Biomass Pretreatment

Equipment overview:

Reactors for chemical pretreatment of biomass:
These jacketed and agitated pressure reactors are suitable for acid, alkaline, solvent-based and chemical pretreatment. The reactors have temperature and pressure control and are coupled to a vacuum system for the evaporation of solvents.
- Benchtop 0.5, 2, 5 L (jacketed, agitated reactors)
- 1 x 20 L (ATEX, Hastelloy, pressure 0.060–10 bara, up to 160°C)
- 1 x 85 L (ATEX, stainless steel, pressure 0.050–9 bara, up to 165°C)
- 1 x 250 L (ATEX, stainless steel, pressure 0.050–7 bara, up to 100°C)
- 1 x 500 L (ATEX, glass lined, pressure 0.050–9 bara, up to 180°C)
- 1 x 1000 L (ATEX, glass lined, pressure 0.050–5.4 bara, up to 165°C)
- 1 x 5400 L (ATEX, glass lined, pressure 0.050–5.4 bara, up to 165°C)

Reactors for enzymatic hydrolysis of biomass:
These jacketed and agitated atmospheric reactors are suitable for aqueous, temperature-controlled reactions.
- Benchtop reactors 0.5, 2, 5 L
- Multiple reactors in the range of 20 – 1000 L
- Reaction vessels for slurries with high solids contents: 2 x 500 L
- 2 x 4000 L
- 2 x 5000 L
- 4 x 8000 L
- 2 x 14500 L
- 1 x 20000 L
- 4 x 24000 L
- 3 x 50000 L (insulated, not jacketed)

Auxiliary equipment:
- Milling
  - Dry milling: biomass cutter, ball mill (bench unit)
  - Wet milling: pulper (2000 L), inline mixer, inline colloid mixer
  - Lab sonicator (batch, 1-250 mL) and pilot sonicator (continuous, 1000 L/day)
- Thermal treatment
  - Direct steam injection, jet cooker with holding tubes (4 x 50 L, max. 150 °C)
  - Heat exchangers for indirect heating
  - Refrgerated storage rooms, freeze and cool containers
  - Warehouse at ambient temperature with a storage capacity of 200 pallets
- Logistics and storage:
  - Truck (un)loading docks
  - Bulk solid biomass storage (55 t silo, 3x90 t bunkers)
  - Liquid storage (vessels up to 125 m³)
  - Dedicated areas for IBC storage
  - Chemicals storage
  - Dedicated areas for IBC storage
- Warehouse at ambient temperature with a storage capacity of 200 pallets
- Cool room at 4°C with a storage capacity of 130 pallets.
  - A wide spectrum of modular operation units
  - Operation at various scales

What we offer:
- Mechanical, thermal, physicochemical, and enzymatic pre-treatment of biomass feedstocks
- Logistics and storage:
  - Truck (un)loading docks
  - Bulk solid biomass storage (55 t silo, 3x90 t bunkers)
  - Liquid storage (vessels up to 125 m³)
  - Dedicated areas for IBC storage
  - Chemicals storage
  - Refrigerated storage rooms, freeze and cool containers

Expertise:
Experience in treating the following lignocellulosic raw materials:
- Agro-industrial side streams: paper pulp, spent grains, bagasse, press cakes, stillage...
- Agronomic by-products: corn stover, corn cobs, husk, fibre, stems, leaves, verge grass...
- Lignocellulosic crops: miscanthus, wood, wheat straw, bark...

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