

Lamina® technology is at the cutting- edge of the ceramics field

Fresh out of the SYSTEM Ceramics' Research and Development lab comes LAMINA®, technology innovation at its best for ceramic applications, an ultramodern process line supervised by the new generation of Movicon 11 software.

System Spa went into operation in 1970 in Fiorano Modenese, under the supervision of the company chairman Franco Stefani.

Due to the continuous growth in popularity in tile décor sector the company launched the first rotary screen printing machine called Rocket in 1971 which evolved into the now worldwide famous Rotocolor®technology. As time went by the company discovered and took action in other interesting opportunities in the logistics and technology sectors. It soon expanded to become one unique enterprise comprised of four different divisions, System Ceramics, System Logistics and System Electronics covering an industrial

area of 120,000 square meters comprised of plant systems and research sectors for each division.

Today, System Spa is a well established organization, operating at national and international levels reaching an annual turnover of 234.5 million euro in 2007. It has over 1000 employees and a vast network of branches and vendors promoting their vast range of products and services which are constantly kept at the cutting edge due to inexhaustible research on modern market needs and trends.

Nearly 35 years in operation the first System Spa group division, System Ceramics, has

earnt international leadership in the world of ceramics by becoming a major innovator in new aesthetic and technological solutions. Today its supremacy continues with its exclusive Lamina® technology, giving life to a very innovative and versatile product called LAM'SLAB®, a multi-applicable ceramic slab. The product process line is structured on pre-assembled modules for quick installation and is built to perform 6 principle macro functions, drafting, trimming, engraving, pressing, firing and removal.

In the draft phase different raw materials from the earth are milled and prepared for the tile mixture (corresponding to porcelain stone). This earth mixture is loaded on to a conveyor belt which has independent rollers positioned at the beginning of the production line working in synchronization as the conveyor belt advances. Special sensors control the draft's length and thickness along the way.

A compactor is used in the pressing stage (with 15,000 – 26,000 ton. power) using a belt, pushed underneath by a hydraulic cylinder pressing the "impasto" on the surface of the above belt supported by a steel slab. Substantially, the pressure action is produced by a cylinder driven by a hydraulic unit. When the material exits the presser, its edges are trimmed and abrasive brushes sweep away access material which is then reused afterwards.

There are two different modalities for the decoration stage:

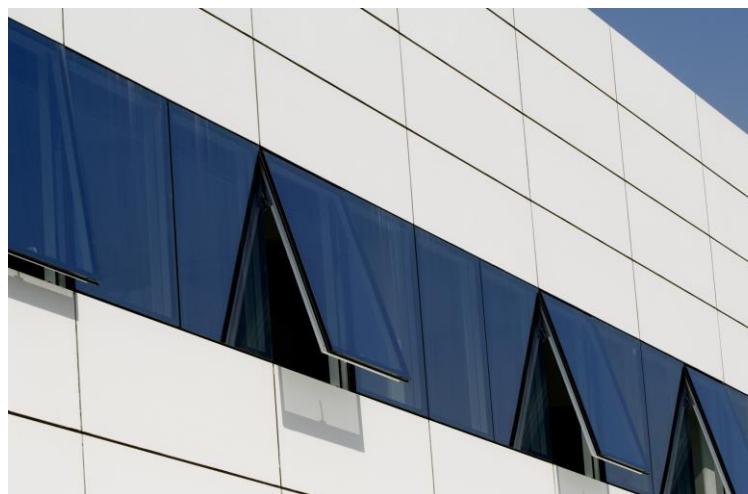
- Dry decoration, where color is applied to the whole length of the slab with a film of special material engraved with a laser.
- Moist decoration (using the Rotocolor® technology).

The final step consists of firing the slabs in a roller tunnel kiln that also works as a dryer. Being material containing very little moisture, they are quickly dried to perfection at the beginning of the roller tunnel kiln.

Removal is done by twin unloading machines with suction pad arms capable of picking up the slabs and placing them safely in special trays.

Supervision

System S.p.a. chose to use the Movicon software platform technology for controlling the entire production line with each of its single processes. The company chose to



A building covered externally with Laminan which can be applied inside, outside and used for furnishing.

invest in Movicon because they needed a technology that matched System S.p.a. principles of innovation, flexibility and modularity of use, believed to be indispensable for their particular process types.

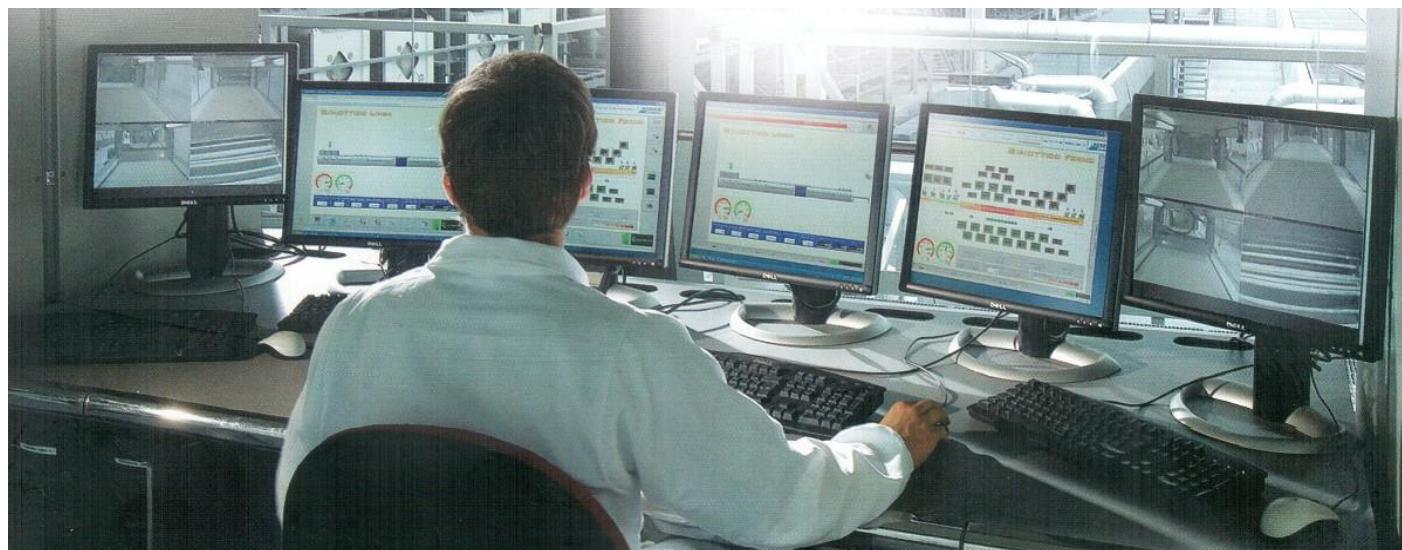
The tailored designed Movicon project is a very complex but versatile and easy-to-use Scada application. It has been fitted out with userfriendly screens designed accurately with graphics and animation that make the program simple and efficient to use for managing each production process phase accurately. The supervisors are connected to the various control units with Ethernet using the Modbus TCP protocol. The decentralized control units include PLCs, Soft PLCs and thermoregulation tools.

Due to project planning reasons it proved to be more convenient to divide supervision system into two main parts: the first dealt with production line movement while the other dealt with the kiln and logistics. The user has full control of all working parameters relating to line movement, and the part relating to the special firing tunnel kiln process (FAST FIRE), with the possibility to interact directly from their workstation by:

- Managing commands automatically and manually (switching over from one mode to the other as need be)
- Controlling Alarm history (One screen is dedicated to recording all alarm occurrences with detailed information to allow the user to monitor the

Only one operator is needed in the control center to control and monitor the entire production process globally or each single Lamina® process phase at a time, such as dosages (at the beginning), the presser, trimmer and coloring done with the Rotocolor® System and liquid engobe (at the end of the main production line).

After the pressing phase, the LAM'SLAB® product passes to the Fast Fire kiln for continuous firing. The user also controls this entire firing procedure while being able to interact with the heat regulators to make sure the right temperature is maintained throughout the whole length of the kiln. The various set-points can be filed in DB archives. Several purpose-built screens can be accessed



The entire Lamina production process can be supervised from the control room. Plant supervision is done using Movicon terminals and IP cameras distributed on an ethernet network.

- problem and react with right remedy)
- Controlling and managing energy consumptions.
- Viewing detailed charts and graphs for production reports.

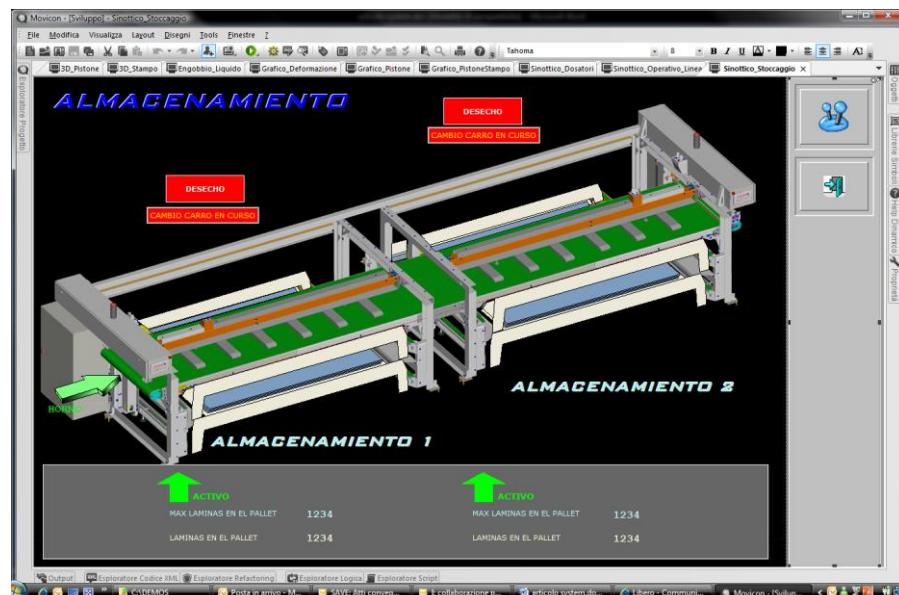
from the main screen so that values can be set for managing:

- Programmed startups
- Production runs
- Recipe Archivial
- Report management

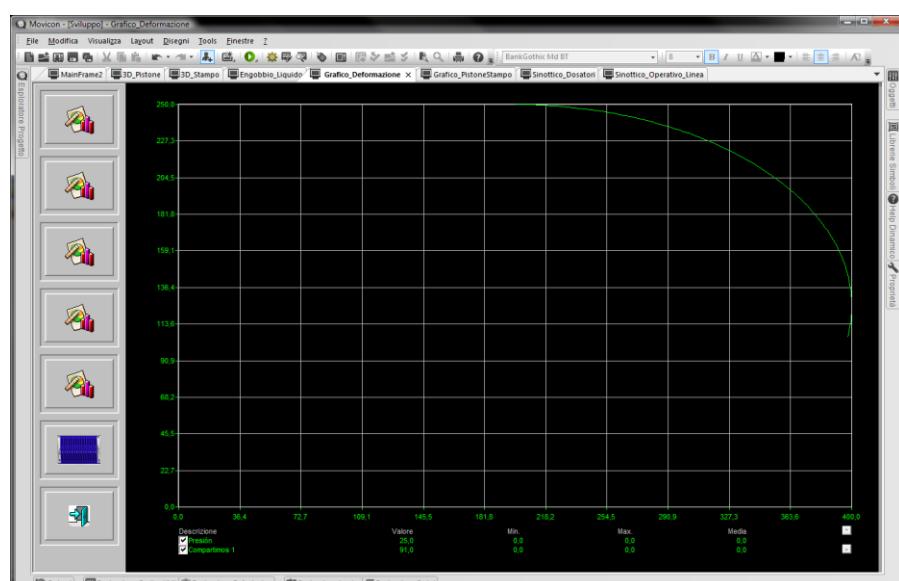
One of the many interesting features includes a screen that allows the user to easily set or modify working parameters of production line machines graphically designed on screen. The screen then simulates the production line operativity with the new machine settings to let the user see how they work and make modifications where needed before putting them into real action. Additional program features include: alarm notification by email and factory management by remote control using the web client technology. This technology permits both production managers and maintenance staff to access the system and therefore the production process, using password and Log On criteria with any internet browser. The Movicon Web Client technology is based on the multiuser and multiplatform concept made possible with Midlet and Java applet on client side. Communication is performed through the Ethernet network and can be accessed externally using the appropriate routers and firewalls.

System S.p.a's cutting edge technology is today the state-of-art in ceramic production systems, consenting innovation supremacy with patent technology in terms of producing original and unique materials such as Laminan, an unparalleled product with modern solutions responding to a vast range of different design requirements and needs to suit even the most demanding architectural assignment whether in the building sector or interior furnishings.

Paolo Zanti
System S.p.A.



A screen with showing a part of the Lamina line process in accurate detailed.



One of the Movicon graphics through which users can manage and analyse processes.