



Equipment BPF

Summary

BPF has a broad range of equipment to support biotechnology process development at both lab- and pilot scale. We also do have the capability to set-up and run at demo scale for longer periods in a 24/5 mode.

Pretreatment & Hydrolysis

- Biomass pretreatment at batch (2-4 kg) and continuous scale (1000 kg/day)
- Enzymatic hydrolysis ranging from lab to pilot scale (lab ml – 9000 L)

Fermentation

- Fully compliant ATEX Fermentation from lab to pilot scale (10 L – 4000 L)
- FSSC and ATEX compliant Food Fermentation from lab to pilot scale (4 L – 2000 L)

Downstream Processing / Purification

- Fully compliant ATEX DSP on lab and pilot scale (covering all key purification / product recovery technologies)
- FSSC and ATEX compliant DSP (covering key food purification / product recovery technologies)

Chemical Conversion

- Fully ATEX compliant chemical reactors & vessels for chemical conversions
- Both standard and glass lined vessels, ranging from 250 L to 4000 L

The tables below show a more detailed overview of all capabilities.



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Laboratories

Fully certified to handle GMO and non-GMO.

General	<ul style="list-style-type: none"> • Shaker incubators • Bio safety cabinet (aseptical work) • Centrifuge (up to 2 L /run)
Pretreatment and hydrolysis labs	<ul style="list-style-type: none"> • 1 L and 7 L vessels for enzymatic hydrolysis • Autoclave (121 °C) • Muffle oven • Moisture balances
Fermentation labs	<ul style="list-style-type: none"> • Shake flask cultivation (up to 2 L) • 10 L, 20 L and 70 L fermentors
DSP labs	<ul style="list-style-type: none"> • 2 L pressure filter • Vacuum filtration • Tangential flow filtration system for ultra/microfiltration • Rotary evaporator • Chromatography columns
Analytical labs	<ul style="list-style-type: none"> • Common analysis equipment • 2 x HPLC (gradients, UV and RI detectors) • Total organic carbon analyser (TOC) • YSI analyser

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Pretreatment & Hydrolysis

Dry pretreatment	<ul style="list-style-type: none"> • Biomass mill: 240 kg/h
Bench scale pressing	<ul style="list-style-type: none"> • Tincture press: +- 3 L
Bench scale pretreatment	<ul style="list-style-type: none"> • 2-stage batch pretreatment installation <ul style="list-style-type: none"> ○ 50L pretreatment reactor with percolation vessel (stage 1) ○ 25L steam gun and cyclone (stage 2)
Bench scale hydrolysis	<ul style="list-style-type: none"> • 2 x 100 L hydrolysis vessels
Pilot scale pretreatment	<ul style="list-style-type: none"> • Valmet 2-stage continuous pretreatment installation: +-40 kg dry/hour
Pilot scale hydrolysis	<ul style="list-style-type: none"> • 3 m³ hydrolysis vessel • 2 x 9 m³ hydrolysis vessels
Solid/liquid separation	<ul style="list-style-type: none"> • Alfa Laval decanter • Filter press: 26 m³ / 420 L cake volume
Evaporation	<ul style="list-style-type: none"> • Pilot scale evaporator Estimated rate max 600 kg/h water



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Fermentation

Building fully certified to handle **GMO and non-GMO**. Partially **Atex**.

Fermentors	<ul style="list-style-type: none"> • 1 x 1000 L fermentor (non Atex) • 2 x 300 L and 4000 L fermentors (Atex) • Medium preparation vessels • Feed vessels
Centrifuge	<ul style="list-style-type: none"> • Disc stack centrifuge: 150 - 1500 l/h
Continuous Heat Shock	<ul style="list-style-type: none"> • Continuous heat shock installation (CHS)

Food

Compliant to **HACCP and FSSC**. Processes can be certified under **FSSC 22000**. Fully certified to handle **GMO and non-GMO**. Partially **Atex**.

Food fermentors	<ul style="list-style-type: none"> • 4L, 40L, 400L and 2 x 2000L fermentors • Medium preparation vessels • Feed vessels
Transportable vessels	<ul style="list-style-type: none"> • 1 x 500 L and 1 x 1000 L
Continuous Heat Shock	<ul style="list-style-type: none"> • Ultra-high temperature installation (UHT)
Food DSP	<ul style="list-style-type: none"> • Anhydro Spray Dryer • Evaporator Crystallizer • Fluid Bed Dryer • Ultra & Microfiltration (UF/MF) • Glass columns



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Downstream Processing

Building fully compliant to Atex requirements.

Process vessels	11 vessels <ul style="list-style-type: none"> • 1 x 250 L • 2 x 470 L • 4 x 1500 L • 4 x 4000 L
Chemical reactors	6 vessels <ul style="list-style-type: none"> • 2 x 320 L (Glass lined) • 2 x 415 L • 2 x 520 L (Glass lined)
Transportable vessels	8 vessels <ul style="list-style-type: none"> • 2 x 250 L • 5 x 450-550 L • 1 x 355 L (Glass lined)
Evaporators	<ul style="list-style-type: none"> • Small Glass Circulation Evaporator (KGOVD) • Large Glass Circulation Evaporator (GGOVD) • Forced Glass Circulation Evaporator (Flash) • Circulation Evaporator (OVD) • Falling film evaporator (VVD) • Super Rotavapor
Distillation	<ul style="list-style-type: none"> • Distillation unit
Centrifuges	<ul style="list-style-type: none"> • Clara Multipurpose Centrifuge • ComiCondor Inverting Filter Centrifuge • NA-7 Disk & Nozzle centrifuge • Rousselet Filter Centrifuge
Homogenizer	<ul style="list-style-type: none"> • Pressure homogenizer



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Downstream Processing continued

Building fully compliant to Atex requirements.

Membrane Filtrations	<ul style="list-style-type: none"> • Schule Filter Press • APV Membrane Filter Unit (MF/UF) • Exekia Membrane Filter Unit (MF/UF, non-Atex) • DDS-20 Ultrafiltration • Nanofiltration • 3 x Nutsche filters • Plate filtration • Filter housings for candle filters
Milling and mixing	<ul style="list-style-type: none"> • 2 x Granulator • Static Mixers • Alpine Mill
Extraction	<ul style="list-style-type: none"> • Liquid-Liquid Extraction Column
Chromatography columns	<ul style="list-style-type: none"> • 11 columns (glass, plastic, steel and BPG) • 3,4 L – 169 L volumes possible
Crystallisation	<ul style="list-style-type: none"> • Crystallisation vessel 62L
Electrodialysis	<ul style="list-style-type: none"> • Electrodialysis unit
Dryers	<ul style="list-style-type: none"> • Bolz Vacuum Dryer • Double Cone Dryer (Tumble Dryer) • Fluid Bed Multiprocessor • Spray Dryer • Vacuum Drying Cabinet • Ventilation Drying Cabinet

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