

# FLOOR CLEANING LINES



## “BETA V WITH NESTING MACHINE”

*During the course of more than 30 years in the manufacture of machinery, our premise has always been the quality of our products. We know that perfection does not exist, but we are sure that we strive for it with perseverance and determination.*

*In the last decade, our evolution has taken us to the technological top at international level, being to date, the first company to manufacture production lines in all the sectors in which we are represented.*

*Thank you for trusting in our perseverance*



**CEO - José Ferrando García**

## DESCRIPTION

Production line for the manufacture of cotton fibre or cotton yarn mops in their traditional form.

This production line is a set of intertwined lines which are synthesised to form a single system, enabling all the processes necessary for the manufacture, bagging and boxing of the product to be carried out.

Its improvements with respect to its predecessor are very diverse, greater production and a reduction in pneumatic consumption, making it much more profitable.

The safety systems have also been improved, the environmental noise has been reduced, producing an improvement in the quality of work and saving plastic.

We have entered fully into a new machinery philosophy, better for the company, for the worker and for the environment.

## TECHNICAL CHARACTERISTICS

- STRUCTURE

Formed steel structure. Currently all Jofesa machines are manufactured with structure finished in electrogalvanised and fire-lacquered paint.

- LIGHTING

Lighting with 5050 LED strip lights, with RGB colour change (green, blue and red) throughout the machine, which increases communication between the operator and the machine. Energy saving and environmental protection.

- CONTROL

New OMRON SYSMAC automation platform. Currently all Jofesa machines are installed with this new platform from the smallest to the largest machines with the same controller, which provides the speed, flexibility and scalability necessary for today's industry.

This allows us to expand our machines without having to change the installation. The controller, based on the new INTEL CPUs, integrates drive, logic, safety and vision, all programmed from the same software with cycles of 128 axes / 250  $\mu$ s.

Our machines have two communication buses:

- Ethercat (Can based on Ethernet): the fastest machine network on the market, with which we connect to all machine devices without the need for complicated wired installations.
- Ethernet-Ip: a very robust and fast industrial Ethernet bus to which the machine's touch terminals are connected, from which all the machine's settings and parameters are controlled and selected, and which we can connect to our customers' network to collect all the necessary information (Industry 4.0).

Each module of the machine has its own control panel, which communicates with the CPU via a single ethercat cable. The servomotors, inputs, outputs, safety, machine vision and all the pneumatics are controlled via this bus.

The sysmac platform also integrates the safety solution, both the safety controller (specific safety CPU) and the safety inputs/outputs are freely distributed throughout the machine, simplifying the installation, as well as the monitoring of the safety status on the touch terminals.

- MOTORISATION

The heart of our machines are the Accurax G5 servo systems, the perfect combination of control and mechanics. The control of movements is mainly carried out by servomotors. All the drivers that control the servomotors incorporate, in addition to the Ethercat bus, a safety input in accordance with performance level D of ISO13849-1.

They are controlled by a Motilon Control CPU, which allows us to make interpolations, Cam tables or electronically connect axes with each other, making the most difficult tasks easy.

In addition, where a servomotor is not necessary and a simple motor is sufficient, this will always be controlled by MX2 series drives, with open-loop torque control, which allows us to control them from speed 0, with safety inputs to disconnect the motors when the safeties are open.

- DETECTION AND VISION

Our colour or contrast sensors are also integrated into Sysmac and connected via the Ethercat machine bus, allowing us to program, configure and visualise any photocell from the touch terminals, as well as providing ultra-fast response speeds.

- PNEUMATICS

Pneumatic motion control is also integrated, based on the fully configurable and scalable FESTO-MPAL terminals and connected via the Ethercat machine bus. All solenoid valves can be activated manually from the machine's touch terminals and the actuation times can be adjusted.

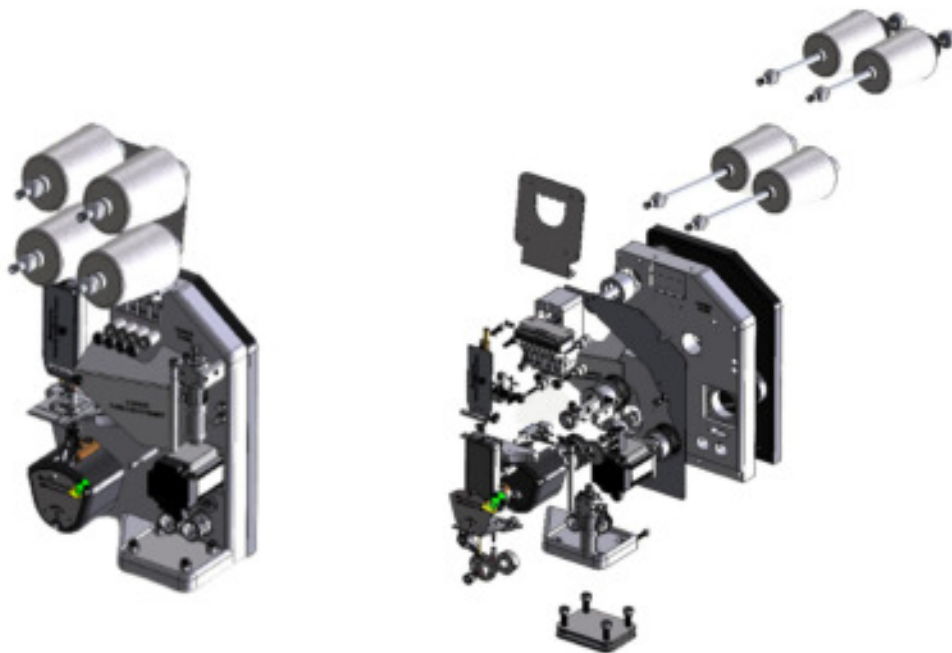
Approximately 90% of the pneumatic actuators are manufactured exclusively for the required performances, with a patented pneumatic system (COMPAC SYSTEMS) that optimises the space and application of the system, facilitating changeover and maintenance with a proprietary changeover system.

- SOFTWARE MAINTENANCE

All this with a single software from which everything is controlled and which can be accessed via the internet to monitor changes to the programme or maintenance tasks.

- MANUALS AND REGULATIONS

Manuals and CE regulations and a CD with all the components of the machine in three dimensions is included, which allows maintenance and changes to be made, visualising the components without having to dismantle the machine.



## PROCESSES

- ASSEMBLY PROCESS
  - Grapple and cup feeder silos with endless belt system.
  - Vibrating tanks for staple and cup classification.
  - Clamp and cup distribution system with motorised cylindrical belts.
  - Staple and cup assembly system with servo-controlled double motorised system, with intermediate stop for thread trimming.
  - Skein stretching system with double clamping system.
  - Cutting system with circular blade 160\*1-HSS with servo motor.
  - Low mopping system up to the cardboard placement process with servo motor, manipulators with rotating system for introduction to the bagging machine with servo control.
  
- BAGGING PROCESS
  - Bag introduction manipulator with servo motor and clamping system.
  - Intelligent plastic alignment system developed by Jofesa (ALWAYS STRAIGHT).
  - Roller feeding system, with motorisation and compensation system. Longitudinal welding system with temperature system (PID).
  - Transversal welding system with temperature system (PID).
  - Double bagging system with longitudinal welding and servo-driven conveyor belt drive.
  - Detection system for marked or printed film.

## USER/MACHINE INTERFACE OPERABILITY

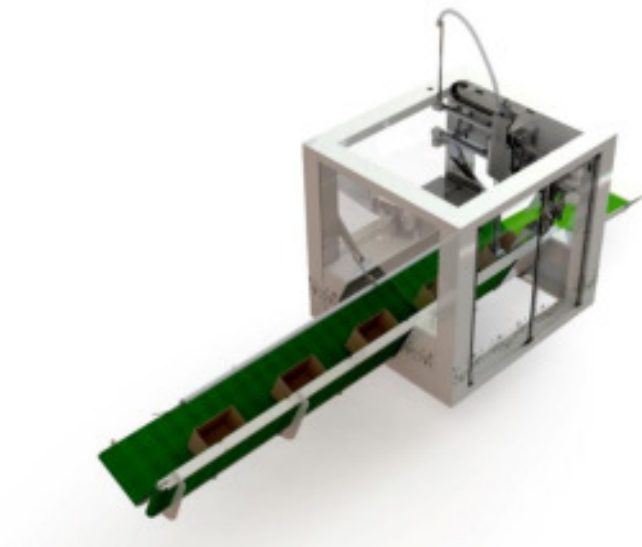
All the configuration of these parameters would make up a programme, and an infinite number of machine programmes can be programmed, which means that when the programme is changed, all the changes in that programme are memorised.

- Programming of the number of mops in production.
- Skein length programming.
- Programming of assembly level.
- Speed programming.
- Programming of all distances in all axes.
- Programming of distances in cardboard or glassboard placement.
- Single or double programming.
- Programming of bagging distance.
- Programming of times and speeds of the whole machine (with technician key). Etc...

## PRODUCTION AND CONSUMPTION

- PRODUCTION AND CONSUMPTION
  - PRODUCTION: 1500 units/hour
  - PACKS PRODUCTION: 750 pack 2 units/hour
  - PNEUMATIC CONSUMPTION 600L/m.
  - ELECTRICAL CONSUMPTION 1.7 kW.
  - ELECTRICAL POWER: 9 KW.

## NESTING MODULE



## TECHNICAL CHARACTERISTICS

- Formed steel structure.
- Structure finished in hot-dip galvanised electro-zinc paint.
- Movement on rectified hardened steel guides.
- Machine control by OMRON PLC.
- FESTO pneumatics.
- OMRON servomotors.
- OMRON Drivers.
- LEUZE detection system.
- Pneumatic pressure 6 Bar.
- Pneumatic consumption, 50lts/min.
- Three-phase voltage 380V (L1+L2+L3+N).

## **CARTONING PROCESSES**

- Case size programming.
- Programming of units per layer.
- Programming of horizontal or vertical position of mops per box.
- Programming of total layers.
- Diverter of failed mops.
- Minimum size in the vertical direction 13 x 13 x 30
- Minimum size in horizontal direction 25 x 12 x 12 x 12
- Maximum size in horizontal direction 60 x 60 x 60 x 60
- Case packer XL - Display tray 800 x 600 x 600 x 600 mm.

## **PRODUCTION AND MEASUREMENTS**

- PRODUCTION

- Subject to the production of the BETA V machine itself.

- MEASUREMENTS

- Measurements are included in the general drawing of the machine on page 7.



## PLAN AND DIMENSIONS

