Two of Finland's heavy hitters prepare to alleviate demand

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Coated paper grades are gaining strength all over the world, especially LWC and SC. In Finland, a traditional birthplace of technology for these grades, two mills prepare to enter the next century with expansion.

Finnish mills have earned a reputation for ingenuity and leadership in the coated and supercalendered papers sector of the paper industry. The Finns don't seem to be afraid to try anything new to get the job done faster and to be more competitive. The Finnish mills, especially, act as testing grounds for papermaking technology from names like Valmet, Tamfelt, Ahlström, and Tampella, all for the sake of improved production.

Ideas, especially in publication grade papers, seem to have taken off in Finland lately. Two Finnish printing and writing mills are among those putting Finnish technology to work trying new ideas—adding new technology and capacity to set new standards in papermaking.

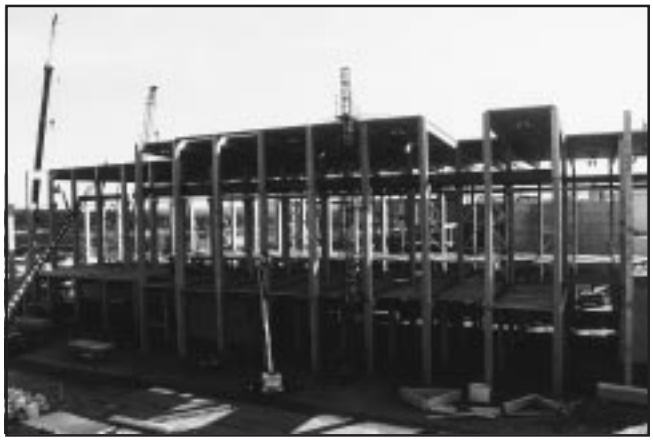
Metsä-Serla Kirkniemi

Located about an hour's drive from Helsinki, Metsä-Serla's Kirkniemi mill is known as a pioneer of lightweight coated (LWC) papers in Europe. When its PM2 was converted to LWC in 1972, it was the first LWC line in Europe. However, Kirkniemi's day as pioneer isn't over yet. In the fall of 1996, it will launch a new line, PM3, which will produce a new product called KIRI—a double-coated fine paper grade.

When PM3 comes on line this fall, Kirkniemi will be 30 years old. In 1968, PM1 was converted to manufacture supercalendered (SC) paper. In 1972, PM2 was built, bringing LWC to Europe. In 1982, PM1 was rebuilt, and again in 1993 when it was converted to manufacture film coated offset (FCO) papers. Both machines specialize in papers for magazine, catalog, and insert paper grades, with low basis weight and high quality key to production. PM1 is capable of producing about 170,000 metric tons/year, while PM2 is capable of 180,000 metric tons/year.

FCO paper produced by Valmet-built PM1 is a relatively new grade. Produced using pulp from Metsä-Serla's Metsä Rauma pulp mill, the main difference in this grade occurs in the coating process. Coating is applied to the rolls by an applicator, rather than applying it directly to the paper, as with a blade. With the roll applying the coating to the paper, the FCO method fills in gaps that would otherwise be left by blade coating. The result is a smoother sheet. The FCO stock is also supercalendered to create a low-density paper. The technology was part of a project funded by the Technology Development Centre of Finland. With an extremely light density of 48–60 g/m^2, end uses of the paper include magazine body stock, brochures, catalogs, inserts, and advertising material. Since the product uses pulp from Metsä Rauma, a totally chlorine free (TCF) version of the FCO grade is available.

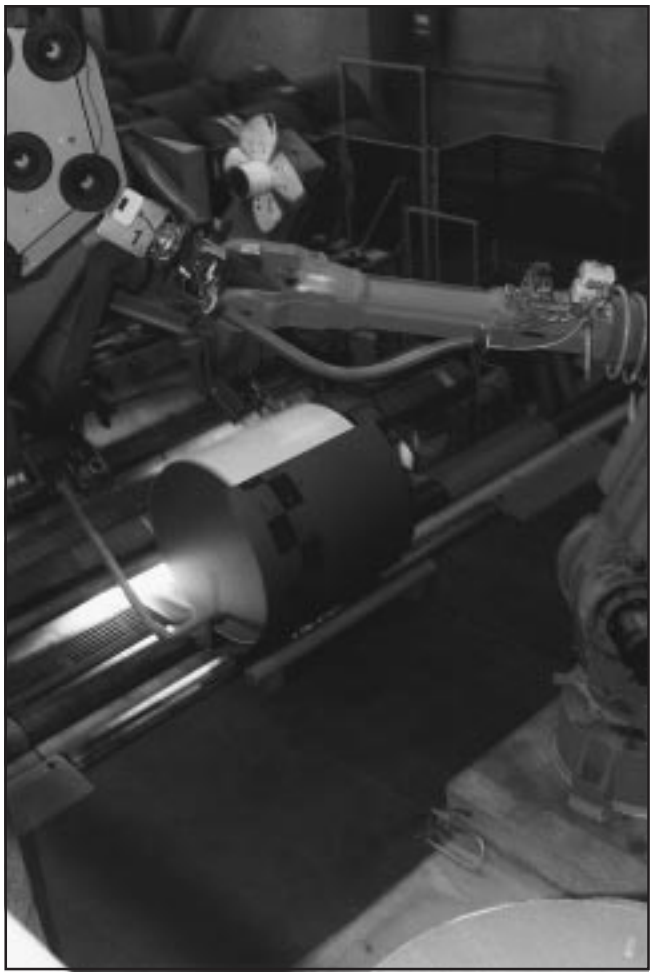
Construction of the new PM3 expansion at Metsä-Serla's Kirkniemi mill, as of August 1995



PM2 produces Metsä-Serla's Gallerie Brite and Kirkblade magazine papers. Gallerie Brite is a high brightness coated paper used in high quality special interest magazines with a weight range of 60–90 g/m^2. Kirkblade is Kirkniemi's LWC offset paper with a 54–80 g/m^2 weight range. It is used mostly as magazine and catalog body stock. Both papers are available in a TCF version.

The PM3 expansion is the latest advancement to hit Kirkniemi. Supplied by Valmet, PM3 will be the largest double-

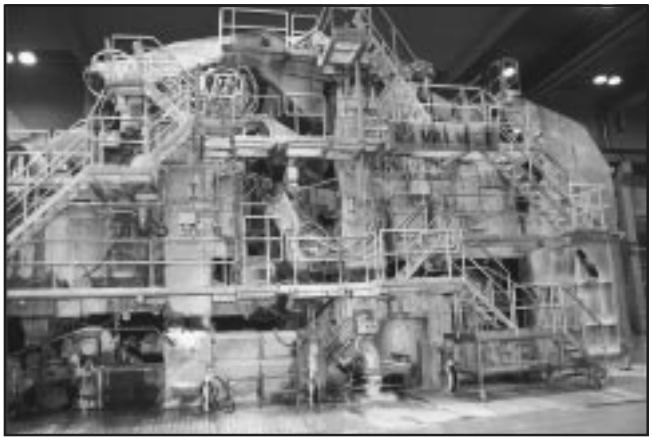
A roll is wrapped at Kirkniemi using a fully automated system.



United Paper Mills Jämsänkoski PM6, manufactured by Valmet, is 431 ft in length.



A view of the headbox and forming section of Jämsänkoski PM6



coated fine paper machine in the world when it comes on-line. Total capacity is designed for 300,000 metric tons/year, which will boost Kirkniemi's total output to around 700,000 metric tons/year. The wire length is 9 m, or roughly 320 in. Valmet engineers estimate the machine will operate at 1500 meters per minute (roughly 4500 ft/min).

PM3 will not be housed in the same building as Kirkniemi's other two machines. A separate 1.1 million m^3 structure, which will effectively double the size of the mill, is under construction next to the current mill. Earth moving for the building's foundation has displaced 1 million m^3 of rock and soil from the site. A natural gas co-power plant will be built on-site as part of the expansion to provide power for the huge machine. A 32-km long gas pipeline to operate the power plant will be run from the town of Kirkkonummi. The plant will allow the mill to supply itself with electricity. The facility's construction is being undertaken by a different team than that which runs the mill. This is so that management could concentrate on production, not construction. When the PM3 facility is complete and on-line, it will be incorporated into the rest of the mill's operations.

Kirkniemi will create about 120 jobs when it starts up the new machine. As of Fall 1995, the mill had received some 5000 applications for the 120 positions. With the additional manpower, the mill estimates its employment will rise from 720 to about 850. Kirkniemi is working with nearby Lohja Vocational College in preparing courses to train and skill workers before they begin work on the new machine. The new machine represents an investment by Metsä-Serla of over FIM 2 billion (US$ 465 million). The construction alone is said to have an impact of at least FIM 4 billion (US$ 930 million) over the two years of the project.

As for the KIRI product to be produced by PM3, it will be a double-coated fine paper that will compete with MWC and LWC papers, designed for high-quality publications. KIRI will be available in gloss and matt finishes, making the weight range from 70 g/m^2 to 115 g/m^2. Kirkniemi's key markets are in France, Germany, and the United Kingdom, and that is where Metsä-Serla has targeted KIRI development. KIRI, according to Metsä-Serla, is the result of cooperation between the customer, the sales organization, and the mill.

SC paper from Jämsänkoski's PM6 is reeled at the end of production by a Valmet OPTIREEL system.



United Paper Mills Jämsänkoski

Since the early 1980s, readers of industry magazines have seen stories about another large paper mill in Finland, United Paper Mills' Jämsänkoski. Jämsänkoski started in the 1960s with a Wärtsilä machine as PM3, manufacturing woodfree specialties. PM4, made by Ahlström, was added in 1974 and expanded the mill's range of products to include matt coated offset (MFC).

PM3 has been rebuilt twice, once in 1986 by Wärtsilä and Valmet, and again in 1989 by Valmet. It produces mostly label stock between 60 g/m^2 and 100 g/m^2 in basis weight. It operates at about 600 m/min, roughly 1800 ft/min, utilizing a size press and surface blade coating. It is the only one of Jämsänkoski's machines that uses a fourdrinier headbox. PM4, originally built by Ahlström, has been rebuilt three times, once by Wärtsilä in 1985 and twice around that time by Valmet, once in 1983 and again in 1987. The 220-in.-width machine operates at an average speed of 750 m/min, or about 2250 ft/min, producing UPM's high-bulk, glossy mechanical grade Jamsa Satin for magazines and books.

The true headliners at this four-machine mill are Jämsänkoski's PM5 and PM6, added in 1981 and 1992 respectively.

PM5 produces UPM's Jamsa Gravure brand SC paper for magazines and catalogs. The machine produces about 230,000 metric tons/year. With a trim width of 8400 mm (330 in.), the machine runs at 1200 m/min (about 3600 ft/min). The Valmet machine has two supercalenders that produce a paper weight of 40–60 g/m^2. PM5 produces about 230,000 metric tons/year of Jamsa Gravure paper. A new test of Jämsänkoski will come in late 1996, when a rebuilt PM5 will debut. Scheduled to begin in March 1996, the rebuild will include a new headbox from Voith Sulzer and a new gap former. The rebuild will also include a new OPTIREEL from Valmet.

The real star of Jämsänkoski, though, is PM6. Started in October 1992, PM6 was, at one point, the fastest SC machine in the world. Its record was recently broken by Norske Skogindustrier's PM6 in Halden, Norway—a machine of relatively similar type and by the same manufacturer, Valmet. Jämsänkoski's record may have been broken, but its quality and spirit have not. PM6 manufactures UPM's JamsaMax and JamsaCat papers. JamsaMax is designed for use in standard gravure printing, while JamsaCat is for use in catalog and magazine printing. At the time of startup, PM6 represented a FIM 1.6 billion (US$ 280 million) investment by UPM.

The machine itself is massive. The housing for PM6 alone is double the size of that of PM5. Production on the machine is 925 metric tons/day, adding up to about 330,000 metric tons/year. Combining this with PM5, the Jämsänkoski mill produces about 560,000 metric tons/year of SC paper alone. If combined with Jämsänkoski's other two machines, PM3 and PM4, the mill outputs about 710,000 metric tons/year. With a length of 430 ft, and a wire width of 366 in., Jämsänkoski's PM6 is one of the largest and fastest paper machines in the world. The machine was designed to run at 1500 m/min, about 4500 ft/min. However, on February 14 and 15, 1995, PM6 ran for 24 hours at an average speed of 5282 ft/min, roughly 60 miles per hour. PM6 broke a record previously held, amazingly enough, by itself at 1584 m/min, about 5196 ft/min. The machine produced SC-A for the entire period without one web break.

PM6 has three supercalenders which stand vertically, stretching from below former level to nearly as high as the dryer housing. Raw materials for the machines come from thermomechanical pulp (TMP) produced from spruce on-site and sulfate pulp from other sources. About 30% of raw materials are fillers, mostly kaolin imported from the United Kingdom and Georgia in the United States. Both lines have the availability to use recycled fiber.

UPM employs 925 employees at Jämsänkoski, 60 more than it did before PM6. Sales of Jämsänkoski products mostly go to publishers and catalog printers in Europe and North America. UPM holds about 23.5% of the SC market, according to company figures. Sales to German companies number first, accounting for 152,900 metric tons, or about 22.9% of sales. Companies in the United States are second, with 152,500 metric tons, or 22.8%. TJ

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