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BORMIDA MILL - ITALY

PM3 & stock preparation system (PM2 and PM3)

Technical specification



(Bormida mill, Italy - PM3)

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1. General information

„Bormida S.p.A in liquidazione“ is an Italian paper mill located in the province of Savona (in the north western part of Italy) which has recently gone bankrupted due to the general crisis affecting paper producers worldwide. In September 2012 the mill filed for the so-called „Concordato preventivo“ („Agreement with Creditors“), the Italian procedure which allows a company to restructure their debts by making an agreement with their creditors (privileged and unprivileged). This not having been legally authorised, the company was finally declared bankrupted in December 2012. All the mill assets have been divided by estimator appointed by the Italian law court of Savona into (8) different lots; lot n. 2 (paper machinery for Test-liner, hereafter indicated as „PM3“) and lot n. 3 (**common stock preparation for PM2 and PM3**, hereafter indicated as „stock preparation system“) have been recently acquired by **Papcel a.s.**, manufacturer of paper machinery since 1950 having their headquarters in Litovel, Czech Republic. The mill comprises (2) paper machinery, one producing fluting (PM2) and the other Test-liner (PM3), both having a common stock preparation system designed to operate with mixed waste paper. In particular, PM3 has been completely rebuilt in 1993 – 1994 (some parts provided as new in 2002) and its mechanical conditions are exceptionally good.

2. Inspection of PM3 and stock preparation system

Inspections of PM3 and stock preparation system can be carried out at any time upon prior written agreement at Papcel' s storage (in Czech Republic). The dismantling works, which started in November 2013, have already been completed and all goods are now stored in standard 40 feet containers. A full package of drawings – which can be digitalized under request – along with around 3000 pictures taken during any phase of dismantling at mill are also available and part of the supply.

3. Actual status of the equipment

The PM3 and stock preparation equipment have been completely dismantled (not destructive dismantling works) and stored in 40 feet standard containers, with the exception of dryer rolls that have been transported by trucks and placed in Papcel's facility.

4. Location of the mill, origin of goods

Bormida mill is located in Murialdo, in the province of Savona (Italy).

Papcel headquarters is located in Litovel, Czech Republic, which can be easily reached by Wien or Prague international airports.

All goods herein described are of legally property of Papcel.

5. Main characteristics of PM3

Construction year and installation	Completely rebuilt in 1993 – 1994 / many parts from 2002 - 2004
Manufacturers	Metso, KMW, Over Meccanica, Toscotec, Maule, GS Meccanica
Mill shut down	2011, December
Status of the machinery	Completely assembled and serviced (no missing parts)
Type of machinery	Fourdrinier
Machine hand	Right (drive on the right side when looking the reel from head-box)
Paper grade	Linerboard (Test-liner) – double layer sheet structure
Basis weight range	100 – 200 gsm
Raw material	Mixed waste paper
Wire width	2860 mm
Paper width at reel	2560 mm
Paper width at winder	2510 mm
Design mechanical speed	360 mpm
Max. operating speed (with size press)	300 mpm
Max. operating speed (without size press)	350 mpm
Max. production (with size press)	100 MTPD (effective)

Max. production (without size press)	150 MTPD (design) 130 MTPD (effective)
Brief description of PM3 line	Air cushioned head-box, Fourdrinier wire section (bottom layer), mini Fourdrinier wire section (top layer) completed of secondary air cushioned head-box, press section (1 st , 2 nd and 3 rd press), pre-dryer section (two tier type, single and double felted), inclined size press (pond type), post-dryer section (to tier type, double felted), reel (without automatic reel spool loading), two drum winder, spare parts.
Dimensions of the building (PM2 and PM3 in the same location)	75 m (length) - 13 m (height) - 18 m (width)
Tension and frequency at mill	380 V – 50 Hz
PM drive	AC
Stock preparation system drive	AC

6. PM3 consumptions

Electrical energy	0.45 kWh/kg of paper
Total installed power	2.8 MW
Saturated steam	1.5 kg/kg of paper
Steam generation plant	9 T/h
Fresh water	10 dm ³ /kg of paper

7. PM3 line, description of the supply & services

The supply includes the following items:

1. PM3 approach flow systems (paragraph 10.1);
2. double layer paper machinery (PM3) for linerboard (Test-liner) and related auxiliary systems (paragraphs 10.2 – 10.10);
3. two drum winder (paragraph 10.11);
4. Simeoni „Easy Float“ water clarifier (installed in 2002);
5. main spare parts for PM3 (paragraph 10.12);
6. common stock preparation system for PM2 and PM3 (paragraph 11);
7. non destructive dismantling service (paragraph 15).

The items (1 – 6) are supplied with the “**as standing where standing**” formula.

Mechanical reconditioning and the other services (see paragraph 9) are available upon request. The shipment term is EXW (Ex Works) Papcel a.s., Litovel Czech Republic.

8. Exclusions

The following items are excluded from our scope of supply:

- steam generation plant (BTZ fuel, low sulphur level, very old and to be replaced);
- (2) double girder cranes serving PM3 (6.0 and 6.3 Tons);
- transportation service (from Papcel to customer's site), EXW Papcel;
- parts in concrete material (with the exception of shafts, impellers and agitators that have been dismantled);
- (1) sizing applicator roll 600 mm diameter, rubber covered (see paragraph 10.12.);
- (1) „RCM“ Rotocleaner rotor TS-1000 type (spare part to be directly paid to „RCM“, Italy);
- (1) Kr85 radioactive source incapsulated in titanium metal box (disposed already);
- items having the indication „scrapped“ (parts disposed during dismantling works);
- items reported in **paragraph 9** („Additional services available upon request“).

9. Additional services available upon request

Services that Papcel a.s. can generally offer to Buyers are the following:

1. consultancy;
2. business plans (feasibility studies and ROI);
3. civil and process pre-engineering for buyers;
4. transportation to Buyer's facility;
5. civil and process engineering;
6. paper machinery mechanical refurbishing;
7. provisioning of new PM parts and section's rebuild;

8. provision of new stock preparation equipment;
9. furnishing of PM auxiliary systems;
10. furnishing of starch preparation systems (engineering and equipment);
11. project management;
12. assembling on site (supervision);
13. start-up and personnel training;
14. furnishing of spare parts;
15. trouble shooting;
16. finance (medium terms suppliers' credits);
17. joint-ventures (applicable under certain conditions only).

10. PM3 & Winder technical specification

10.1. Approach flow system (top and bottom layers)

The bottom line (main Fourdrinier) is composed of:

- (1st) stage of (5) „Palmac“ low consistency cleaners, P300 type (year 1994), scrapped;
- (2nd) stage of (2) „Palmac“ low consistency cleaners, P300 type (year 1994), scrapped;
- low consistency pressure screen for head-box protection („RCM“, EPV1250-n type, year 2001).

The top line (mini Fourdrinier) is composed of:

- (1st) stage of (5) „Palmac“ low consistency cleaners, P200 type (year 1994), scrapped;
- (2nd) stage of (2) „Palmac“ low consistency cleaners, P300 type (year 1994), scrapped;
- low consistency pressure screen for head-box protection (Black Clawson, year 1994).

Type of approach flow systems: single dilution.

10.2. Primary head-box (bottom layer)

Primary head-box having the following main characteristics:

- designed, manufactured and installed by „KMW“ in 2002;
- closed, pressurized with air cushion;
- equipped with circular tapered manifold (with recirculation pipe and balancing flow control system), tube bank, perforated plate, internal rectifier rolls and manual slice lip control;
- design speed of 600 mpm;
- design production of 9 T/h;
- in full stainless steel material;
- complete of devices for vertical and horizontal top slice regulation (flow regulation and impingement point control);
- fixed to baseplates anchored to concrete basements;
- complete of longitudinal (for Fourdrinier inspection) and transversal walkways (head-box control).

10.3. Fourdrinier (bottom layer)

Wire section designed having the following main characteristics:

- designed, manufactured and installed by „Metso“;
- in cantilever (average time for changing the wire to be around 3 hours);
- in carbon steel lined with stainless steel sheets;
- wire width of 2860 mm;
- wire length of 32500 mm;
- without wire shaking device;
- (1) fixed Brest roll 580 mm diameter, rubber covered;
- (1) forming board comprising (6) blades in ceramic material;
- (1) foil box „IBS“ comprising (8) blades in ceramic material;
- (1) foil box „Maule“ comprising (5) blades in ceramic material;
- (2) foil boxes „Huyck“ comprising (7) blades in ceramic material;
- (2) hydrofoils „Huyck“ with (5) blades in ceramic material;
- (1) low vacuum box „Huyck“ with (11) blades in ceramic material;
- (1) low vacuum box „FTK“ with (11) blades in ceramic material;
- (1) duoflo low vacuum box „FTK“ with (11) blades in ceramic material;
- (8) high vacuum boxes „Huyck“ with PE covering material („Robaglas“);
- (1) high vacuum box „Huyck“ with ceramic covering material;
- (1) sheet transfer box „IBS“;
- (1) couch roll 500 mm diameter, driven (260 kW), rubber covered;
- (1) turning roll (helper) 400 mm diameter, driven (92 kW), rubber covered;

- wire guide rolls 240 and 280 mm diameters, rubber covered;
- complete of pneumatic wire stretcher and guide roll device;
- complete of wire and rolls cleaning system;
- complete of aluminium stairways and walkways;
- multi-layer wire in synthetic material based on polyester and polyamide;
- 25% max. dryness (reached in the best paper machine condition).

10.4. Secondary head-box and Fourdrinier (top layer)

„Over Meccanica“ secondary head-box, air cushioned type, design speed of 1350 mpm, capacity of 4.5 T/h, in cantilever, full stainless steel material, installed in 1994.

Wire section having the following main characteristics:

- designed, manufactured and installed by „Metso“;
- in cantilever;
- in carbon steel lined with stainless steel sheets;
- wire width of 2860 mm;
- Brest roll 460 mm diameter, rubber covered;
- (1) forming board comprising (6) blades in ceramic material;
- (1) foil box with PE blades „Robaglas“;
- (1) foil box with (5) PE blades „Robaglas“;
- (1) duoflo low vacuum box „FTK“;
- (2) high vacuum boxes „Huyck“ with PE covering material „Robaglas“;
- (1) wire roll 460 diameter, rubber covered;
- (3) wire guide rolls 330 mm diameter, rubber covered;
- (1) driven roll 660 mm diameter, rubber covered (92 kW);
- complete of pneumatic wire stretcher and guide roll device;
- complete of wire and rolls cleaning system;
- complete of aluminium stairways and walkways;
- multi-layer wire in synthetic material based on polyester and polyamide.

10.5. Press section

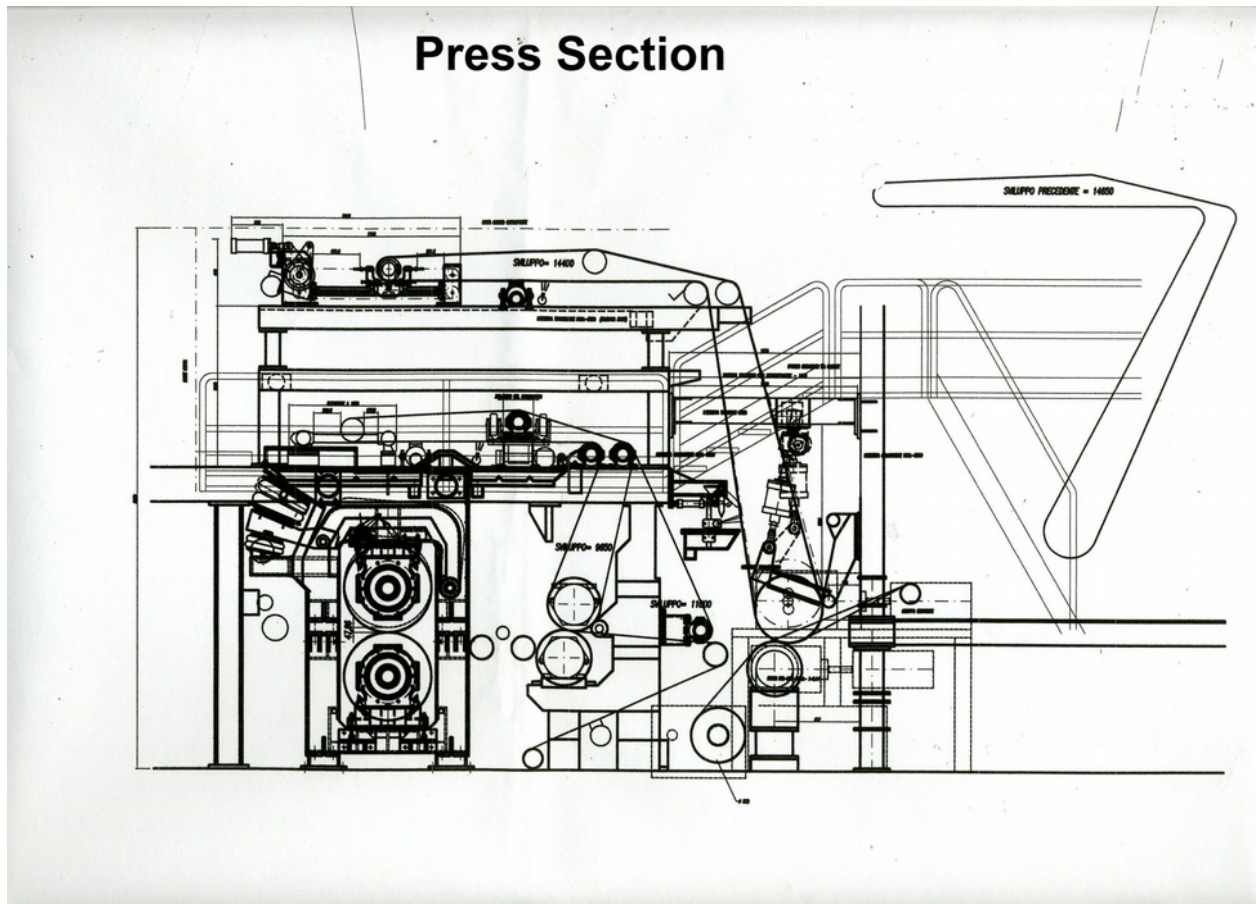
Press section having the following main characteristics:

- designed, manufactured and installed by „Maule“, „Over Meccanica“ and „GS Meccanica“.
- (1) felted lump-breaker roll 690 mm diameter (against couch roll), plain rubber covered and pneumatically loaded (Over Meccanica);
- (1) double felted 1st press with 590 mm diameter rolls, plain rubber covered and loaded by pneumatic system (Maule);
- (1) top unfelted Jumbo press with 880 mm diameter roll (2nd press), plain rubber covered and loaded by pneumatic system (GS Meccanica);
- (1) bottom single felted Jumbo press with 880 mm diameter roll (2nd press), blinded drilled rubber covered and loaded by pneumatic system (GS Meccanica);
- cantilevered press framework in painted carbon steel;
- complete of felt conditioning system;
- complete of pneumatic felt stretcher and felt guide device;
- felt based on high-tech textiles (polyamide 6 and polyamide 66);
- 45% max. dryness (reached in the best machine conditions);
- maximum linear pressure of 1st press to be 90 kN/m;
- maximum linear pressure of 2nd press (Jumbo) to be 240 kN/m.

The felted lump-breaker press (lump-breaker against the wire couch roll) is not a very common configuration, but it is effective in gaining a few additional percentage dryness points saving power consumption (no suction couch roll). This press is to be considered as part of the wire section.

Press section sketch

Note: this sketch comes from the mill and it is not very precise (updated).



(PM3, press section)

10.6. Pre-dryer section

(1) single felted pre-dryer battery and (2) conventional double felted pre-dryer batteries composed of:

- (11) cast iron dryer cylinders 1250 mm diameter, 2750 mm of roll face, 2.5 bar steam pressure (year 1994);
- (8) steel dryers „TT Steel Dryer“ (Toscotec S.p.A) 1500 mm diameter, 2900 mm of roll face, 10 bar steam pressure, with plain heads directly welded on the dryer's shell (year 2000);
- felt rolls 280 and 340 mm diameter, rubber covered;
- cast iron framework (painted);
- driven by open gearboxes (drive side);
- dryers equipped with static syphons;
- dryers certified in accordance with Italian regulation (ISPESL certification);
- complete of felt stretcher and felt guide device;
- complete of felt conditioning system;
- complete of fixed doctors manually loaded (blades in composite material, glass fibre);
- complete of rope threading system;
- centralized lubrication system for dryer's bearings;
- dryer fabric made from polyester based polymer derivates.

10.7. Size press

Superficial application of starch by Size press having these main features:

- inclined, puddle type (flooded nip);
- designed, manufactured and installed by „Toscotec“ in 2000;
- (2) sizing applicator rolls 600 mm diameter, rubber covered;
- framework in carbon steel;
- complete of rope threading system;
- complete of stairway and walkway in aluminium material;
- complete of starch preparation system (see paragraph 10.10);

Note: starch is also applied by mass in order to improve the paper runnability (> efficiency).

10.8. Post-dryer section

(1) conventional double felted pre-dryer section composed of:

- (2) cast iron dryer cylinders 1500 mm diameter, 2900 mm of roll face, 3.5 bar steam pressure (year 2000);
- (6) steel dryers „TT Steel Dryer“ (Toscotec) 1500 mm diameter, 2900 mm of roll face, 10 bar steam pressure, with plain heads directly welded on the dryer's shell (year 2000);
- first post-dryer cylinder with superficial chrome application;
- felt rolls 340 mm diameter, rubber covered;
- cast iron framework (painted);
- drive by open gearboxes (drive side);
- dryers equipped with rotary syphons;
- dryers certified in accordance with Italian regulation (ISPESL);
- complete of felt stretcher and felt guide device;
- complete of felt conditioning system;
- complete of fixed doctors manually loaded (blades in composite material, glass fibre);
- complete of rope threading system;
- centralized lubrication system for dryer's bearings;
- dryer fabric made from polyester based polymer derivates.

Note

In the pre-dryer and post-dryer sections there are (65) felt guide rolls totally.

10.9. Reel

Conventional reel drum having the next coming features:

- designed, manufactured and installed by „Over Meccanica“ in 1994;
- framework in painted carbon steel;
- mounted on painted carbon steel frameworks (height of reel section in accordance with safety regulations);
- primary and secondary arms pneumatically loaded;
- (1) drum of 1000 mm diameter;
- (11) reel spools of 250 mm diameter (see paragraph 10.12);
- max. wounded roll diameter of 1400 mm;
- rails designed to accommodate (1) finished roll with running reel;
- complete of stairway and walkway in painted carbon steel material;
- complete of safety protections (to be modified, not in accordance with safety regulations);
- without reel spool loading (the double girder crane is used for changing the reel spool);
- manual tape turn-up for reel spools change.

10.10. Miscellaneous

- Closed pre-dryer and post-dryer section **hood** designed and manufactured by the Italian „Novimpianti Drying Technology“ in 2000 (top part scrapped, right side missing).
- „Novimpianti Drying technology S.r.l.“ **heat recovery system** for closed hoods (equipment for per-dryer section scrapped).
- „Novimpianti Drying technology S.r.l.“ **steam and condensate system** (cascade configuration) designed and installed in 2000 (scrapped).
- „Fomat Automation“ **QCS system** installed in 2007 (without radioactive source, see paragraph 17).
- (1) **oil lubrication station** for dryers (scrapped).
- **Vacuum system** composed by „Azmecc“ vacuum pumps types AL65 (160 kW), ALZ80 (90 kW), ALZ100 (110 kW) and (2) Metso centrifugal fans of 1800 Nm³/h and 450 Nm³/h (fans not included in the supply).
- **Compressed air system** comprising (2) compressors „Pneumofore“ UP 12 type (7.5 bar) and UP 18 type (8.5 bar) servicing all consumptions (UP 18 compressor not included in the supply).
- **Enzymatic conversion cooker** „Amylum“ for native starch application installed in 1998 (storage tanks have been scrapped).
- PM3 is equipped with a **concrete couch pit** (with longitudinal shaft impeller) under the main wire section and **(1) UTM pulper** under the reel section made in stainless steel material („RCM“ SF1100 type, year 1994).

- (2) **Dry type transformers** KVA 1600 manufactured and installed in 2007 by the Italian company „T.E. Trasformatori Elettrici“, Bernate Ticino (Milan) having tag numbers 1520 and 1521 (primary voltage of 15 kV, secondary voltage of 400 V).
- (1) **Voith press** (never used) for sludge de-watering (scrapped).

10.11. Winder

Winder having the following main characteristics:

- designed, manufactured and installed by „Over Meccanica“ in 1994;
- two drum type;
- (2) drums diameter of 400 mm;
- installed power of 110 kW (drums);
- framework in painted carbon steel;
- maximum speed of 800 mpm (2.3 times the machinery speed);
- maximum operating paper width of 2560 mm;
- maximum parent roll diameter of 1400 mm;
- maximum finished roll diameter of 1400 mm;
- mechanical brake on the unwind station;
- (2) knives for trimming edges, manual positioning;
- TNT control (tension, nip load and torque);
- completed of trims removal system.

10.12. Main spare parts

List of main spare parts:

- (1) turning roll (helper) 400 mm diameter, rubber covered;
- (1) sizing applicator roll 600 mm diameter, rubber covered (at „RIF“, to be separately paid to „RIF“);
- (1) bottom single felted Jumbo press with 880 mm diameter roll, blinded drilled rubber covered;
- (1) fixed Brest roll 580 mm diameter;
- (2) 1st press rolls having 590 mm diameter, plain rubber covered;
- (11) reel spools of 250 mm diameter;
- (32) wire and felt rolls;
- (2) „Cristini“ felts for the felted lump-breaker press (main wire section), Duraseam type, 14500 X 2930 mm;
- (1) „Cristini“ felt for 1st top press, Duraseam type, 13100 X 2800 mm;
- (1) „Binet“ felt for 2nd bottom press, Duraseam type, 13100 X 2800 mm;
- (1) „Marone“ felt Unirun for the 1st pre-dryer battery, Unicover type, 25300 X 2750 mm;
- (1) „Marone“ felt Unirun for the 1st pre-dryer battery, Unicover type, 25200 X 2750 mm;
- (1) felt Unirun for the 1st pre-dryer bottom battery, 25200 X 2750 mm;
- (2) „Marone“ felts for the 2nd pre-dryer bottom battery, Monomesh type, 18200 X 2750 mm;
- (1) „Marone“ felt for the 2nd pre-dryer bottom battery, Monomesh type, 18200 X 2800 mm;
- (1) „Ippolito Pisani“ felt for the 2nd pre-dryer bottom/top battery, 18200 X 2800 mm;
- (1) „Marone“ felt for the 2nd pre-dryer bottom/top battery, Monomesh type, 18200 X 2800 mm;
- (4) „Marone“ felts for the 3rd and 4th pre and post dryer bottom/top battery, Monomesh type, 28600 X 2800 mm;
- (1) „Marone“ felt for the 3rd and 4th pre and post dryer bottom/top battery, Monomesh type, 28500 X 2800 mm;
- (1) „Marone“ felt 28500 X 2800 mm;
- (1) „Cristini“ bottom wire (main Fourdrinier), 35930 X 2860 mm;
- (1) „Huyck“ top wire (top mini Fourdrinier), 14730 X 2880 mm.

11. Stock preparation system

There is a common stock preparation feeding both PM2 and PM3 for a total production of around **200 BDTPD**. The system does not include the PM2 and PM3 approach flow equipment which are part of the respective machinery.

Our supply includes all the stock preparation goods (for PM2 and PM3).

The system has been designed to work with 100% secondary fibre (mixed waste paper).

Along with the description, please have a look at the stock preparation flowsheet (separate dwg file). The companies which have provided the stock equipment are: „Black Clawson“, „RCM“, „Comer“ and „Inox BF“.

11.1. Brief description of the existing process

11.1.1. Pulping and de-trashing

The „Black Clawson“ Hydra-pulper of 50 m³ (F50 type) in AISI 316 stainless steel material and installed power of 360 kW (7 kW/m³) is loaded with mixed waste paper by a belt conveyor („Mericostruzioni“, length of 15 m, width of 1.4 m and 16% slope) and water forming a slurry of medium consistency (5.0 – 6.0% TSS) which is continuously discharged after up to 16 minutes pulping time through the perforated plate and extraction chamber. The accepted stock is then pumped to the dumping chest of 90 m³ (in concrete, with „RCM“ agitator AT 800 type, installed in 2001) whilst solid contaminants separated by the perforated plate of the pulper are pumped into the „RCM“ Select-purge TSP 1300 type (installed in 2000) having perforated plate of 20 mm diameter and operating in batch mode. The accepted stock from the Select-purge machinery is pumped back to the pulper whilst its rejects are treated by the „Inox BF“ inclined Ecodrum whose function is to recover valuable fibres (back to pulper). Contaminants from Trommel are further dewatered by a „Inox BF“ hydraulic compacting press.

Finally, the pulping system works in a continuous/batch mode in accordance with the quantity of heavy contaminants filling the pulper that must be removed.

Some parts of the conveyor transferring the waste material into the pulper, in particular the side panels, have been scrapped due to their critical mechanical conditions.

11.1.2. High consistency cleaning

The stock from the concrete chest of 90 m³ is then pumped into (4) „RCM“ high consistency cleaners D200 type having automatic discharging system and working at a TSS consistency of around 3.5 – 4.0% (up to 5.0%). This equipment is particularly suited to eliminate heavy contaminants such as pieces of glass, metal and stones. The accepted stock is transferred to a stainless steel chest of 110 m³ equipped with „RCM“ agitator (AT 800 type) placed in 2003.

11.1.3. Coarse screening

The coarse screening plant is composed of (2) equipment working in parallel mode: (1) Ultra-screen „Black Clawson“ working at medium consistency (3.0 – 4.0% TSS), installed power of 90 kW, with basket having holes (installed in 1994); (1) „RCM“ Turbo-separator TRB 1200 type equipped with basket having holes (installed in 2002). The rejected stock from the two lines goes into a concrete chest of 35 m³ which feeds the „RCM“ Rotocleaner TS 1000 type and whose accepted stock returns back into the pulper whilst the rejected is treated by a „RCM“ vibrating screen. The accepted stock from the two pressure screens is collected in (2) concrete chests of 90 m³ each (1995). A third chest of 90 m³ in concrete is used to pump the trims and breaks directly to inclined screw thickeners feeding the mixing chest of 250 m³.

11.1.4. Fine screening

The accepted stock from the coarse screening plant is transferred to (2) medium consistency pressure screens working in parallel mode: (1) „Comer“ EC10 type having installed power of 90 kW and slotted basket (2001) and (1) „Comer“ EC20 type having installed power of 160 kW and slotted basket (2000). The rejects from the two pressure screens are transferred to the „Comer“ EC5 pressure screen having basket with slots (2001) through a concrete chest of 45 m³. The accepted stock from the EC5 returns back to the pulper whilst the rejected is treated by a vibrating screen. The cleaned stock from EC10 and EC 20 pressure screens is collected in the concrete mixing chest of 250 m³ which feeds PM2 and PM3 machine chests of 60 m³ each. It should be noted that „Comer“ EC5 type screen has been found in bad mechanical conditions and that, therefore, it has been scrapped.

11.2. Spare parts of stock preparation equipment

The spare parts (new and/or reconditioned) available at Bormida mill are:

- (1) impeller and perforated plate of „RCM“ select-purge TSP 1300 type;
- (1) basket for „RCM“ Rotocleaner TS 1000 type;
- (1) impeller for „RCM“ Turbo-separator TRB 1200 type;
- (1) rotor for „Comer“ pressure screen EC20 type;
- (1) rotor for „Comer“ pressure screen EC10 type;
- (1) rotor for „Comer“ pressure screen EC5 type;

- (3) baskets for „Comer“ pressure screen EC20 type;
- (2) baskets for „Comer“ pressure screen EC10 type;
- (2) baskets for „Comer“ pressure screen EC5 type;
- (1) basket for Ultra-screen „Black Clawson“.



(“RCM” Rotocleaner)

11.3. Proposal for stock preparation rebuild

11.3.1. Introduction

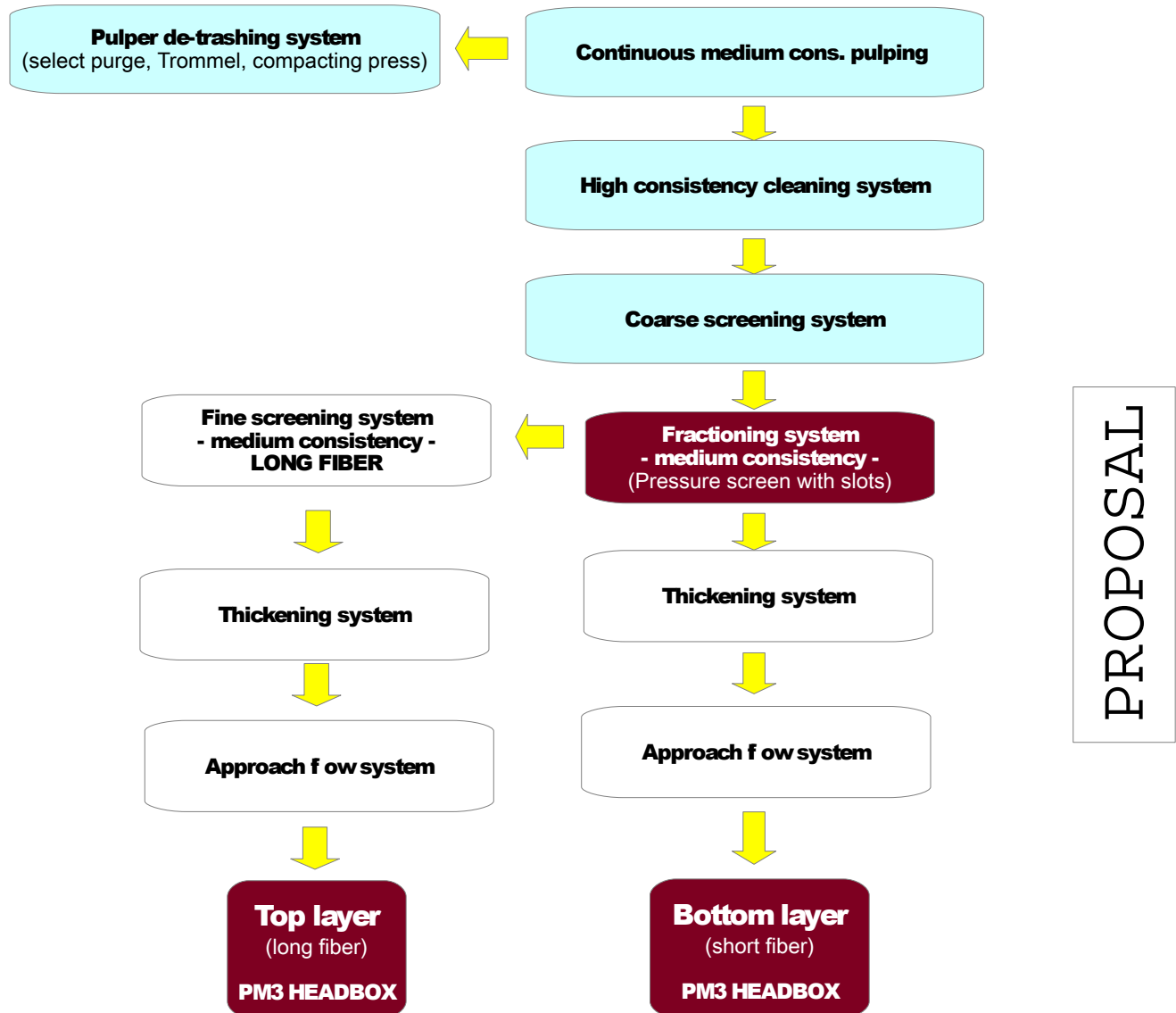
As it normally happens in paper mills that keep investing in plant and machinery to increase the efficiency of their lines and/or the quality of the paper produced, Bormida mill has undergone many rebuilds over the years. The equipment available at the mill can conveniently be reused to improve the stock preparation plant in terms of paper cleanliness and, consequently, of PM's overall efficiency.

With the existing equipment, the best stock preparation system for Bormida PM3 is represented by the flow diagram beneath (paragraph 11.3.2.).

It should be taken into consideration that the stock preparation system is able to produce around 200 TPD using 100% mixed waste paper as raw material. The plant is then oversized in respect to the maximum production of Bormida PM3 (130 TPD).

11.3.2. Block flow diagram

Only the technological processes have been reported (no intermediary and/or mixing and machine chests).



12. PM3 mechanical conditions

PM3 was almost completely rebuilt in the years 1993 – 1994 with some parts supplied as new in 2004. A paper machine aged 20 years should still be considered capable of producing paper for a long time (at least for another 20 years). Nowadays, paper machines originally dating from 1965 are successfully being sold by European mills and relocated in foreign countries, especially in fast growing economies, which leads to the conclusion that Bormida PM3 should be considered recent machinery.

All PM parts in stainless steel such as head-box, wire section, mini wire-section and secondary head-box are in very good condition (no trace of superficial corrosion by aggressive chemical agents).

Some parts of the press section framework should be cleaned, subject to sand blasting and repainting even if there are no visible signs of deep corrosion.

Stairways and walkways in aluminium material are also in very good conditions.

The pre-dryer and post-dryer cast iron frameworks are in good conditions.

The reel section staircase and walkway is to be cleaned and painted; its safety protections are to be designed and manufactured as new, the present ones do not meet any safety regulations. New safety protections are recommended for the winder.

The PM3 is complete with all components, there are no missing parts that have been stolen (with the exception of wire cables), completely or partially dismantled or damaged (with the exclusion of electric cabinets). Control system for the PM (DCS/PLC) and MCC must be

purchased as new. All pipes, with the exclusion of those having diameter equal to or larger than ND 200, have been scrapped (hardly reusable in a new PM's configuration) along with chests. In general, it would be advisable to refurbish the machinery before its installation in order to avoid continuous maintenance (shut downs) during production (> PM overall efficiency).

13. PM3 technology overview

Declaring beforehand that any paper machinery should be evaluated in respect of the buyer's requirements and perspectives, PM3 of Italian Bormida mill is still to be regarded as machinery of very good technology, especially concerning the structure of the forming sheet. In detail, the press section – regardless of what the paper dryness rate might be before entering the pre-dryer section – is characterized by narrow and extended nips which positively affect bulk and, consequently, the paper resistance to be folded. The third press is a „mini Jumbo“ as the diameter of rolls is 880 mm only. In order to obtain a very extended nip pressure, Jumbo rolls having 1500 or 1800 mm diameter should be used or, as a better alternative, an ENP press (shoe press characterized by linear pressure up to 500 kN/m).

The wire section, composed of a main Fourdrinier (bottom layer) and a secondary Fourdrinier (top layer) are still of the latest technology for linerboard grades produced on machinery having speed up to 1200 mpm.

Pre-dryer and post-dryer sections are of conventional type, two tier double felted. In this specific case, the open gearboxes on the drive side improve the humidity profile of the sheet throughout its width. Doctoring is performed with manual doctors equipped with blades of the latest design. Both the pre-dryer and post-dryer sections are equipped with a certain number of steel dryers with plain heads directly welded on shells „Toscotec“ design. This solution has two remarkable advantages: a) better humidity profile at paper edges; b) higher drying capacity.

„Toscotec“ inclined size press – puddle type – is still used today with great success even though a film press would generally reduce the post-dryer section length as it works with a significantly higher concentration of solids (less water to evaporate). Nevertheless, considering the speed of Bormida PM3 machine, the puddle type size press is still good machinery where the surface application (gsm on both sides of the sheet) of starch (or any other sizing substance) is controlled by mechanical nip pressure of applicator rolls, by pond height (hydrostatic pressure), by starch concentration and base paper properties. The inconvenience of the inclined type is the non uniformity of starch application of both sides, but if this does represent a not negligible problem the size press can be equipped with (1) applicator roll of bigger diameter. The last consideration is that size presses contribute to production losses for about 20 – 25%, therefore its usage should be properly evaluated (it is advised to by-pass it).

PM3 reel section is a classic drum type which can be implemented with the automatic reel spool loading.

The two drum winder - „Over Meccanica“ design – is fine with 1400 mm diameter parent roll.

The unwind station is operated manually (tension provoked by the two drum rotation and brake on the unwind section) and for packaging grades the slipping roll inertia compensation obtained by a regenerative electric motor is not required.

14. Pictures and other documents

Documents available upon request:

- low resolution pictures (separate zip file);
- PM3 elevation drawing (proposal for PM3 rebuild, Metso Paper);
- stock preparation system (dwg file);
- paper samples (at Papcel's headquarters);
- a package of around 50 Kg of drawings (hardcopies), lists and/or manuals – now stored in **Papcel a.s.** - will be delivered to the Buyer after signing of sale contract along with around 3000 pictures that have been taken during the dismantling works at Bormida mill.

Note

- On PM3 elevation drawing (proposal for PM3 rebuild, Metso), the actual configuration of the machinery is the one shown on the bottom of the sheet, with two exceptions: a) the Jumbo press (red colour) has been ordered to the Italian manufacturer „GS Meccanica“ and the diameter of top and bottom rolls is 880 mm; b) the reel section has been provided by the Italian „Over Meccanica“ and it is without the automatic spools loading system.

15. Dismantling works

The dismantling works has been completed, all goods are now stored in Papcel's facility. The non destructive dismantling has included the following services:

- equipment cleaning, tagging and match-marking;
- photographic documentation (around 3000 pictures);
- packing of all dismantled parts;
- packing lists;
- containers loading;
- loading of containers onto trucks.

The company which has provided us with the above is the Italian „Proinvar S.r.l“ having a remarkable experience in the paper industry and knowledge of the paper production processes.

16. Additional expenses for the Buyer

(Not applicable anymore, there are no additional expenses)

17. Notes

- Papcel a.s. has purchased Bormida PM3 with the aim of reinstalling it by one of its customers or, alternatively, to reuse most of PM parts as integration to new supply. The „Used Machinery Division“ of Papcel a.s., which is managed by the writer, provides the company with outstanding machinery for sale that are on the market, therefore this operation should be considered as part of Papcel a.s. „core business“.
- „Fomat“ QCS system is not completed of radioactive source Kr85 incapsulated in titanium metal (disposed by Campoverde S.r.l, Italian company specializing in special waste disposal).
- The selling price of goods, which will be disclosed separately along with the other commercial conditions, has been fixed taking into consideration the market value of the machinery, its technology, mechanical conditions, repairs, parts to be provided as new and dismantling services (completed already).
- This document is accurate in its content, parts here described that should not be available, for any reason, will be paid back by bank guarantee of 5% of sales contractual price.

18. Legal notices

- We declare that the equipment mentioned in paragraph 7 (PM3 line, description of the supply & services) is the property of Papcel a.s. (a copy of the official documents will be delivered on the signing of the contract).
- If agreed by written contract, intermediaries are entitled to keep the exclusive contacts with potential Buyers and propose a selling price. But it is here declared that dealers **do not have** the right to undertake any kind of legal obligation (i.e., acceptance of offers and commercial conditions from the Buyer) on behalf of Papcel a.s. with third parties.
- Papcel a.s. is entitled to **freely reject** any offer from Buyers or proposed by intermediaries that are not in accordance with Papcel a.s. sale policy.
- The people having legal power to finalize any sale contract with Buyers are, if not otherwise specified, the following: **Mr. David Dostal** (sole shareholder and CEO of Papcel a.s.), **Mr. Claudio Giannone** (Used Equipment Manager of Papcel a.s.), or any other person having *power of attorney*.
- Any modification of this document by any party – Papcel a.s. excluded - is forbidden and liable to prosecution.

19. Contacts



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(PM3, wet section)