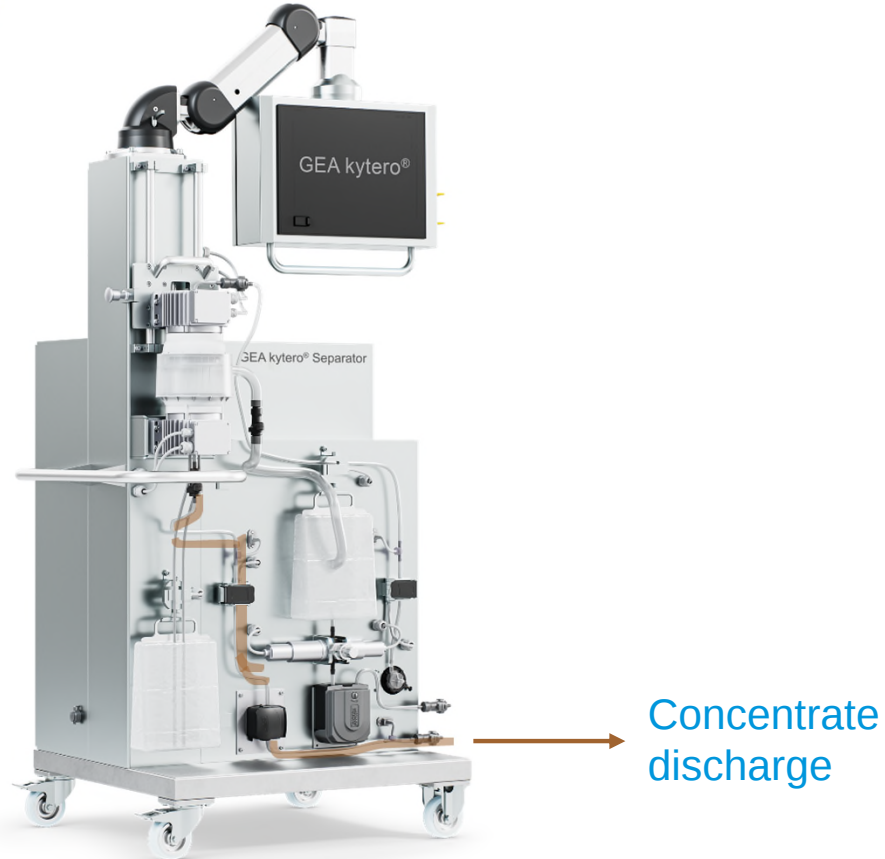


Centrate flow path



The process flow

Concentrate discharge



Performance and Yield

High Performance

Yield

- ✓ Design based upon proven disc stack technology
- ✓ Superior results on mammalian cells and bacteria fermentations (gene therapy)
- ✓ Excellent clarification with 99% solids removal rate
- ✓ Gentle product handling, low shear forces, high viability of discharging cells
- ✓ 0% increase in LDH with cell viabilities >60%
- ✓ At least 2/3rd reduction in depth filtration requirements (= \$)
- ✓ High adjustable solids concentration – up to 98% PCV
- ✓ Excellent results with high density cultures

Quality

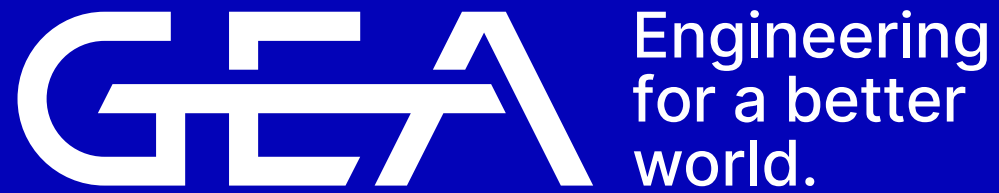
Product **Safety**

- ✓ Process wetted materials per BPOG protocols
- ✓ USP Class VI and ADI free components
- ✓ Gamma irradiation (available)
- ✓ 100% closed system
- ✓ Zero risk of carbon / plastic debris contaminating the product
- ✓ Low pressure operation with simple monitoring

Customer comments

Robust
&
Simple

- ✓ No water required
- ✓ No buffer required
- ✓ No coolant required
- ✓ Only utility needed is power = 120 V
- ✓ Simple exchange of the single use parts (5 – 10 mins) - no tools
- ✓ Light weight bowl assembly
- ✓ Compact Footprint :
- ✓ Less plastic for disposal
- ✓ Very quiet operation
- ✓ Low pressure operation



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