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CUGHER

Plants for glass screen printing

Reliable & Future Oriented

Home appliance

The home appliance division provides silk screen printing solutions for a sector where printing speed is essential.





CUGHER

Plants for glass screen printing

Since over 50 years we are leaders in studying, developing and implementing of cutting-edge solutions for flat glass silk screen printing

Cugher is the ideal partner for companies that print on flat surfaces, it is able to provide highly customized solutions according to Customer production needs.

Competence

Cugher has implemented big investments in design and engineering to build up and anticipate proper solutions for the most complex customization requests.

Research&Development

Each activity in Cugher involves technical department, production, sales and marketing, purchasing and human resources. All Cugher departments work together to continuously increase product and service quality.

Structure

Automotive

Architectural

Home appliance

Application fields



Complete printing line for Home Appliance Glass

- Handling
- Dryers
- Print
- Vision systems

Mono and multicolor silk screen printing on rigid surfaces, flat glass for special applications, household electrical appliances, cooktops, flat screens and photovoltaic cells.

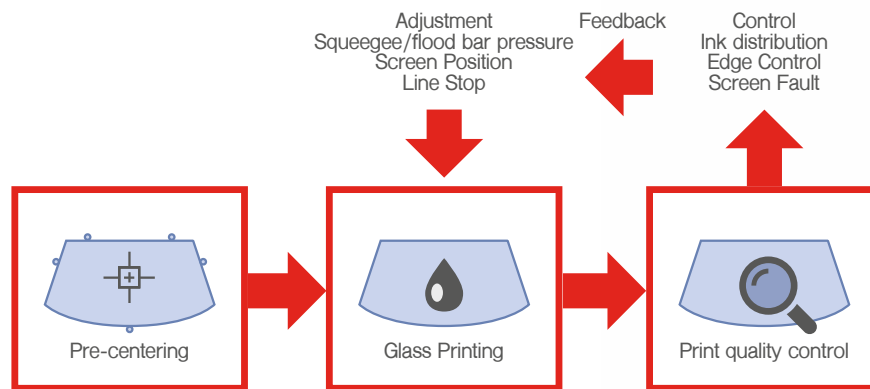


CUGHER
Plants for glass screen printing

Cugher technology for an enhanced productivity

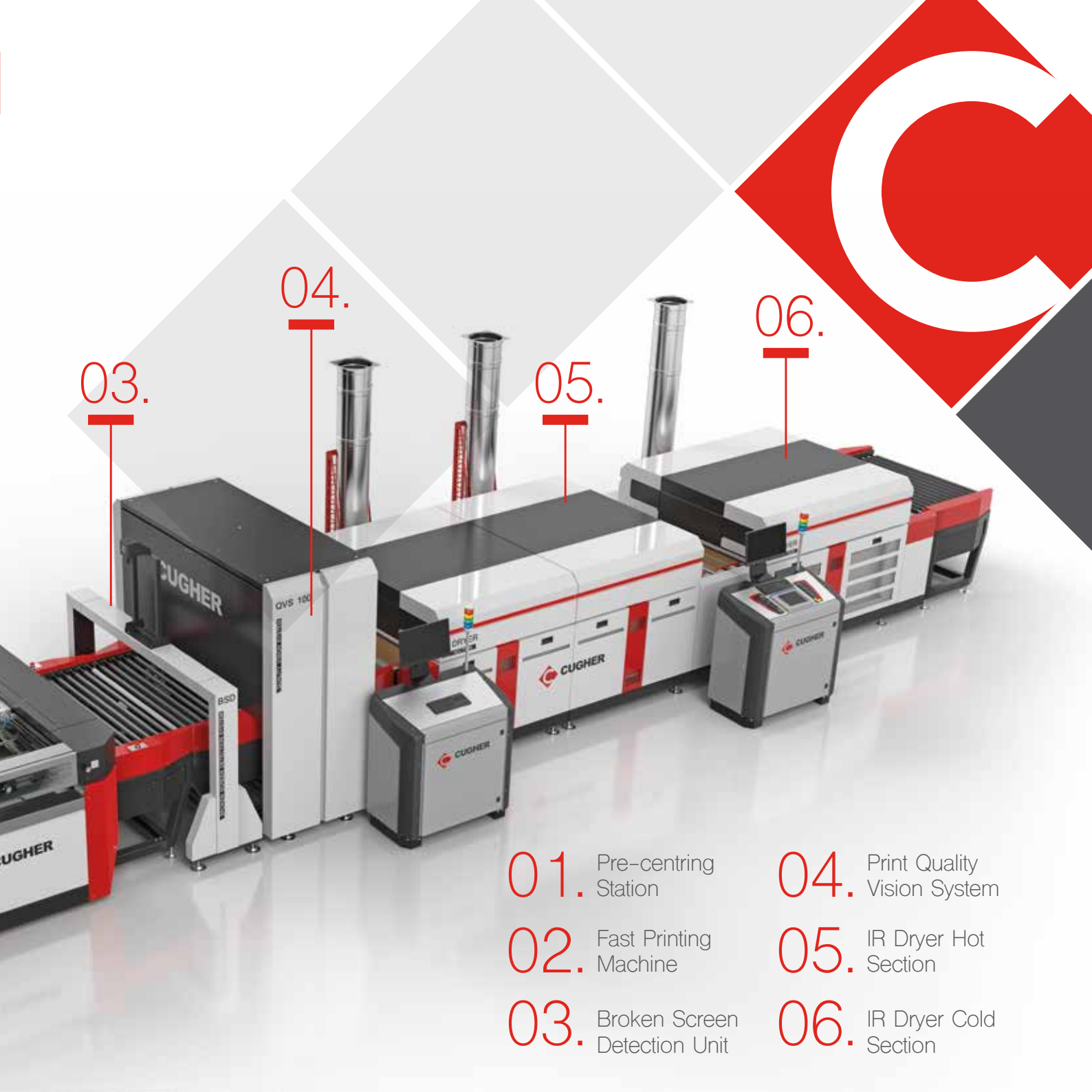
PRODUCTION CHANGE-OVER

The production change-over is a basic task in the Home Appliance industry, where the requirements to change the type of glass to be printed is very common. The change-over can be carried out by a skilled operator in a few minutes, thanks to the self-learning system of the glass formats. Moreover, all the operations related to the different batches can be easily performed by a single operator on the machine.



All Cugher silk screen printing machines can be designed for short edge leading or long edge leading glass flow orientation.





03.

04.

05.

06.

01. Pre-centring
Station

02. Fast Printing
Machine

03. Broken Screen
Detection Unit

04. Print Quality
Vision System

05. IR Dryer Hot
Section

06. IR Dryer Cold
Section



Key plus

- Short Cycle Time: 6 seconds
- Printing repeatability $< \pm 0,08\text{mm}$
- Guided learning of the glass shape;
- Motorized automatic correction of the register;
- Automatic regulation of the squeegee pressure independently of the glass thickness;
- Screen cleaning out of the Printing Table, without losing the register;
- Pneumatic fixing of the nesting plates, without the use of any tools.
- Quick set-up and changeover time (less than 5 minutes)
- Line Supervisor and Part Tracking System

Quality Strictness

- Declaration of Conformity
- Risk Assessment
- Technical File
- Operation and Maintenance Manual

Printer FAST Series & Printer LS Series

Cugher production, which is conducted by the Flexible Engineering driver, is ready to satisfy the emerging needs of the market and adapts its solutions on these trends: the production of each single component – hardware and software – is industrialized so that it can be subsequently customized and configured on the base of the contract specifications, without an excessive effort of resources.

The **Fast series** is extremely rapid and offers excellent performances with regard to cycle times and production change-over. The **Fast series** can print on both large and very small surfaces. The change-over of the production can be done by a skilled operator in a few minutes, thanks to the self-learning system of the glass formats.



FAST Series Printing Machine



The main features of the Fast series are:

- Possibility to set different speeds for squeegee bar and scraper
- Anti-drip system, on the printing bridge (squeegee bar / scraper group)
- Constant pressure of squeegee bar and scraper, which can be set from the recipe on the operator panel
- Quick and easy frame registration, with micrometric precision on all directions, including rotation
- Adjustable height of printing head, depending on glass thickness and to make cleaning and maintenance operations easier
- Frame extraction without losing the registers and pneumatic locking of the same
- Possibility to raise the printing head up to 500 mm to facilitate cleaning / maintenance operations (in total 1500 mm from the floor)
- Anodized and ground aluminum printing table, provided with belts for moving the glass in order to be able to handle even holed glass
- Cycle time: 6 seconds: with maximum glass size – 800 x 1000 mm – possibility to print up to 600 glasses / h
- Recipes based printing machines and lines for quick setup & changeover

FAST Series	100x80	130x100	160x100	200x130
Min	250x250	250x250	250x250	400x300
Max	1000x800	1300x1000	1600x1000	2000x1300



“ A proof of the continuous relationship with customers and of the attentive and constructive listening to the production needs coming from the sector, is the innovation content implemented by Cugher on the Fast line, that improves its production performances. ”



FAST Series Printing Machine



PLUS

The front pins for the quick centering change on printing table switch from two to four and are automatically selectable from the recipe, based on the glass size. Through the selection of the recipe, the operator engages the internal or external pair according to the dimensions of the glass being processed. This allows an even more precise centering. The replacement of the pins, in case of wear, occurs in a few seconds.

The new side bars on the pre-centering have been modified so that there are no screws in contact with the glass even when the bars start to wear out.

The replacement of the nesting plates is done simply and quickly through dedicated knobs on the top.

Motorized Peel Off adjustable from the operator panel: this functionality has been automated and now the setting of the peel off is done directly from the recipe.

New nesting plates system on the printing table: the new nesting plates were built and mounted on the printing table to optimize the centering of the glass.

The **new belts** for glass movement are stronger and quick to replace.

Our machine is like a Digital Caliber

Our system allows a perfect control of the height of the printing bridge, having a height position precision higher than 0,1 mm.

The vertical movements of the printing bridge are controlled as a digital caliber, which has the “zero” represented by the printing table (perfectly flat, even surface) and the operator can set the desired height into the touch panel.

Easy Cleaning without losing Screen register

Pull out of screen with pneumatic Screen Frame Locking System.

The screen can be locked in position by means of pneumatic cylinders and it's possible to use frames of different heights.

Thanks to this feature, the operator doesn't need to lock manually the frame, and the insertion and extraction of the screen results to be an extremely fast and easy operation.

OPTIONAL

- Additional centering pins on the inlet conveyor: in the pre-centering phase they facilitate the perfect alignment of the glass before entering the printing table
- Antistatic bar on the printing bridge: it allows to eliminate all the electrostatic charges that accumulate on the frame during the passage of squeegee bar and scraper
- Sliding squeegee clamp: it is possible to slide the clamps on the printing bridge according to the dimensions of the squeegee bar
- New frame centering system: thanks to the integration of cameras in the printing table, the automatic centering of the frame achieves maximum precision and speed
- Motorized frame holder: to help the operator in inserting and extracting the frame
- New system for scraper pressure adjustment: in addition to the pressure adjustment in the recipe, an additional manual adjustment is allowed, according to production needs
- Ball glass lifting system for pre-centering of particularly delicate glass: it allows a perfect pre-centering, ensuring that the glass is not scratched

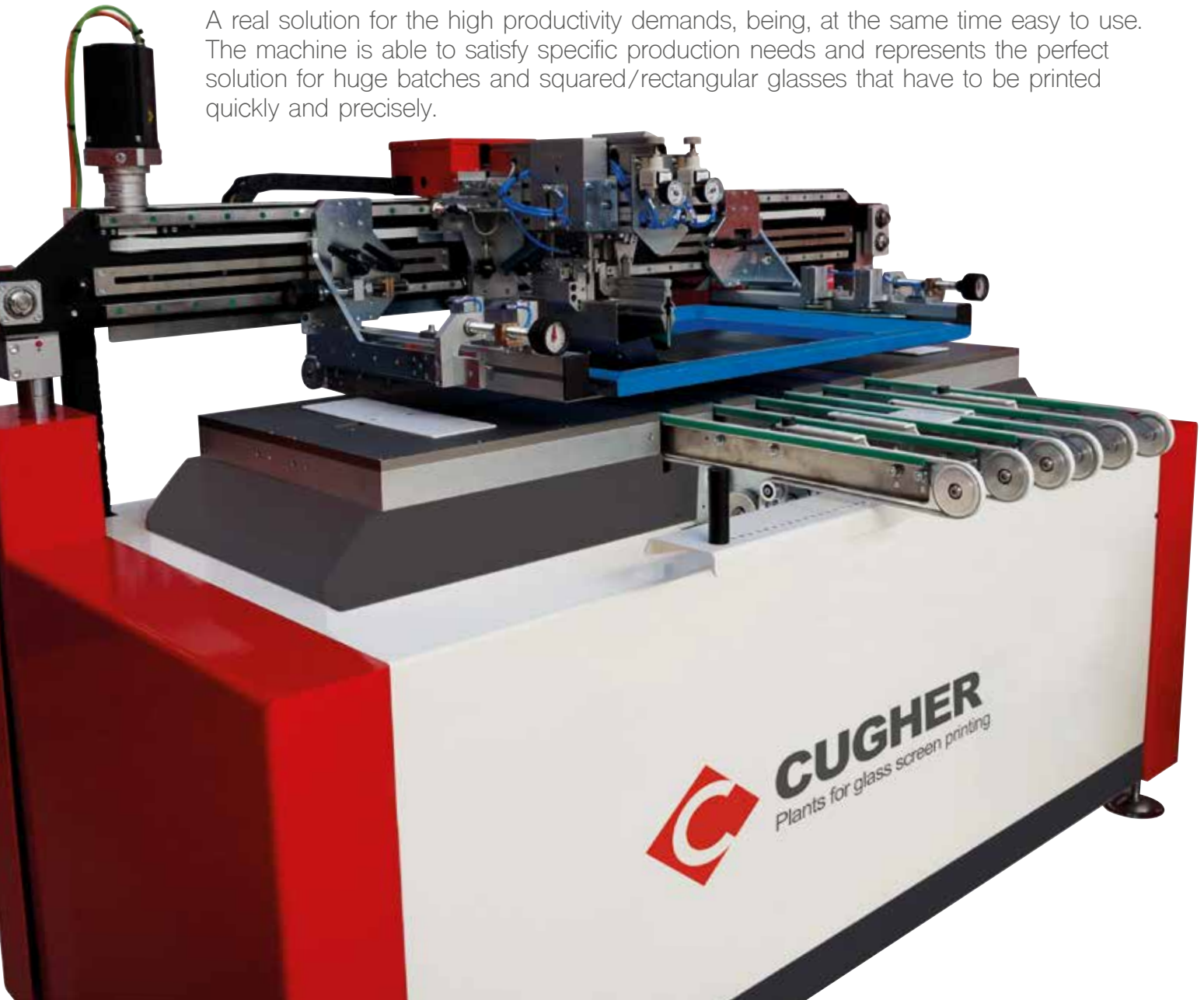


All the machines are designed to be equipped with the related options.

LS Series Printing Machine

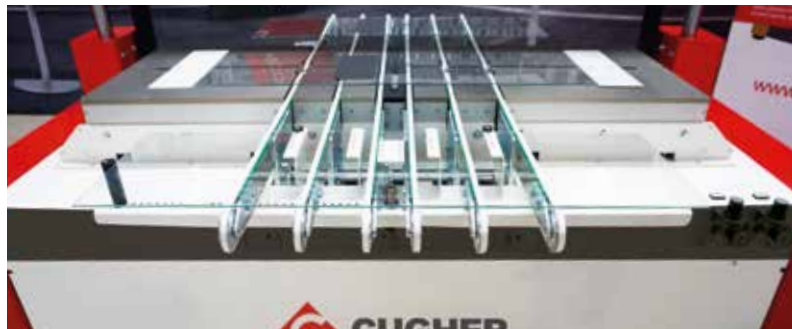
The flexibility to be used as a Stand-Alone printing machine or to become the heart of a full automatic printing line

A real solution for the high productivity demands, being, at the same time easy to use. The machine is able to satisfy specific production needs and represents the perfect solution for huge batches and squared/rectangular glasses that have to be printed quickly and precisely.



Main features

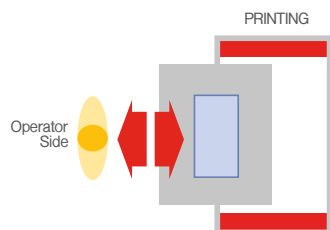
- All the controls of the machine are **positioned on the operator side**
- Easy loading/unloading from the operator side
- High precision, high speed print on flat glass of variable size and shape
- **Off-Contact and Peel-Off adjustment:** electronic setting by HMI
- Fine Registration of the screen position on the three axes (X-Y-Z)
- The squeegee bar support group can be equipped with Anti Drip System
- Manual Unloading of the glass assisted by two pins which lift the glass from one side
- Extremely fast change over



Extreme Flexibility

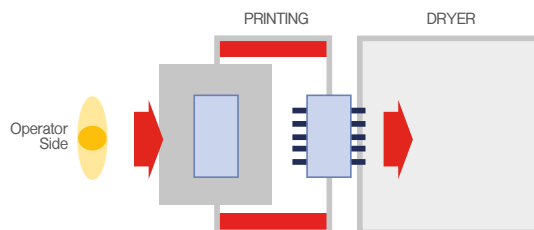
LS Stand-Alone

Manual loading and unloading, on the operator side, with extractable printing table.



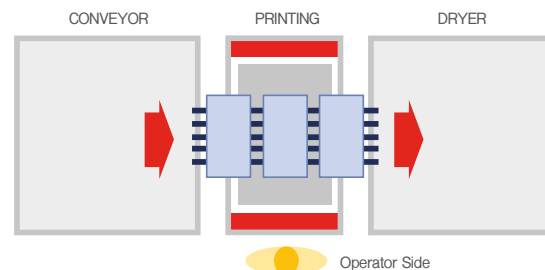
LS Semi-Automatic

Manual loading and unloading of the glass, on the operator side, with extractable printing table. Automatic rear discharge with transport belts.

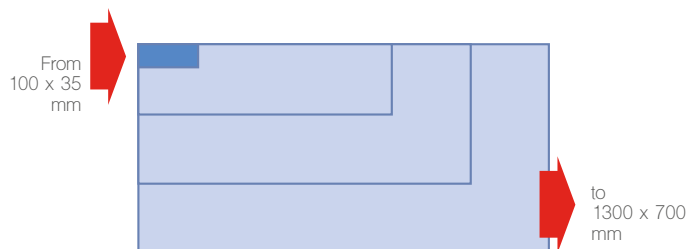


LSF Full-Automatic

Automatic glass loading and unloading by a belt transportation system.



Glass Size



LS Series Configuration

70x30	100x30	130x30
70x50	100x50	130x50
70x70	100x70	130x70

Dryers



All Cugher dryers comply with the highest energy standards and are designed as an integral part of the line, with the possibility to study and realize different temperature curves in each module, to ensure an improved productivity.

The Cugher Dryers are manufactured with the best existing materials to guarantee the maximum reliability of the line.

IR Dryers

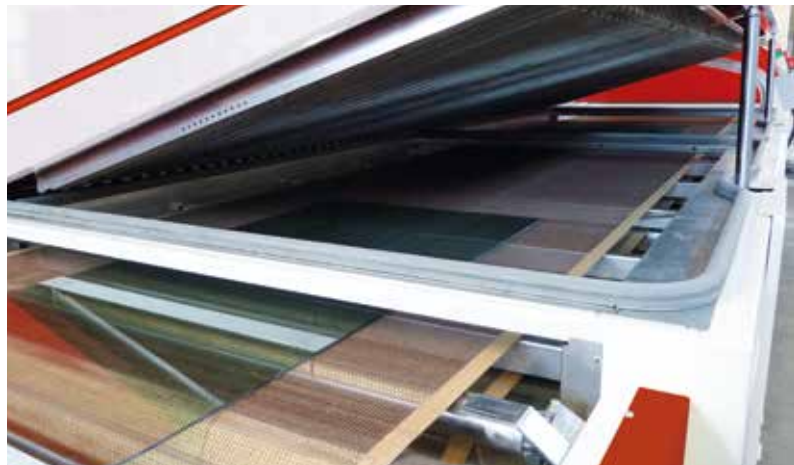
The drying technology of Cugher IR Dryer combines the effectiveness of the Infrared lamps and the air blades, in order to distribute the heat uniformly and obtain a better and quicker curing of the ink. The conveyor speed can be regulated to meet Customer productivity targets.

The Power Saving features, allow the operator to adjust the lamps power to the real necessities for each type of processed glass, avoiding useless power consumption.

The power data can be stored into a recipe that can be easily recalled by the operator panel.

In order to avoid any damages, the glasses are transferred by means of special Kevlar belts.

Inside the cold module, there is a controlled air circulation, which allows cooling of the glasses up to a temperature approximately of 30°C higher than the ambient temperature.



UV Dryers

Cugher Digital UV Dryers are equipped with dedicated anti-reflection shields, placed on the dryer's inlet and outlet, to protect the operators from the UV radiation, allowing safe operations.

An innovative digital control system for lamps management allows power saving and productivity increase.

IR/UV Combi dryers

Cugher Combi Dryers are composed by three sections. The first section is an IR dryer with hot modules, the second section is a UV dryer, while the last section is an IR dryer with cold modules (cooling section). When the UV dryer section is used, the first and third sections will operate as a conveyor, while when the IR dryer operation is requested, it will be the UV section to operate as a conveyor.

PLUS

EXHAUST SYSTEM

HOT SWAP FAN

The fans can be replaced with the oven in production.

FAN ROTATION CONTROL KIT

This kit allows to have an alarm in case of breakage of the propellers' pulleys of the dryer hot section.

OPTIONAL

CHILLER UNIT

To obtain lower glasses outlet temperatures, approximately between 25°C and 35°C, the cold modules of the dryers can be equipped with a cooling device (Chiller unit plus thermal exchangers).

PYROMETER KIT

This kit is useful to verify the temperature of the glass at the exit of the hot section and at the exit of the cold section.



Vision systems

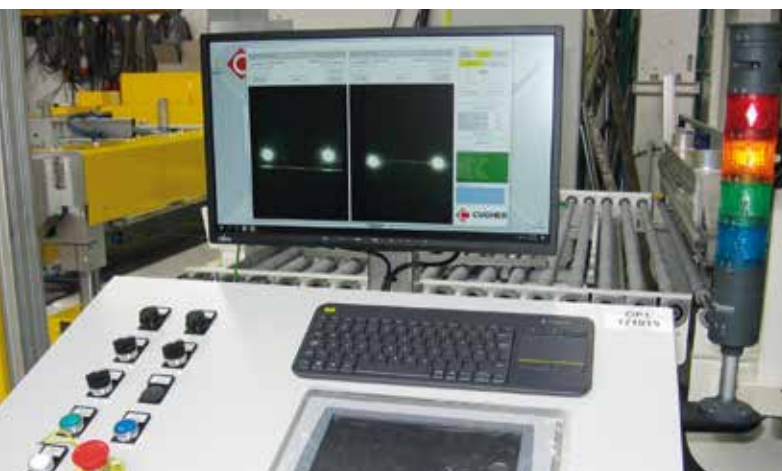


Online Automatic Print Quality Control System

The Automatic Print Quality Control System, having a resolution up to $60\mu\text{m}$ for the 1000 mm glasses and $122\mu\text{m}$ for the 2000 mm glasses (on long edge leading), is able to verify the quality of the design up to a circular dot of $0,09\text{ mm}^2$ and recognize any “slavering” or “widening” of the design’s details due to an excess of ink coming from the screen. The system is able to detect fade out dots, pin hole, or if there are missing parts of the design and alert the operator to verify the possible cause (e.g. lack of ink, dried ink on the screen, etc...).

Glass Quality Automatic Inspection

This system, typically installed downstream the washing machine, is able to scan the whole glass and detect any defect present on the raw glass. The extremely high sensibility and the exclusive lightning system, allows to identify any scratches (even the lighter ones), shell chips, bad edgeworks, seeds, stones, adhesion chips and other surface defects.



Automatic Screen Registration System

The use of the Automatic Screen Registration System, being able to realize the alignment of the screen in a blink of an eye, allows performing a complete model Automatic Screen Registration System": change-over in an extremely short time, since the machine setup becomes completely automatic and the operator's action is reduced only to insert the new screen into the printing machine.



Broken Screen Detection Unit

This special unit has been studied to control the glasses and to check the presence of ink spot on the lower surface of the glass.

This unit is positioned just downstream the printing machine.

The advantage of this innovative system, if compared with other "aged" system, is that doesn't matter where the screen has been broken or how "small" can be the hole; if there is a leakage of ink, this unit will detect it.

Easy Maintenance & Safety



Safety Fences

As requested by the European Safety Regulation, adequate safety fences must be installed to keep under control the access to the printing machine and line. The fences, that have a height of 2000 mm, are equipped with interlocked doors that allow the entrance into the line. The access request is made by buttons controlled by the safety access software. Note: The installation of the safety fences is mandatory in order to obtain the CE Compliance Declaration for the equipment.

Maintenance

The very easy maintenance operations have been further improved thanks to some recent interventions on the design of the machine itself. Machine downtimes are very low thanks to reliable and high quality components.

Interactive system for maintenance and spare parts management



- ✓ Easier maintenance
- ✓ Accurate parts orders
- ✓ User friendly interface

- 3D exploded view for each printing line element
- Several visualization styles
- Sub-parts analysis and assembly view
- Spare parts orders directly from the system
- Part list automatic update
- Free access, no licenses needed

✓ Almost zero human errors
Data always updated

➡ From drawing to order
in ONE click

Line Automation Software



Dedicated software(PLC/HMI System), expressly realized to manage the printing line, allows the total control of the line and carries out the part tracking, managing all the emergency situations.

Adequate line control panels will allow the operators to control the printing area and the handling line. The main Panel shows a graphical view of the exact positions of the glasses on the handling line (parts tracking system), giving the operators a perfect idea of the line's situation and the capability to manage all the situations.



PLUS

LINE SUPERVISOR

This system allows to see the line as a whole, with all information for the part-tracking and it is where the recipes are stored (machine and dryer working parameters etc...). Thanks to the Line Supervisor is possible to automate the changeover. In the supervisor station is possible to store thousands of glass models recipes.

PART TRACKING

It is the possibility to track the glass all across the line and contains all main information such as type of glass (inner, outer, paired) production ID number and other information related to the handling inside the line.

DIAGNOSTICS

TROUBLESHOOTING



REMOTE ASSISTANCE SYSTEM

The Remote Assistance System consists of a hardware that will be connected directly to the printing machine PLC and allows to perform a remote connection to the printing line.

The system requires only to be connected to the internal LAN or to internet.

The presence of this system allows to have the support of the Cugher's software engineers without the need of a dedicated PC (with all the Software Licenses loaded!).

It doesn't require the operators work to connect the PC and run the software.

Using the Remote Assistance System, it will be possible to intervene remotely on all the line's parameters and give support to Customer technicians and operators in case of need.

No additional installation is required.

ADVANCED

FITTED_PERFORMANCES

PLANTS FOR GLASS
SCREEN PRINTING



360° Customer Service

Turnkey Solutions

Your partners in the pre - production
settings and starting process

12 months warranty assistance
(taking charge <24 H)

Customer Service &
Technical support

World Wide Technical Assistance

Spare parts

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