



A STEP FURTHER...

After having equipped the inverters with film capacitors and ONE Regulation Board - "one fits all" – now we pass to the liquid cooling. The advantages are: Reduced spaces, no fans on drive as well as no conditioning areas, absence of dust contamination-humidity in acid environment, preserving guaranteeing through time an important energy saving.

SAELsrl. ERMOLLI papermill

by: **Paolo Andrichetti, BU paper, SAEL**

In the name of the continuous spirit for innovation, Ermolli Paper mill has reconstructed the drives of PM3 machine, installing drives with liquid cooling conceived and realized by SAEL, found for the second time in Europe in paper mill application.

Ermolli is the European leader in paper for food packaging and special papers. Actually, the paper packaging, recyclable and compostable, is more and more used instead of plastic materials and aluminum. To pursue its mission on offering the best quality product to the market, focuses the investments on research and innovation. The extreme manufacturing flexibility, and the prime product quality, pushed this historical Brand to become the benchmark for everybody.

The Moggio (UD) Plant area benefits from very pure water, as well as renewable energies (30% of its needs comes from the hydroelectric energy); nearby the most important harbor used for paper hub, and well

served by the highway infrastructure. The Plant produces over 60.000 tons of paper per year with three production lines: Food paper films, printable papers and special papers, upon demand, with minimum batches very appreciated by its customers. Thanks to the best "on-

line" and "off-line" control systems, the Paper Mill offers high quality standards and flexibility.

The Lines in papermill:

MC1: Variable grams between 25 and 180gr/m. Having a particular



The inverters of the "PLATFORM ONE DRIVE WATER" series, equipped with ONE card (single card for all types of DC-AC and REBORN drives) and Film capacitors, guarantee an infinite life of the inverter.

surface treatment system, the line can produce special papers either for film-forming solutions, or patina with high solid contents.

MC2: Variable grams between 18 and 35gr/m. Produces light papers used, for example, on food industry and hygienical care.

The newest MC3: Variable grams between 25 and 180gr/m. Is equipped by a last generation patina system (BAT) who allows the best performance ratio within energy savings.

The final paper operations are made using advanced technology machines: beside the continuous lines, there are two wetting machines, four hot supercalanders (heated by high temp steam) and four winders. In order to guarantee corporate standards, and the market demands,



after having realized with SAEL the reconstruction of the Pm1 and PM2 drives, have also awarded to SAEL the rebuilding of PM3, this time installing drives of the latest generation liquid

cooled that guarantee the maximum energy savings.

**SAEL AND INNOVATION:
PLATFORM ONE DRIVE
LIQUIDCOOLED**



Turbo film Sizer , Dry area ERMOLLI MC3



DRY ZONE MOTORIZATION – CALANDER AND POPE. ALL THE MOTORS HAVE BEEN SUPPLIED

Fulfilling our mission voted to the “Spirit of Improving”, we applied the know-how achieved along the Tunnel Boring Machines experience, to our massive production drives. The working environment in which our inverters work in this sector, are among the most severe that can be encountered: very small spaces, strong vibrations and high temperatures due to the fact that they are placed in the vicinity of the eight 400Kw engines that carry out the

rotation of the main drill, have driven our research and development team to create a water-cooled drive, extremely reliable, compact and strongly immune to thermal and mechanical shock; applied in well-protected environments such as the paper mill, just a few months after start-up, it allowed us to sleep peacefully and to encourage massively the paper mills to be led towards this technology.

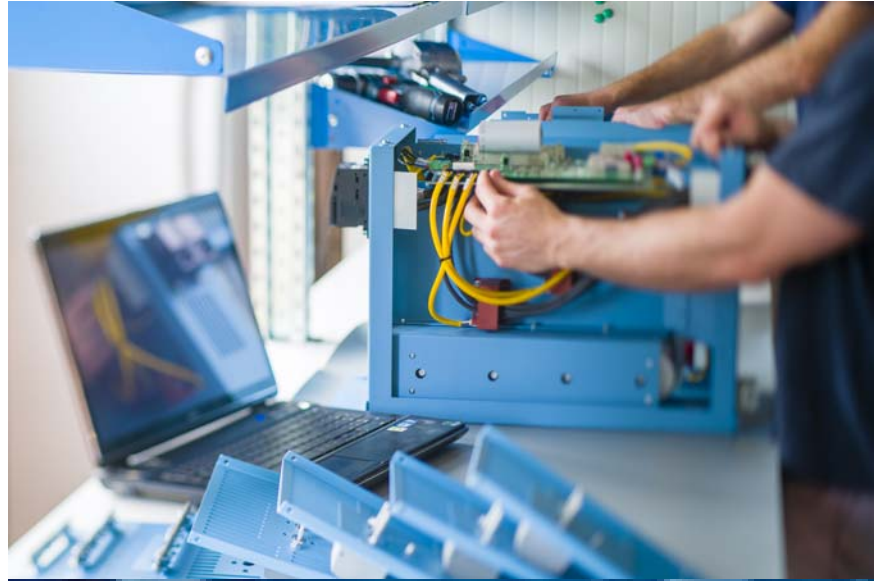
Our liquid cooled drives, practically without tangential fans (one each inverter), allowed us to remove all the ventilation normally mounted on every door of the electrical cabinet. The new electrical cabinets, where our panels are installed, today become normal rooms, since the system becomes independently cooled. The double-sided electrical panel, where the inverters are mounted,

THE TECHNOLOGICAL GAP



The only regulation card that is the same for all our convectors DC-AC-BRUSHLESS-CHOPPER and REBORN (system that recovers all DC drives of any model) of the “PLATFORM ONE DRIVES” series.





WATER COOLING Inverters highlights – The “PLATFORM ONE” Exclusively made by SAEL

have closed air recirculation ensuring no contamination of duct, humidity and air acidity; they preserve over time, and in a perfect manner, electronic, electromechanical and

other various components, The experience gained on the subject by the Tunnel Boring Machines and the excellent performance monitored over the years due above all to

energy saving, will allow the paper mill to save a lot of money per year, eliminating the need for maintenance of the air conditioners and fans. For this reason, and for the significant



ERMOLLI MC3 Drive Machine – Double front Electrical Cabinet with inverters and water cooling



ERMOLLI MC3 - Wet zone of the PM3



ERMOLLI PM3 - Dry Zone and the finish congratulation

reduction of the dimensions that the system has obtained, driven by the continuous research of innovation of Cartiera Ermolli in the research for products and systems with high technology and energy saving, we have made the second WATER COOLING paper mill plant in Europe. Thanks to the Teamworking – SAEL and Cartiera Ermolli – we started the Machine in a bunch of days including the motor supply. The job involves 45 a.c. motors (up to 2,5Mw installed) and our PLATFORM ONE DCS in Drive.

THE MC3 JOB INSIGHTS:

To apply this important technical machine revolution who took almost a month – including the civil structures - the MC33 machine drive, formerly made on 2016 by ourselves, has been totally rebuilt. From today on, the production is doubled.

The Sael and Ermolli Teamwork developed this important and ambitious project in the respect of the full safety.

The electrical cabinets have been changed; the pulpers re-designed applying three new 15" panels and DCS Stations inside the Control Room equipped by our latest “DCS in Drive” for the drives management.

Another milestone of our “PLATFORM ONE DRIVE” philosophy is the newest 2020 powerful “DCS in Drive” Controller, who stores and shows the trends of any operation, as well as existing variable and machine status. A Real engineering station, fully programmable, that controls every single Drive, existing Hw and PLC linked to the network.



Eng. Agostinello and Moia during the final adjustments of the job

Since the beginning the Customer felt and touched the performance of this powerful innovative Station. The Technical Management said: “ The “WATER ONE”, together with the “DCS in Drive” by SAEL gave us a significant production increase and, last but not least, a better consciousness of our machine”.

Thanks to the “DCS in Drive” it is possible to analyze control the entire process, working via Remote – with IWSA Internet Worldwide Sael Assistant - . Another important added value of SAEL is the technical support, the training and the system flexibility who allowed to take in place the job in few days only.



Water exchangers with direct in-let from the source, used to cooled the inverters and the electrical equipments.

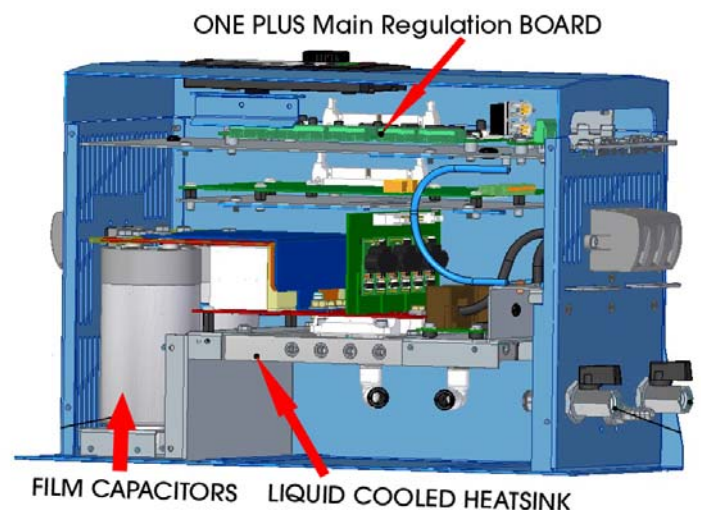
Liquid-Cooling Drive -WATER ONE Drive Series-

**ALL THE DRIVES ARE
EQUIPPED WITH FILM
CAPACITORS**

Infinite life of inverter



**High Efficiency
SAVE MONEY
and
SPACE**



ONE PLUS Main Regulation BOARD

FILM CAPACITORS LIQUID COOLED HEATSINK

SAEL BOX:

Paper Mill specializations:

Born in 1987, Sael offers Integrated Systems and Process Controls for Industrial Automation. Within our mission, **Customers First.**

SAEL was awarded the title of tailor maker for any automation system. SAEL is now a leader in the Paper Industry.

The big technical imprinting allows us to offer custom solutions: from Heavy Duty up to the General Purpose. For the Paper Mill Industry, especially, SAEL offers highly sophisticated and innovative technical solutions.

Hardware and Software custom solutions for any customer needs. Beside the complete new equipment production, there is a focused Team who works on re-engineering – most of the time saving a lot of existing components like the original power section or electro mechanic parts and so on. The main application they are working on are: Sectional Drives with DC, AC and Mixed Technology; Motors



implementations; In-line / Off-line Coating machines; Analogical to Digital cascades conversion; Stock preparation by PLC or SAEL technologies; Rewinders and

Slitters with cutting units and frame position; Winders and Unwinders; DCS and QCS controls, close our experience in paper Industry



The “PLATFORM ONE DRIVE” Inverter is made for Paper Mill Industry. They are the most innovative solution in the market. Their mission is the long life, and easy to be repaired; flexible and easy to drive. All our drives are equipped by the ONE Card – A Single board fits all the drives: DC, AC, Brushless and Reborn -, Film capacitors for a long life inverter.

