

PROREACT BIOREACTORS FOR INDUSTRIAL APPLICATIONS



LARGE SCALE BIOREACTORS



For the Production of:

- Biomass and starter cultures
- Organic acids
- Food ingredients and savory flavors
- Enzymes and other proteins
- Fine chemicals
- Biopolymers and bioplastics
- Cosmetic agents and biopharmaceuticals
- Biofuels and platform chemicals

PROREACT BIOREACTORS

ENGINEERING AND MANUFACTURING

Manufacturing of PROREACT Bioreactors

Smaller production plants up to 10 m³ volume can be completely produced and approved as "package units" in the FRINGS factory in Rheinbach. Larger plants are delivered as prefabricated sub-systems and assembled and commissioned at site.



Medium Size PROREACT Package Unit

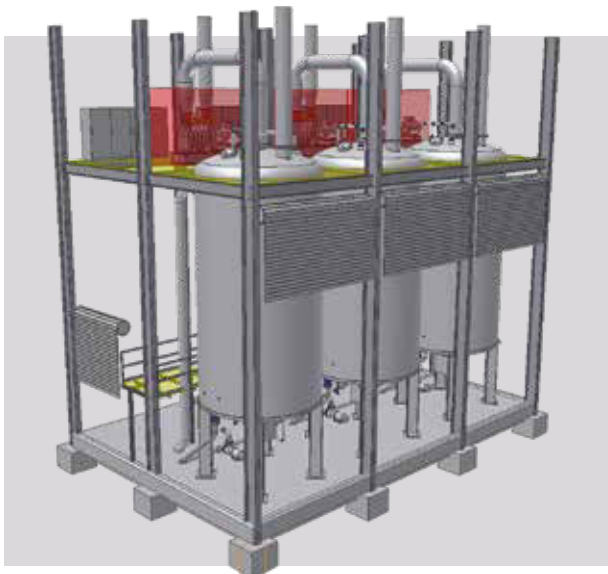
Engineering of Seed Trains and Large Scale Units

For industrial production plants, besides design and engineering each project is worked out using the economic principles with regard to investment, operating costs and performance of the fermenter or fermenter line in close cooperation with you as the customer.

FRINGS Engineering Toolbox

- Planning with MS PROJECT
- Flow diagrams in 2D-CAD
- Layout design in 3D-CAD
- Stress calculation with FEM
- Flow calculation with CFD
- Parts lists within ERP system
- Kinetics with MATLAB

Bioreactor Equipment



Engineering of PROREACT Large Scale Units



FOAMEX Foam Centrifuge



FRIBORATOR Stirrer/Aerator