

FINLAND

IMPROVEMENTS ADD CTMP LINE TO ENSO'S IMATRA MILLS

DONALD G. MEADOWS

DOMINANT LIQUID PACKAGING BOARD MILL ALSO UPGRADES ENVIRONMENTAL EFFORTS.

THE TAMPELLA POWER RECOVERY BOILER AT ENSO OY'S Kaukopää mill in Imatra, Finland, is about three years old. It was installed as part of an extensive upgrade of the mill complex first conceived in 1988. Work on the two-phase

project began in 1990. It included the installation of a new chemithermo-mechanical pulping line, a new effluent treatment plant, and related equipment.

From the top of the recovery boiler, looking to the southeast, you can spot the Svetagorsk mill in Russia. Both mills produce liquid packaging board (among other grades) and shop many of the same suppliers. Svetagorsk, now owned by Tetra Laval, will be covered in a future issue of *TAPPI JOURNAL*.

Enso, which merged with Veitsiluoto Oy in May of 1996, claims to be the world's biggest manufacturer of liquid and food packaging boards. Its Imatra mills, which include the Kaukopää pulp and paper complex and the Tainionkoski paper mill, have an annual board production capacity of 810,000 metric tons. They constitute the largest integrated mill in Europe, according to Martti Savolainen, communication manager for Enso. Together, the mills employ about 2000 people.

The first pulp mill at Kaukopää began production in 1935. Tainionkoski's pulp mill first started in 1961. The Imatra mills now consume about 3.5 million m³ of wood

annually, half as pine, half as birch. Although most of the wood comes from Finland, including 588,000 ha of forest owned by the Enso Group, the company is the largest importer of wood—mostly birch—from Russia and the Baltic region.



The Kaukopää mill sits between Lake Saimaa and the Russian border

After years of rebuilds and upgrades, the three paper and four board machines at Imatra are a hodge-podge of equipment. PM 8 is the closest thing the mill has to a purebred machine. It was built by Valmet and installed in 1982. BM 1 dates back to 1950; BM 2, dating back to 1956, was totally rebuilt by Tampella in 1990,

although the dryer section remains largely a Beloit design. Plans for further rebuilds are in the works.

THE CTMP LINE

The mills commissioned the 200,000 tons/year bleached CTMP pulp line for the liquid packaging board line about a year ago. A polyethylene coating line started up in the summer of 1996. Sunds Defibrator supplied the chip washing, impregnation, refiner and heat recovery systems for the pulp line. Andritz supplied the wash presses for the line and ABB supplied the motors. Total cost of the project was about 300 million FMK (roughly US\$ 55-60 million).

As part of the single-stage refining system, the mill installed two RGP 76 CD conical refiners. Each refiner



Much of the birch used for pulping at Enso's Imatra mills comes from Russia

has a connected power of 20 MW and each has a 300 ton/day capacity. Kaukopaa is the first in Finland to install such large refiners, according to Sunds.

The CTMP line uses 100% spruce—half as sawmill chips, half as roundwood chips—to produce pulp for the middle layer of three-ply liquid packaging board produced on the mills' No. 2, 4 and 5 board machines. Annual capacity on those three machines ranges from 210,000 to 230,000 tons each.

Using CTMP for the middle layer allows for a reduction in grammage weight used to make standard 1-L, gable top cartons for liquids. The basis weight for such

ENSO'S NEWEST FINE PAPER LINE

Enso's mill in Oulu, Finland, inaugurated a second fine-paper line in September of 1997. The line, which started up in April, has an annual production capacity of 360,000 metric tons of coated fine paper.

The "Lumina 7" line includes a gap-former wire section and shoe press, plus on-machine pre-coating and Optiload calendering. PM 7 will produce lighter paper grades for glossy and matt multi-coated art printing papers.

The mill also increased annual capacity on PM 6 by 70,000 metric tons, for a total mill capacity of 760,000 metric tons/year. The paper mill uses about 80% of the pulp produced by the Oulu pulp mill, plus birch pulp from other Enso mills.

Along with the expansion of the paper mill, a 246 MW power plant was completed at Oulu. The plant burns bark and peat for fuel.



Wood yards, rejects and a power station at the Kaukopaa mill

cartons has dropped from about 360 g/m² in 1960 to about 280 g/m² in 1997. Enso expects to shave another 10 g/m² from that this year.

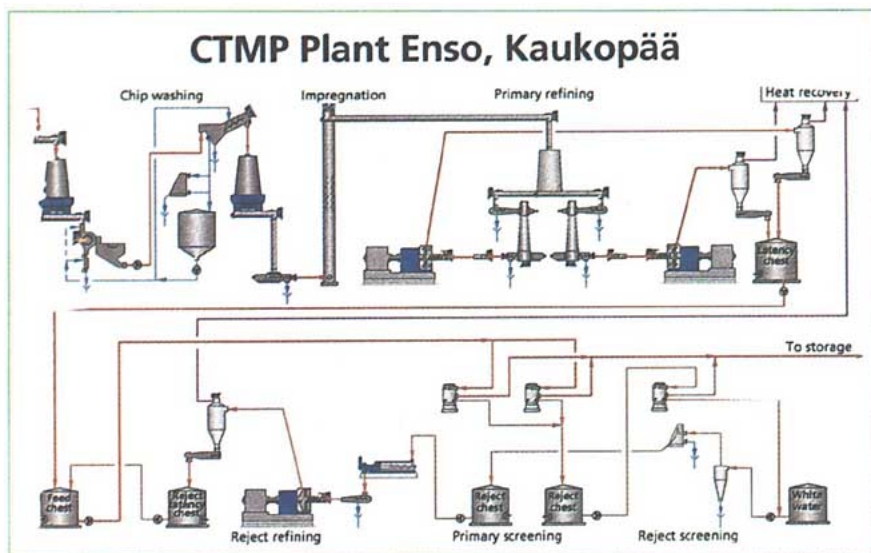
ENVIRONMENTAL IMPROVEMENTS

During 1991 and 1992, Imatra spent more than 300 million FMK on environmental protection projects. The money was spent on:

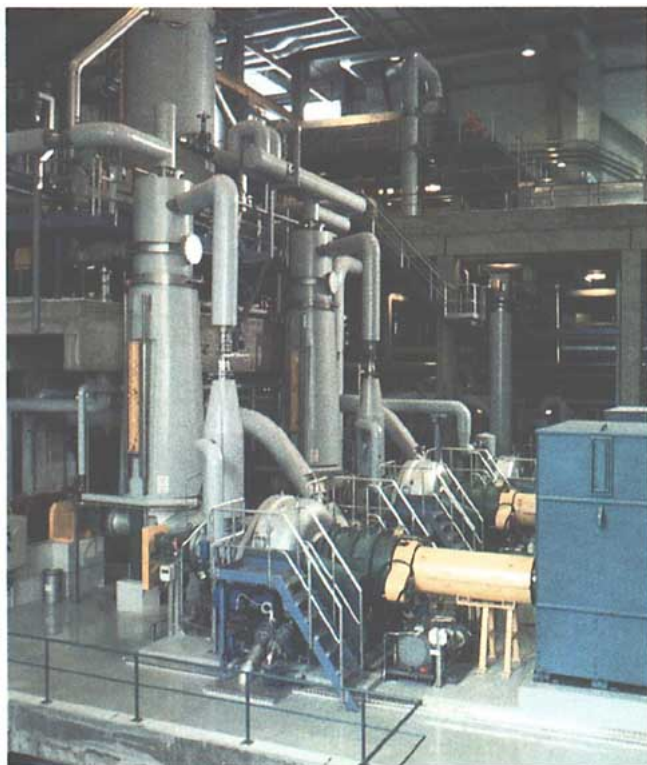
- biological and waste water treatment plants
- collection and combustion of malodorous gases
- improved treatment of flue gases
- treatment system for coating pigment waters

The investment has paid off. Particulates were reduced from about 2 kg/ton in 1991 to barely 0.2 kg/ton in 1995. Total sulfur dioxide dropped from about 4.5 kg/ton of product to roughly 1.5 kg/ton for the same period. An additional scrubber was installed in the malodorous gas boiler in 1997 and improvements were being planned in the process for burning gases in the recovery boilers.

Effluents also dropped significantly. From 1991 to 1995, AOX went from about 1.1 kg/ton to roughly 0.38 kg/ton of pulp produced. It dropped below 0.22 kg/ton of pulp for 1996. COD fell from just over 80 kg/ton to about 33 kg/ton and BOD dropped from nearly 23 kg/ton to about 3 kg/ton from 1991 to 1995.



A schematic of the CTMP plant at Enso's Kaukopää mill



The Sunds Defibrator RGP 76 CD refiner at Kaukopää

Kaukopää began using a biological effluent treatment system about four years ago. To compensate for loading peaks, the mill can add oxygen for aeration. It added water cooling towers during the summer of 1997 to improve the efficiency of the biological system during warmer months. Under normal operations, a constant flow of warm water protects the bacteria from the harsh Finnish winters.

Bleaching is either elemental chlorine-free (ECF) or totally chlorine-free (TCF). For ECF, the mills use an Eop-D-PO-D sequence. For TCF, the sequence is Eop-Q-PO-PO.

Imatra's environmental objectives for the year 2001 include:

- reducing the volume of waste waters, organic chlorine compounds and landfill waste by 70%
- reducing hazardous organic compounds by 25% from 1995 levels
- reducing sulfur dioxide emissions by half.

During 1996, the mills focused on developing operating models for the environmental systems. An eco-balance study was begun in 1996 and a survey of environmental risks was planned for 1997. Staff also received extensive training in environmental protection. **TJ**

Meadows is editor of TAPPI JOURNAL; email: dmeadows@tappi.org.