

KRAFT PULPING

PULP MAKING PROCESS

1 Wood Receiving & Handling

Wood Chip Supply - New Brunswick forests not only provide world class hardwood and softwood lumber, but also provide the high grade wood chips used to make our kraft pulp.

Receiving - The chips delivered from our sawmills or dedicated chipping operations are stored in separate hardwood and softwood chip piles, to be used by the pulp mill.

Processing - The chips are first screened to remove knots and sawdust. The knots and sawdust, along with bark, are burned for energy. Every part of the tree is used.

2 Fiberline

Digesters - The screened wood chips are put in large pressure cookers (digesters) with a cooking liquor (recycled chemicals). As steam is added, the wood chips are partially dissolved, leaving only fibers (pulp) and spent (recovered) cooking liquor.

Brown Stock Washing - The pulp (now called brown stock) is washed to remove the used cooking liquor. The used cooking liquor is sent to the Chemical Recovery area for recycling and used again in the process.

Brown Stock Screen Room - The brown stock undergoes four stages of screening to remove uncooked wood and debris.

Oxygen Delignification - Oxygen is used in two large pressure vessels to further remove lignin, the glue that holds wood fibers together.

Bleach Plant - The pulp is gradually whitened in a multi-stage process where elemental chlorine-free (ECF) bleaching chemicals are used under tightly controlled conditions. Chlorine free pulp is better for the environment. We have been producing it since 1995.

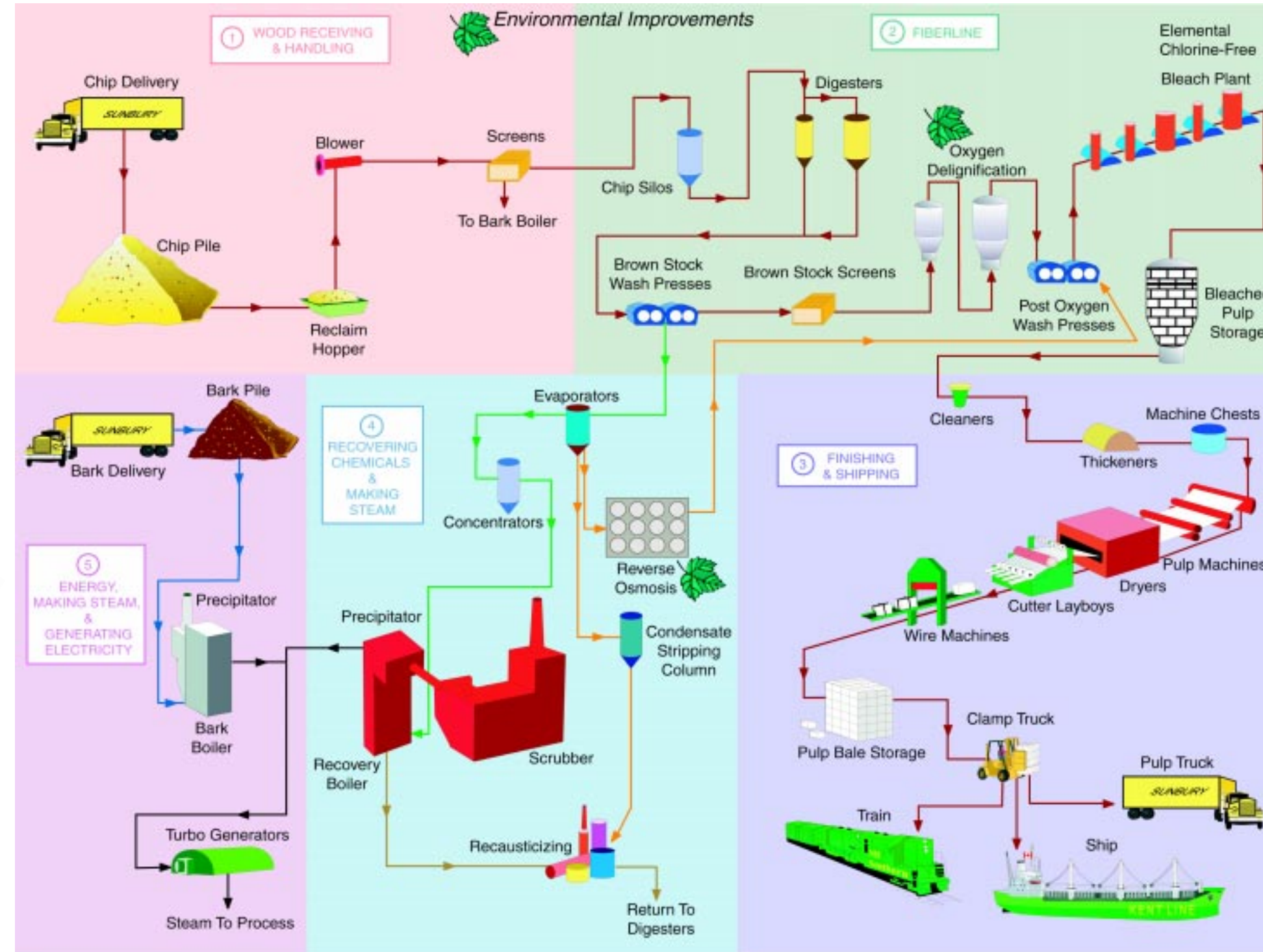
Bleached Screen Room - In the bleached screen room, cleaners are used to remove any grit or debris that may be left in the pulp to ensure its cleanliness.

3 Finishing & Shipping

Machines - The cleaned white pulp is fed to the three pulp machines. On the machine, the pulp is formed into a continuous sheet, pressed and dried, then cut and slit into smaller sheets, which are stacked to form bales of pulp, our finished product.

Shipping - Here the bales of pulp are weighed, labelled and sent to various customers world-wide via railcar, truck or ship.

PRODUCING KRAFT PULP



RECOVERY

4 Recycling Chemicals & Making Steam

Evaporators - Evaporators thicken the spent cooking liquor by evaporating water so that the liquor can be easily burned. The water that evaporates is cooled and becomes condensate.

Condensate Stripper - This process removes the wood alcohol from the condensate streams. The recovered wood alcohol is then used as fuel in the bark boiler. The cleaned condensate is reused.

Reverse Osmosis - Another condensate stream is polished (cleansed) using membrane technology to produce a very clean stream, which is used in the brown stock area. A number of filters (membranes) are used to clean the used brown stock.

Recovery Boiler - The recovery boiler burns the thickened spent cooking liquor to produce steam and smelt (recovered chemicals in a molten state). The smelt is dissolved and sent to recausticizing for further processing.

Recausticizing - The dissolved smelt is further processed with lime to produce new cooking liquor for use in the digesters.

5 Energy, Making Steam and Generating Electricity

Utilities - In addition to the recovery boiler, steam is produced by a wood waste boiler and a stand-by oil fired boiler. The wood waste boiler burns knots and sawdust which were removed in chip screening along with bark delivered from sawmill operations.

The steam generated is used for evaporating, heating, cooking, and drying the pulp. Steam is also used to drive two turbogenerators that produce enough electricity to supply most of the mill's needs.

Frequently Asked Questions...

Q: How much wood does it take to make one tonne of kraft pulp at Irving Pulp and Paper?

A: We use chips from sawmills and dedicated chipping operations, which equate to 2.2 cords of wood or about 17 trees.

Q: What do you do to ensure your wood supply?

A: J.D. Irving, Limited was the first forest products company in Canada to initiate a large scale reforestation program when many doubted it could be done. Renewing our forest resource is a way of life at J.D. Irving, Limited. Since 1957, we have planted over 500 million trees of 7 native species. That's a national record which preserves New Brunswick forests for the benefit of generations to come.

ENVIRONMENTAL IMPROVEMENTS

In the past several years, over \$250 million dollars have been invested in extensive environmental and operational improvements. We are investing in the future and are committed to being environmentally responsible.

Irving Pulp and Paper has eliminated chlorine gas as a bleaching chemical from its pulping process.

We have significantly reduced the environmental impact of our discharge streams by installing a closed system of brown stock wash presses and screens.

The new two-stage oxygen delignification process has significantly reduced the levels of lignin released into the environment. Lignin is the "natural glue" that holds wood fibers together.

Evaporator and digester condensates contain wood alcohol. Contaminants in condensate streams are removed using a stripping column or by reverse osmosis technology, and then incinerated. This is first in the world technology.

Irving Pulp and Paper partnered with the University of New Brunswick, Saint John in 1997 to investigate the effects of bleached kraft effluent on fish. The three-year study has confirmed that:

- The final mill effluent meets the regulatory requirements without conventional secondary treatment (lagoon).
- The process changes are indeed removing hazardous materials, called endocrine disrupters, which affect the reproductive systems of fish.

These findings confirm that the **pollution prevention** approach of minimizing discharges is a viable alternative to **pollution treatment** of kraft pulp mill final effluent (lagoon).

What is Kraft Pulp used to Make?

Newspapers, surgical gowns, tea bags, fine printing, writing and photocopy paper, tissue paper and even currency papers are being made around the world using the quality kraft pulp produced right here in Saint John!

Questions or Comments?

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Irving Pulp and Paper produces world class kraft pulp that is shipped to customers around the globe to international ISO 9000 standards. Kraft pulp is the strongest and most widely used commercial pulp grade available. 'Kraft' is a German word meaning STRONG.