

Fact Sheets – Bell Bay Pulp Mill

Process overview

- The Kraft process used in the mill is a very efficient pulp production process, as wood residues removed chemically from the wood fibres (mainly lignins) are combusted in a recovery boiler to generate power, while process chemicals are recycled in the same process. The pulp production process, in simple terms, is as follows:
 1. Woodchips: plantation-sourced wood is debarked, chipped and screened – the fine waste is fed into a power boiler and the chips into the digester for cooking.
 2. Cooking: chips are mixed with caustic soda (white liquor) to dissolve the lignin (the natural gluing agent in wood) and free it from the cellulose fibres.
 3. Washing: cellulose fibre is separated from the lignin or black liquor (which then goes to step 7) and cooking chemicals by repetitively washing the pulp. Filtrate is removed from the pulp after each wash to remove as much lignin as possible.
 4. Oxygen delignification: as much as possible of any remaining lignin is removed from the fibre through the use of oxygen and caustic soda.
 5. Bleaching: common bleaching agents including hydrogen peroxide and chlorine dioxide, which is increasingly being used to treat drinking water, are used to eliminate residual lignin and colour, leaving white pulp.
 6. Drying: the pulp is dried, baled, packaged and stored ready for sale.
 7. Evaporation: water is removed from the black liquor by evaporation so that it can be used as fuel in the recovery boiler.
 8. Recovery boiler: black liquor is burnt in the recovery boiler, generating steam, which drives the turbine as well as being used in other pulp processes. Inorganic chemicals used in the cooking process are recovered at the same time.
 9. Re-causticising: recovered inorganic chemicals are reacted with burnt lime to regenerate (for recycling to step 2) white liquor for the digester and lime mud.
 10. Lime kiln: the lime mud is fed into the lime kiln before being recycled for re-causticising. Lime is essential for making caustic soda for the cooking process.
 11. Power boiler: plantation bark, fines from woodchips, dewatered sludge from effluent treatment and plantation waste are burnt in the power boiler to generate steam and electrical energy.
 12. Oxygen plant: oxygen is extracted from the air to be used in delignification and hydrogen peroxide production.

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13. Bleaching chemical preparation: inorganic salt (sodium chloride) is used to produce bleaching agents in a chemical plant. Hydrogen (by-product) is used together with oxygen for hydrogen peroxide production.

Chemical Plant Concept

