

News from SMAC for Digital Glazing Lines and Large-Format Tiles Production



Fig. 1 Tiles cooler device KRYO



Fig. 2 Ink stirrer TAGADA

Tiles cooler device KRYO

SMAC, usually at the forefront in research and development of machines and accessories for tiles glazing and decoration lines, presents KRYO as tiles cooler device to be placed in the glazing line to cut down tiles temperature and moisture before digital decoration with inkjet machines. Thanks to an innovative recirculation system with double closed cycle, KRYO ensures a uniform decoration without defects, longer life of the printing heads and deletes every problem connected with fumes emission from the processed tiles.

KRYO is an innovative system with a double closed cycle system with six blowing blades equipped with an anti-condensation device. KRYO is an "all-in-one" device which doesn't need external cooling or condensation units. In few minutes it can be installed in the production line allowing the temperature decrease of big air volumes with high speed and high prevalence circulation.

Cooling inside the device is done by two independent evaporators with a condensation removal system completed by 6 high speed fans. The cooling circuit is connected to an industrial freezing unit of condenser-compressor type integrated into the structure which allows to obtain a temperature up to -25°C of the exit air.

Thanks to the double air recycle inside the cabin, the system allows a very high cooling capacity with the guarantee of a total removal of residual moisture.

No other additional system is needed and every other single production parameter remains unchanged. KRYO can be adapted to any production type and to any external climatic condition.

The technical features of the system are:

- working power: 11/13/15 kW
- air flow delivery: up to $6000\text{ m}^3/\text{h}$
- cooling system temperature: up to -25°C
- exit air temperature: up to -10°C
- quick installation in the line
- residual steam rejection system
- independent condensation recovery

- high efficient evaporators
- three independent double fans
- freezing unit with electrofan condenser
- half-hermetic compressors
- internal insulation with high density panels
- control via colour touch screen and PLC
- max tile size: $1000\text{ mm}/1500\text{ mm}$
- dimensions: $2850\text{ mm} \times 1900\text{ mm} \times 1780\text{ mm}/3300\text{ mm} \times 2450\text{ mm} \times 1900\text{ mm}$.

Ink stirrer TAGADA

TAGADA is a device for automatic agitation of the tank ink to be placed directly in the decoration line near the inkjet digital printer. TAGADA is an economic unit, easy to use and designed to shake pigmented ceramic inks because they have the tendency to deposit during a long storage period.

In order to make the inks usable in optimal way, they can be shaken constantly automatically in order to guarantee a perfect use of the printer with a 100 % repeatability.

The device's practical design allows to load in quick and easy way up to 4 tanks by means of a self-adjustment blocking system. By pressing the start-up key, the device begins the working cycle, rotating the tanks automatically and softly, guaranteeing the ideal mixing of the pigmented suspensions and also preventing the formation of sediments in the container angles. In few minutes the ink will be ready to be used in the printer.

TAGADA is equipped with an electric command board with programmable timer to set working and pause times. The device is completed by a support frame with painted tubular, openable doors with safety micro-switches, discharging valves for washing water and a luminous tower with working/pause functioning.

Climatized inks shaker DINK

Today, the new printing technologies in the ceramic field require more and more indispensable expedients and devices to get this process more stable and as repetitive as

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possible. Mostly affected are the new ceramic inks with pigment suspensions reaching particle size distributions even lower than one micron.

These inks have chemical and physical characteristics influenced by different factors such as temperature, moisture, storage times and climatic conditions. DINK was developed to facilitate the correct ink storage near the digital printing machine, keeping the inks at a controlled and constant temperature while, at the same time, being mixed according to cycles set by the operator in order to prevent pigment sedimentation ensuring a constant coloration in time. Thanks to the innovative and patented handling system with programmable nutation movement, DINK allows agitation of big ink quantities (up to 200 kg) ensuring the maintenance of unchanged chemical-physical characteristics of the ink for a long time period allowing the operators to have always inks ready-to-use.

DINK can contain ink tanks of different shape and volume, although at the same time, thanks to the housing with drawers removable by means of a pneumatic system. The management of internal temperature is done by an air-conditioned inverter integrated system with a heat pump which allows to maintain the set temperature stable in any season and in any external climatic condition, passing automatically from the cooling to the heating mode.

The technical features of the system are:

- automatic working
- max loading charge: 200 kg
- agitation device with variable speed
- internal air-conditioned system with heat pump
- suitable for any tank type
- longer inks life
- longer printing head life
- ensures a better stability of colour tones.

D-Glaze device for glaze density control

To have constancy in colour tonalities, it is very important to have always under control the base glaze applied before digital decoration. Until now, this was done with empirical methods, often based solely on experience and manual skills of the glazing line staff.

To overcome these problems, SMAC has put on the market D-Glaze, an automatic system designed for the control of aqueous ceramic suspensions (glazes) which require to be diluted and brought to a specific density before being used by any glazing machine. Ideal for the preparation and feeding of glaze basis for subsequent decoration with digital inkjet printers, D-Glaze allows to have always the desired product amount and to maintain the set density constant thanks to its automatic control devices with continuous cycle and automatic recirculation.



Fig. 3 Climatic inks shaker DINK

The machine is designed to be adapted to the existing equipment of the glazing line, thus avoiding the need to purchase new equipment and other device accessories. The equipment is trolley-mounted for easy handling, the electronic control is performed with PLC and a colour touch-screen. When the cycle starts, the machine will fill the tank connected with the glaze to be diluted by taking it from the storage container by means of a suitable pump. At the end

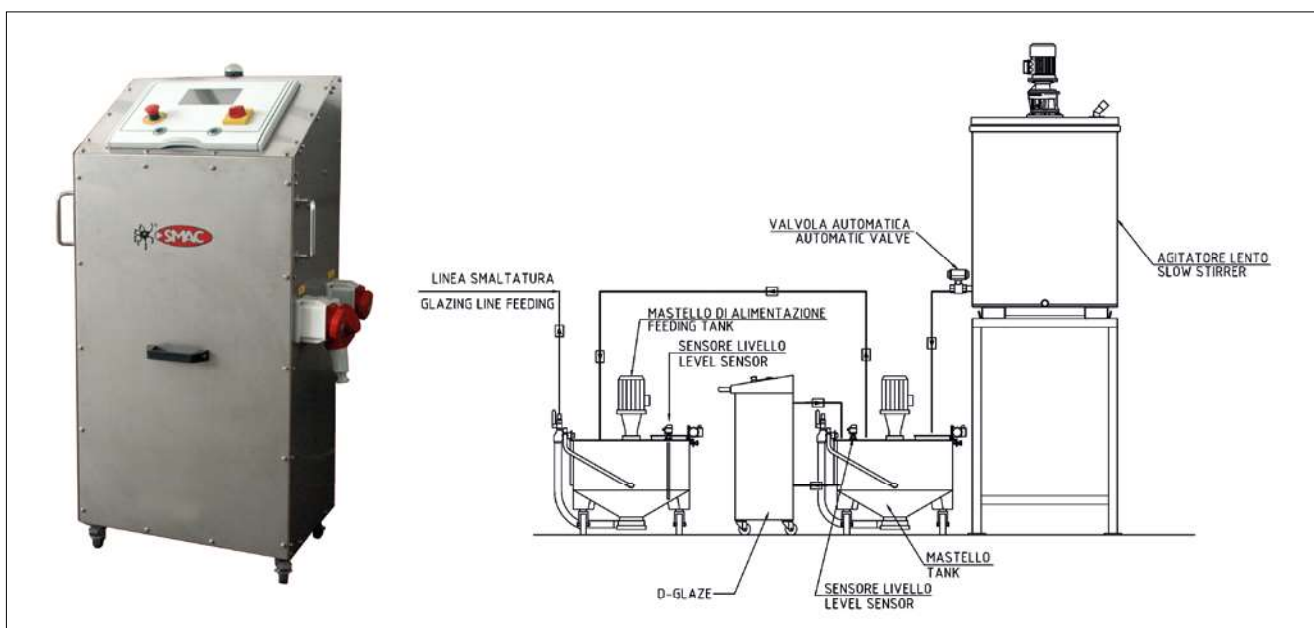


Fig. 4 D-Glaze device with functioning scheme



Fig. 5 Airless glazing system TITAN

(Figs.: SMAC)

of the filling procedure, the system begins to dilute the product with water by suitable cycles of addition/mixing until reaching the density set by the operator.

Once reached the required density, the product is ready to be sent to the feeding tank of the glazing machine. By means of a level probe installed on the user tank, the

product quantity is continuously monitored. When the quantity falls below the minimum value, D-Glaze automatically provides the line with glaze with correct density until reaching the maximum amount set.

The glaze inside the tank connected to D-Glaze is kept under constant control by an electronic densimeter and is suitably corrected in the case the density bait from the tolerance range set. The glaze density is reduced by water addition or increased by glaze addition from the storage tank. The cycle continues according to this principle until complete emptying, after which it re-starts from the beginning.

The benefits of the D-Glaze device are:

- Glaze feeding complete automation for the glazing line and drastic stop reduction with consequent productivity increase and waste decrease.
- Glaze density real-time monitoring sent to the decorating machines and full automation of density correction with consequent elimination of eventual human errors during the process.



OPPORTUNITIES & CHALLENGES

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16 NOVEMBER 2017

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- Avoid of glaze waste and colour variations with significant savings in time and money.
- Elimination of delays due to manual glaze preparation and increase of the final product quality, thanks to a continuous electronic control.
- Reduction of maintenance operations of the decorating machine.
- Elimination of heavy operations: the staff will no longer come into direct contact with glazes and other potentially harmful products.

TITAN: airless glazing system for large-format tiles

The ceramic tiles production has recently embarked on a road leading to more and more large-format production, either by traditional pressing or through plants of new generation with continuous compaction systems. Officine SMAC, being always attentive to new customer requirements, has designed the innovative airless glazing system TITAN dedicated to these new ceramic slabs.

TITAN is a system for the application of engobes, glazes and crystalline layers on tiles with a max width of 1800 mm, ensuring a perfect and uniform coverage of medium, large and extra-large formats thanks to an innovative double movement of the upper guns. TITAN allows the application of small or big quantities using a patented system with double motorization on each single axis due to a motor for transversal movement and a motor for oscillatory movement. Both movements are electronically controlled by PLC on colour touch-screens of big size. The system can use any kind of pump for glaze feeding, high pressures are not needed. It adapts itself to production speeds and can be quickly installed with no interruption of the conveyor. The independent support frame ensures maximum stability and erases all vibration problems in the production line.

The system can work in different modes:

- random transversal: fixed spray-guns with axes transversal movement

- random oscillatory: oscillating spray-guns with axes in fix position
- random combined: oscillating spray-guns with axes transversal movement
- synchro: axes transversal movement with combined oscillatory and synchronised movement of the spray-guns ensuring perfect and uniform glaze coverage on large and extra-large formats.

The technical features of the system are:

- AISI304 stainless steel cabin for the whole collecting tank
- independent support frame
- innovative double movement system independent for each spray-gun
- control board with PLC and encoder
- operator panel with colour touch-screen and production recipes setting system
- dust suction system
- support belt guides made of stainless steel
- four lateral doors for inspection and cleaning
- bottom and lateral internal nets
- supports for upper spray-guns.

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