THE CONTINUOUS TUBE DIGESTER SYSTEM

Proven technology in tailor made design

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ProZell has been engaged in the design and construction of pulp and paper mills for more than 30 years. ProZell possesses the most widely used system for the continuous cooking of non-wood fiber plants. The tube digester is superior to all other alternatives due to long-term development work, along with practical expertise resulting in the successful completion of over 200 pulp mills. The tube digester system is the best economic investment for pulp mills utilizing non-wood fiber plants (all types of cereal straw, bagasse, kenaf, reed, cotton linters, grasses, bamboo, etc.), the basic raw material. In addition to superior production of pulp from annual fiber plants, the horizontal tube digester system is well suited for the manufacturing of wood based pulps as well as processing of secondary fibers.

DIGESTER DESIGN
The digester components are available in a variety of sizes according to a modular design system. This means that a tailor-made digesting unit can be created to meet any operational situation and all raw material, technological, construction material and design requirements.

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THE SCREW FEEDER
The screw feeder is designed for the full control of the input of cellulosic raw material into the digester tubes of the continuous digester. Wood chips and many types of agricultural fibers can be fed through the screw-type feeder in precise quantities. The feeder is available in the four basic diameter sizes of 400, 500, 600 and 660 mm as well as in a variety of compression ratios. This makes it adaptable to a wide range of materials and production rates.

Other feeder features include:
- Variable speed drive which permits precise control of input where appropriate, allows the choice of the best speed for minimum wear of the feeder when processing non-wood plant fibers (bagasse, straw, etc.) and wood chips and makes the system flexible over a wide range of materials and production rates.
- The availability of each basic size in proven modifications adapted to different raw materials. This ensures a tight plug against the digester pressure.
- The adapted compressive action of the screw feeder which enables the removal of excess moisture and air from the feed material while it is conveyed into the pressure zone. The result is improved liquor penetration and the ability to adjust to the optimum ratio of liquid to raw material.
- In addition to superior production of pulp from annual fiber plants, the horizontal tube digester system is well suited for the manufacturing of wood based pulps as well as processing of secondary fibers.

THE INLET CHAMBER
In an initial step towards homogenous digestion, the inlet chamber mixes the incoming decompressing raw material with steam and the cooking liquor. The enclosed stop valve offers full protection against blow-backs and losses of steam. The inlet chamber possesses:
- A special cooking liquor atomizing nozzle that facilitates the complete mixing of the feed solids with steam and cooking liquor, thereby ensuring optimum heat transfer. Automatic control, linked to the load sensor of the screw feeder motor. If the plug in the screw feeder should weaken, the stop valve then serves as an automatic tightening device. Both heads of the double acting air cylinder are cushioned and it is equipped with a solenoid valve and supported by a steam equalizing valve.

The tube includes:
- Time control screws that move the materials to be cooked through at controlled and uniform speeds. This ensures adherence to the predetermined digestion time for each digester tube. For lower requirements, mixing screws are available.
- The automatic and accurate control of temperature, pressure and chemical concentration.
- Design that meets any process requirement by individual use or multiple arrangements. Supplementary tubes can be added for subsequent increases in capacity.
- Suitability for steaming, impregnation, cooking, extraction and other reaction stages.

THE DIGESTER TUBE
The digester tube is a continuous autoclave designed for processing agricultural fibers, wood chips, and other raw materials. It can be used both for vapour phase cooking with low liquor to wood ratios and for totally submerged cooking at high liquor ratios.

The digester tubes are available in diameters ranging from 600 to 2100 mm and in processing lengths of between 6 and 14 m.

THE DISCHARGER
The paddle-type discharger is designed for the continuous and uniform transfer of the digested material (including high consistency pulp such as softened wood chips) from the high-pressure digester tubes of the continuous digester to the blow tank (both hot and cold blow).

The discharger has a range of advantages:
- A constant speed impeller in the pressure zone, which maintains maximum discharger efficiency by wiping the face of the orifice in the adjustable discharge valve.
- A low operational power requirement per ton.
- Automatic level control in the cold blow chamber when cold blowing is required.
- Controlled velocity and dilution liquid quantities, particularly in the case of cold blowing without an impeller, maintain circulation at the correct discharge consistency.
- Suspension from the digester outlet flange, rendering floor mounting unnecessary.
- The possibility for connection to the junk chamber and two further flanged outlets, providing a spare blow line and ease of maintenance.

HIGHLIGHTS
- Proven technology
- Superior cooking of nonwood fibers
- Ideal for high yield wood pulping
- Tailor made modular design
- Global references