

Bamboo Pulp Fiberline with Compact Cooking™ and light ECF bleaching

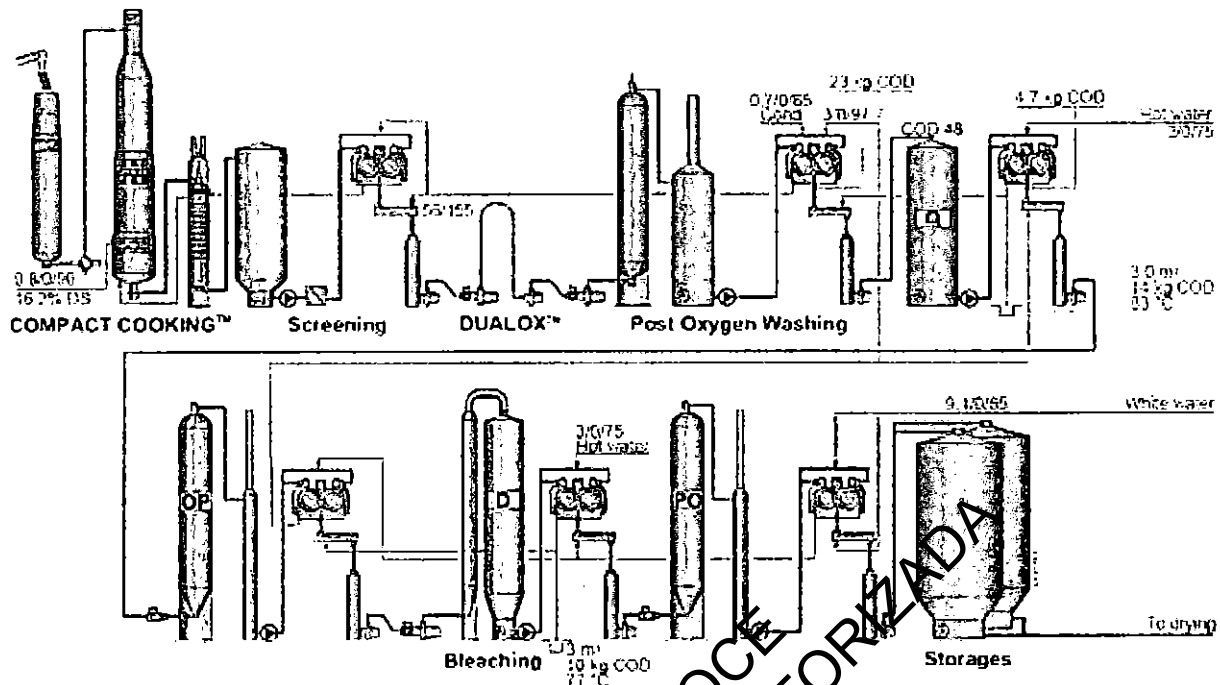


Figure 19

For oxygen delignification we recommend the two-stage DUALOX™ system. We have here a short first stage, approx. 6 minutes, and a second stage with 60 minutes retention. Between the stages a second MC-pump is installed. With this we can increase the pressure in stage two to up to 6 bar on the reactor top. This is important from a kappa reduction point of view. For post-washing after oxygen delignification we recommend two Compact Press™ in series. Kappa after cooking is 16-18 and after oxygen delignification around 8.

For bleaching there are several possible sequences as earlier discussed. This is depending on brightness demand, environmental issues, etc. The sequence Q(PO)D(PO) is an alternative if we go for light ECF. In this case the storage tower between the two post-oxygen wash presses also acts as a Q stage. We can for this bleaching sequence expect the following consumption figures for bleaching to brightness 89 % ISO:

- ClO_2 as active chlorine 12 kg/ADT
- H_2O_2 (charge) 18 kg/ADT
- NaOH 32 kg/ADT
- H_2SO_4 8 kg/ADT
- Water including white water 15-20 m³/ADT
- Steam ~ 500 kg/ADT
- Total effluent volume ~ 10 m³/ADT
- COD in effluent 24-26 kg/ADT

Another possible bleaching sequence is D0(EOP)D1(PO), figure 20, which is earlier discussed. With this sequence the peroxide charge can be reduced to approx. 12 kg/ADT, but the ClO_2 charge has to be increased accordingly to approx. 24 kg act. Cl/ADT. For this sequence we also need totally 7 wash presses for the fibre line instead of 6 for the light ECF sequence.

Bamboo Pulp Fiberline Kvaerner Pulping proposed fiberline with Compact Cooking™, Bleaching sequence D0-EOP-D1-PO

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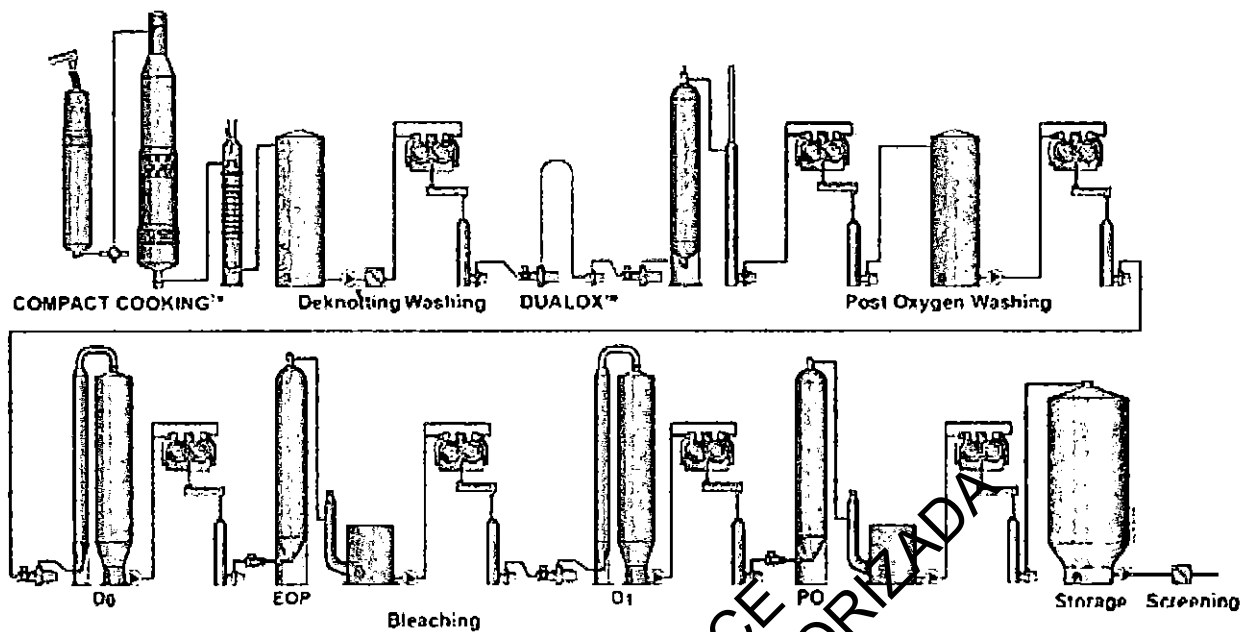


Figure 20

Finally:

The continuously increasing demand for virgin pulp has made less conventional materials for pulping interesting.

As shown in this presentation bamboo fibre is such a material.

Bamboo is in many aspects an excellent raw material for pulp. Some special aspects must however be taken into consideration when designing a bamboo pulp mill due to the high SiO_2 content in the raw material.

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