machinery & plant for EPS

NUOVA IDROPRESS S.p.A.

Nuova Idropress Spa

A leader Italian Company Manufacturer of Single Machines and Turnkey Plants for Blocks of EPS

The Company exists since 1963 and its activity turned in the EPS World more than 50 years ago

Nuova Idropress Spa, at the moment, has two Plants - both in Canossa (RE) in the Northern part of Italy, a famous region in the whole World, for its tradition of mechanical industry - with a total surface area of 16.000 m² (172,000 ft²) where approximately 110 people are employed as technicians and workers. In 1971 it made the first of more than 750 Vertical Block Moulding machines produced to date and all of which are still operating throughout the World.
The will to grow and the constant technical research brought us to expand our Department of Development Research and Customer Service.
This is a feather in our cap as we rely on more than 30 experienced engineers that design on last generation software in 3D (mechanical part), realize the software for PLC and Machine Supervision (on PC), that are at the base of the functioning of our Machinery and they deal with the start-up of the Plants, as well as the post-sales service (via internet) ensuring a support to the Customers in fundamental languages.

We are convinced that a full customization of our machines built employing high quality “all around the world” available commercial components such as SIEMENS, Festo, Telemecanique, Bosch-Rexroth... is the best way to support the growth of our Customers.

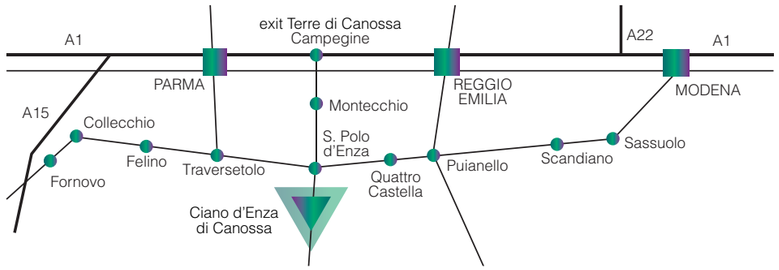
The Machines of Nuova Idropress are

- Completely designed, manufactured, assembled, programmed and tested by our technicians, in our offices and in our workshop.
- Designed regarding the specific requirements of the Customer, very often with personalized solutions.
- 100% Made in Italy.
- Supplied with CE mark and other certificates obligatory to this type of equipment.
- Ecologicals: the choice of components and the construction process ensure the maximum respect of the Environment; the optimisations of technological process take into consideration to lower as much as possible the environmental impact.
- Safe: the operational safety has a high value in Nip machines and is surely seen by our Customers as essential.
- Assembled and tested by the Customer from the same engineers that carried out the design and manufacture of the machine, therefore able to optimize and personalize it, for the most various needs of production.
- Manufactured with the objective for the most long lasting time, fully over-dimensioned in the mechanics and utilizing the most reliabls, standard and available components on the market.
- Unified at level of design, so that the Customers that purchase more machines or complete plants can benefit from spare parts, manufacturing solutions and ways of use common to all the machines.
- Unified and Standardised at level of control system which includes a 19” SIEMENS touch screen industrial PC with SSD and a Standard Supervision Software developed by WINCC from SIEMENS using the same philosophy for the different Equipment.
- Assisted for the entire life of the machine by a customer service at the maximum market levels.

- Examinable by tele-assistance via internet or modem, for carrying out improvements, repairing damages, optimizing the production by adapting the process parameters.

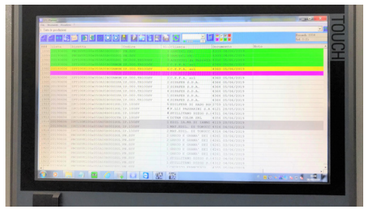
How to find us

Exit MOTORWAY E35 (A1) MILANO-BOLOGNA
In “Terre di Canossa” => 25 Km (15.5 miles)
to Ciano d’Enza di Canossa (RE)



New Softwares for Production Control and Planning

In order to help our Customers to plan in the best possible way their production, we are implementing in the offered range of products a series of software allowing each machine (pre-expander, block mould and cutting equipment in particular) to get a production plan by production orders directly from the ERP software of the Customers (specific personalization to match the specific ERP software of each Customer are possible).
This will allow to show in real time on the machine screen, the progress of the planned daily production and eventually swap the order of the jobs present in the active working list (software suite **“EPS Planner”**).



Additionally production reports will be also available for being memorized and analysed later.

“**EPS Factory**” is the new developed software which stands above the “ EPS Planner” software associated to each machine; it is able to load the whole Customer Factory specific needs:

- way of producing and storaging the material in the intermdiary phases of the production cycle;
- raw material proper use;
- machinery settings requirements;
- minimum stock requirements for finished products...

and therefore plan out the ideal operating mode of the different equipments of the Plant (which will fully communicate via ethernet connections within them) in function of the production that need to be sorted out each day, week or month.

Distance from:

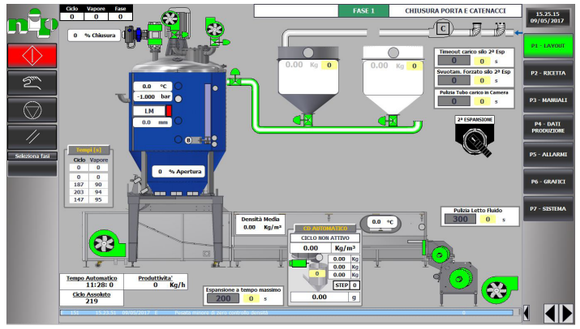
MILANO LINATE AIRPORT 158 Km (98 miles)
MILANO MALPENSA AIRPORT 212 Km (132 miles)
BOLOGNA AIRPORT 100 Km (62 miles)
VENICE AIRPORT 258 Km (160 miles)

Long therm reliability of our machines

Nip is also offering full support to modernize both the Mechanic and the Control System & Software of all its old Equipment, in order to allow Customers to keep using them at “updated” status of the art.

The Conical Batch Pre-expander

The “Nip Tool” to save money expanding Beads in the Most Profitable Way !



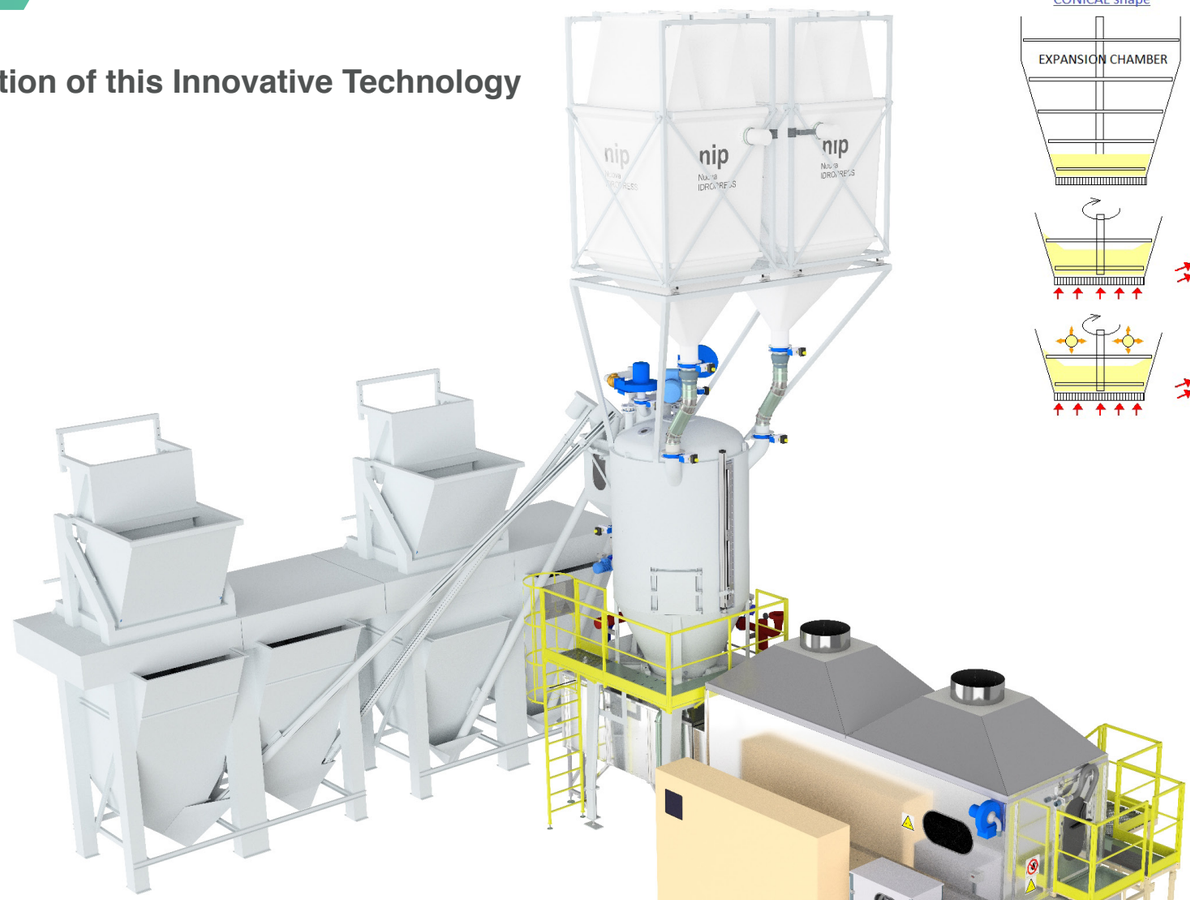
Modern and Advanced Control System

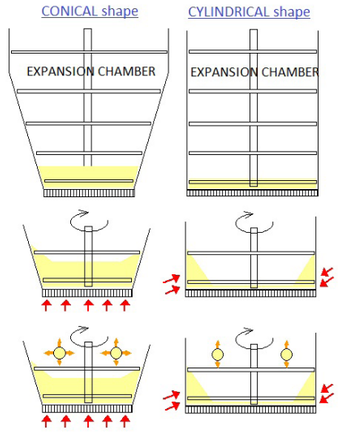
- Process Control by Recipes
- New WinCC supervision system with 19” touch screen Siemens Industrial PC with SSD
- Fully integrable with customer ERP software for controlling the production
- Remote Control for distance support

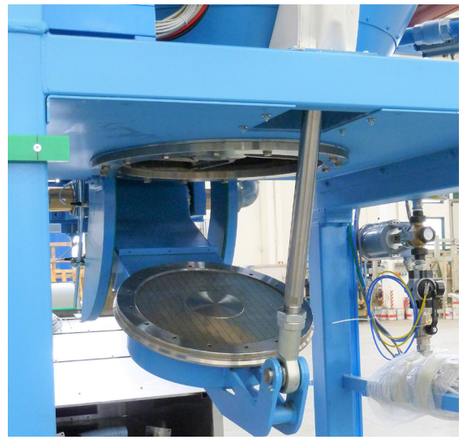
350 Machines Built since the presentation of this Innovative Technology on 1998 !

Main Advantages of Conical Shape & Bottom Chamber Door

- Thicker material layer after raw material loading (narrow Ø at the bottom even for Big Volume Machines).
- Large steaming surface occurring through chamber bottom side having diameter of: 600 mm (23.6 in) & 800 mm (31.5 in) in function of the machine size and ideal also for *low pentane* raw materials by allowing to bring into the vessel a lot of “cold steam (= low pressure steam)” in a short time and at low speed creating therefore a better progressive & uniform expansion process for a definitively more uniform density of the pre-expansion material.
- Very quick and natural emptying from the bottom side of the expansion chamber: it improves the cycle time reducing the contamination risks within following cycles.





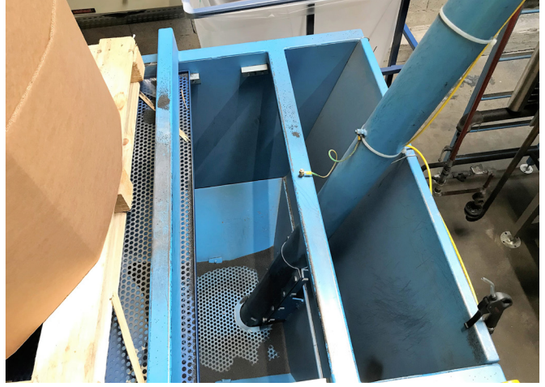


Suitable to run as well 2nd & 3rd expansions when equipped with proper additional Accessory

Optimized technology for expanding in the same machine White & Grey raw materials minimizing the contamination

Are available

- Models for **shape moulding plants** and **small block plants** which can also be provided suitable to run at high pressure up to 2,5 bar (36 psi) TÜV Certified in order to expand in addition to standard eps and Arcel, also epp or special material requiring higher temperatures

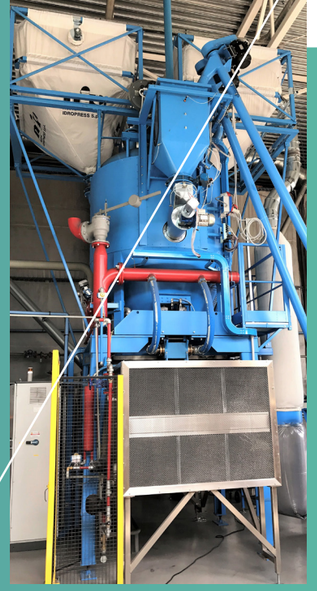


MODEL	Expansion chamber Usable Volume	Productivity in 1st Expansion @ 18 g/l (1.12 lb/ft³)	Productivity in 1st + 2nd Expansion @ 8 g/l (0.49 lb/ft³)
PJX 400 D	0,4 m³ (14 ft³)	300 ÷ 340 kg/h (662 ÷ 750 lb/h)	76 ÷ 85 kg/h (168 ÷ 188 lb/h)
PJX 800 D	0,8 m³ (28 ft³)	576 ÷ 648 kg/h (1,270 ÷ 1,429 lb/h)	144 ÷ 160 kg/h (318 ÷ 353 lb/h)
PJX 1500 D	1,5 m³ (53 ft³)	1.080 ÷ 1.224 kg/h (2,381 ÷ 2,698 lb/h)	272 ÷ 304 kg/h (600 ÷ 670 lb/h)
PJX 2000 D	2,0 m³ (71 ft³)	1.440 ÷ 1.620 kg/h (3,175 ÷ 3,572 lb/h)	376 ÷ 408 kg/h (829 ÷ 900 lb/h)

- Models for **middle and large size block plants**

MODEL	Expansion chamber Usable Volume	Productivity in 1st Expansion @ 18 g/l (1.12 lb/ft³)	Productivity in 1st + 2nd Expansion @ 8 g/l (0.49 lb/ft³)
PJX 3000 D	3,2 m³ (113 ft³)	2.178 ÷ 2.448 kg/h (4,802 ÷ 5,397 lb/h)	536 ÷ 600 kg/h (1,182 ÷ 1,323 lb/h)
PJX 4000 D	4,2 m³ (148 ft³)	2.718 ÷ 3.024 kg/h (5,992 ÷ 6,667 lb/h)	648 ÷ 728 kg/h (1,429 ÷ 1,605 lb/h)
PJX 5000 D	5,4 m³ (191 ft³)	3.276 ÷ 3.600 kg/h (7,222 ÷ 7,937 lb/h)	816 ÷ 920 kg/h (1,799 ÷ 2,028 lb/h)
PJX 6000 D	6,2 m³ (219 ft³)	3.654 ÷ 4.014 kg/h (8,056 ÷ 8,849 lb/h)	888 ÷ 1.000 kg/h (1,958 ÷ 2,205 lb/h)
PJX 8000 D	8,0 m³ (282 ft³)	4.320 ÷ 4.716 kg/h (9,524 ÷ 10,397 lb/h)	1.040 ÷ 1.160 kg/h (2,293 ÷ 2,557 lb/h)

Depending on Custumer Production Requirements definitively we will be able to provide a suitable model of Conical Batch Pre-expander !



Heated Fluidised Bed, which is properly designed to allow running Discontinuous Cycles too, foresees

- Plenty of ventilation for allowing the material to breath quickly
- A special “trapezoidal section” to ensure a proper air flow around the beads
- Heating of the blown air by using steam line condensate for beads better treatment
- Quick evacuation of expanded beads through a De-lumper and then a Rotary Valve which ensures a soft and gentle material handling

Are as well available Cylindrical Inclined Continuous Pre-expanders to be used only for 2nd and 3rd expansions

for Customer that for many reasons need to use this type of traditional technology & equipment as alternative to run such steps of the pre-expansion process on Batch Pre-expanders. Available Models are PJX 1000 C, PJX 1200 C and PJX 1600 C for Productivities between 1000 ÷ 1600 kg/h (~ 2,205 ÷ 3,527 lb/h) @ density 8 g/l (0.49 lb/ft³).

For the Best and Most Suitable Friendly Use in relation of the Operator Skillness machine at *choice* can be operated in

- “**Easy Modality**” with simplified version of expansion cycle that foresees a reduced number of phases.

  or

- “**Expert Modality**” with a larger number of available phases to be set in the expansion cycle with different settings of the various available parameters (pressure, % of vent opening, agitator revolution speed, amount of air to mix to steam for cooling the steam temperature in case of high density).

Monitoring of the Expansion Process

- “**Basic**” with possibility to handle the passage between the various phases of the Steam Cycle **by steps** detecting the material level during the expansion by fixed and very efficient “Vibration Levels”. Each machine comes with one Max vibration level. More levels are available as option in order to handle the change of phases during the expansion cycle by reached volumes and not by time.

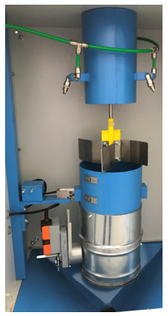
- “**Advanced**” with possibility to improve the Basic System as above described, by monitoring continuously the expansion cycle by a special laser photocell installed on a linear axis which, through a windows on the vessel, is able to “follow & detect” in real time, the level reached by the material during the expansion, creating effectively a sort of capability of the machine to monitorize instantaneously and continuously what is happening inside the chamber. This accessory called “**Automatic Control of Expansion**” definitively allows the machine to compensate any eventual difference in the quality of the raw material which may appear, and ensures a really uniform and constant density precision result in a sequence of various expansion cycles.

Level of density tolerance *reachable* up to ± 1%

Methods of Checking if Target Density has been reached

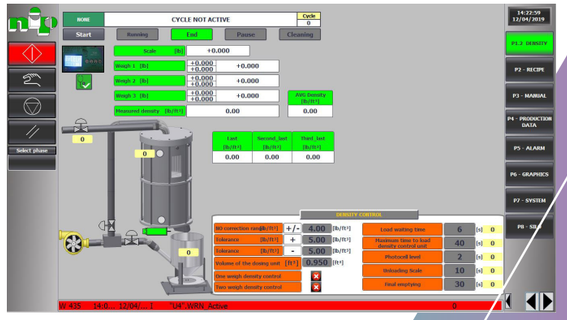
- Automatic Density Control System in **Basic Version** @ 1 sample/batch from fluid bed. It is retrofitting automatically the necessary weight adjustment after weight detection for adjusting the cycle on the scale (during raw material weighing-calibrating phase).

- **Improved Version** of Automatic Density Control System @ 3 samples/batch from fluid bed: with respect of basic solution allows, due to the 3 samples, to achieve more precision of the weight check, by calculating the average of the 3 measured samples / batches. It is also retrofitting a weight change of material under loading, in function of what detected and calculated, exactly as the Basic Version.



Possible to complete the machine with

- More material Hoppers for different quality raw materials
- Octabin automatic tilters
- Cleaning procedures for proper handling of different material qualities and colours
- Easy access to enlarged fluidized bed for easy cleaning by using dedicated suction devices
- 2nd and 3rd Expansions: by weighing through a pre-fill silo the already pre-expanded material, this can be expanded again in the same machine taking advantage of all benefits of a *sophisticated* batch Pre-expander
- Inverter to adjust the speed of material during transportation to silo (acting on the fan) for silos plants wiyh large distances
- Devices to add at every cycle calibrated quantities of colored powders or additives to be mixed to eps beads during the expansion process
- Software for visualising and operate directly from the Pre-expander Control Cabinet and PC both the whole plant virgin-recycled material conveying system and the silo system *via synopyic diagrams*



Automated Silos Plants and Material Conveying Systems

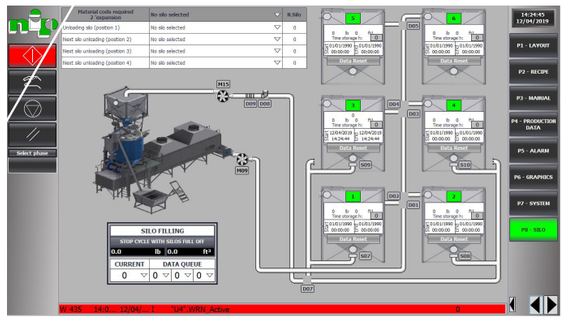
for Pre-expanded fresh material and Recycled material

Ensures a correct handling of the seasoning time of Pre-expanded material by providing in real time and via synoptic diagrams & charts the status and the content of each Silo

In automatic as soon as the time programmed for seasoning that specific material quality is elapsed, the status of the silo moves from “non available” to “available” and therefore the silo con be selected for sending the material to 2nd expansion or block moulding.

All pre-expanded material data associated to each silo contents (from Pre-expander) flows back to the machine in case of 2nd expansion and then back to silos again after the second step is done. Finally data will further move to the Block Mould at the moment of block production.

In such way **traceability** of material through the various steps is ensured.



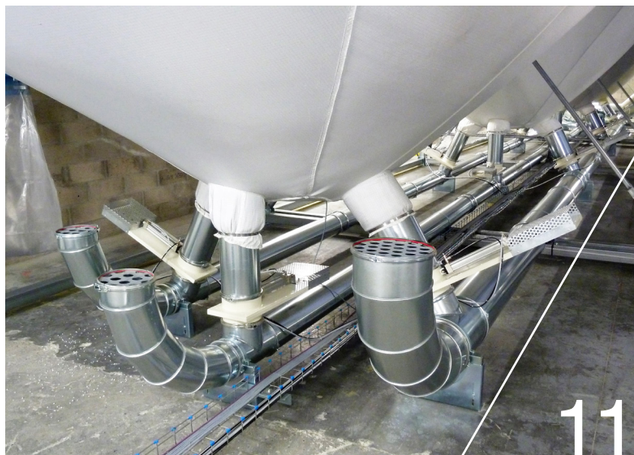
Control carried out directly through the PC & PLC of Pre-expander or in alternative through an independent Control Panel equipped with dedicated PLC and PC .

By Ethernet connections all NIP computerized machines of the Plant (Block mould and Cutting - Recycling Equipment) can visualize the Silos Status and act on Material Flows.

Nip Experience in this sense ensures to provide suitable dimensioning (consequent to proper calculation and long term knowledge) of the whole Material Conveying System for guaranteeing a **proper** material flow rate in the best possible clean and gentle way.

In addition to the Software Control System, the Silo & Material Conveying System foresees

- Suitable rotating 24 DC level indicators, eventually ATEX comply when required by the law of the Country, for detecting material level inside the silos (standard MAX & min level optional: continuous levels - sonars)
- Smooth longitudinal welding galvanized pipelines combined with rubber sealed locking quick release rings, wide radius curves and efficient silicone sealed deviating valves and guillotine valves (both pneumatically controlled)
- Silo Bags made in High transpiring Trevira (polyester) cloth which ensures a dimensional stability, a proper breathability and a good sealing to dust leak for a **clean installation**. Silos can be completely customized to be adapted to Buyer Building. For Recycled material or Grey material, both containing dust, silos can be made with a tighter fabric and the design foresees internal filters to exhaust the filling fan pressure via external sleeve filters which will collect the dust into plastic bags. Volumes available up to 300 m³ (10,600 ft³).
- Fully dismountable (for easy transportation) silo structures made in galvanized proper size rectangular profile steel beams. It can be completed with ladders and upper walking ways for deviating valves and upper level indicators maintenance in proper safety conditions for the operators.
- All the properly dimensioned fans that are automatically started and stopped by the Control Software; the pneumatic, electric and electronic connections in order to run properly the whole System.



TheVertical Block Moulding Technology

A direction opened by Nip way back in 1971 !

More than **750 Vertical Block Moulds** built until now !

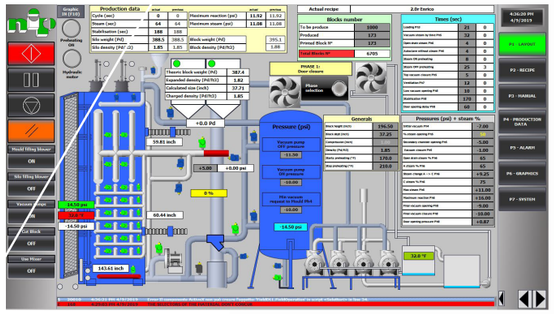
Nip largest experience at customer disposal !

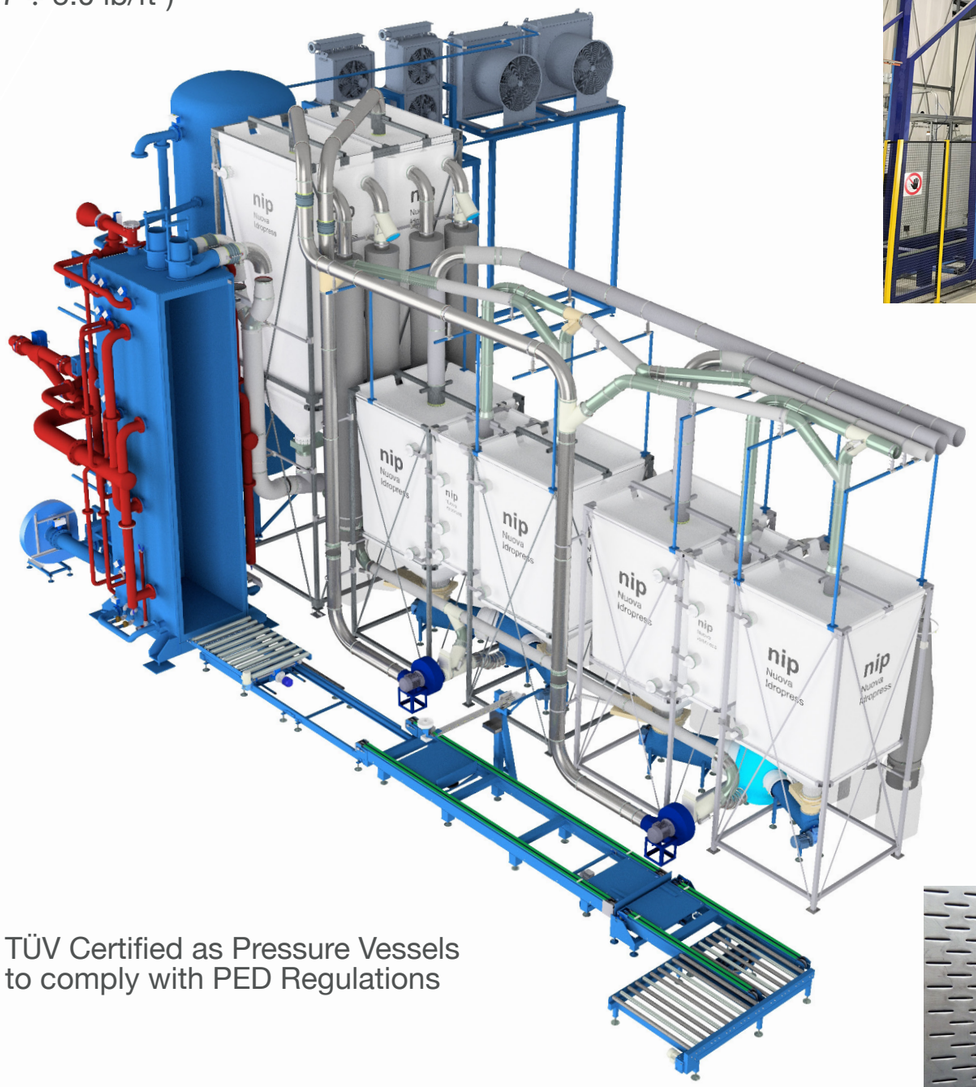
Suitable for Densities of 6 ÷ 80 kg/m³ (0.37 ÷ 5.0 lb/ft³)

For Block size between 1,0 x 0,5 x 1,0 m
and 8,0 x 1,4 x 2,6 m (40 x 20 x 40 in)
and (315 x 55 x 102 in)

Modern and Advanced Control System

- Process Control by Recipes
- New WinCC supervision system with 19” touch screen Siemens Industrial PC with SSD
- Fully integrable with customer ERP software for controlling the production
- Remote Control for distance support





TÜV Certified as Pressure Vessels to comply with PED Regulations

Why Vertical

- Less space Requirements
- Easy Way directly to Block Storage
- Better flow steam Control & lower Steam Consumption
- Higher recycled material % without affecting the density distribution
- Better sheet flatness & stability after cutting, thanks to a modern block moulding technology and to the deep Dry Vacuum features

Green

- Saving Energies in the process thanks to a long therm development technology
- Heat Recovery Systems allowing to save fuel for the boiler by pre-heating water using the “ high temperature heat” from the Dry Vacuum
- Integration with customer RTO Systems for pentane collection
- Available with no steam pressure exhausts

Features to be remarked

- Productivity up to 24 ÷ 25 blocks/h
- Low added humidity ~ 1 ÷ 3 %
- Optimal density distribution up to 1,0 ÷ 2,5 %
- Automatic Density Control System in order to mould blocks with constant weight saving therefore costs on raw material by compensating density gradient due to stratification in seasoning silos. Before moulding each block a weight density check (in automatic) allows via an additional filling and following properly calibrated compression to adjust the density of each block in function of its effective density. Procedure is completely automatic and allows to increase the block density up to Max 7 ÷ 8 %
- Mechanical Compression for production of blocks with high regrind % (up to 100%) - it improves the material welding
- Improved easy dismantle & re-install “single stainless steel steam plates” to simplify & make faster the mould steam chambers & plates cleaning procedures.
  No need of dismantling every time all plates of the cavity !

The Vertical Block Mould are available with

- Fixed dimension
- Single continuous adjustment (depth or height)
- Depth continuous adjustment & height adjustment by fixed insert/s
- Double continuous adjustment (depth & height)
- Direct cutting in height / width and depth at the unloading of the block for a better efficiency & block size optimisation

Dedicated upgrades to make the Vertical Block Mould suitable to run White & Grey materials minimizing the contamination

Low Energy Requirements

- Thanks to special steam paths, **low steam consumption** down to ~ 6 ÷ 8 kg steam/m³ (0.374 ÷ 0.498 lb steam/ft³) is achieved

- Consequently to that, **less Vacuum requirements** and definitively **less electric consumption** are needed to run it ensuring as well **dryer block production** (less steam consumption => less stem condensation into the block = dryer block)

- Double Pre-fill Silos or automated easy cleaning Metallic Pre-fill Single Silo

- Easy cleaning multiple Silos Mixing Unit
- Dedusting Systems, implemented directly on Mixing Unit for material cleaning before filling into the Block Mould, both for virgin and recycled material
- Hydraulic Dust Compactors combined with Dust extraction on Mixing Unit to reduce the exctrated dust volume

The Dry Vacuum by Nip: a Great idea to run the Process without consuming water

- Vacuum cooling system running only with air neat exchangers on closed circuits (no more Condenser cooled by water)
- No cooling towers meaning no water evaporation as well as no issures with “legionella bacteria”
- Allowing deep vacuum levels without using large amount of water and therefore better block stabilization before ejection
- Longer life for the liquid ring standard vacuum pumps when running with Dry Vacuum System. A closed water circuit where heated water is cooled by water-air heat exchanger allows to cool the water without any evaporation. On the contrary system releases water by overflow because vacuum pumps are condensating steam and therefore the system releases water continuously with consequences that after few days of functioning the water in the circuit will be completely softened and free of calcium and magnesium salts
- Free heated air inside the factory thanks to heat exchangers: very useful in winter & in general for blocks or expanded beads stabilisation

Automated Cutting Lines for sheets

High Customization to adapt to Customer Requirements

Available for block sizes up to
8,0 m (315 in) length x 1,5 m (59 in)
width x 2,6 m (102 in) thick

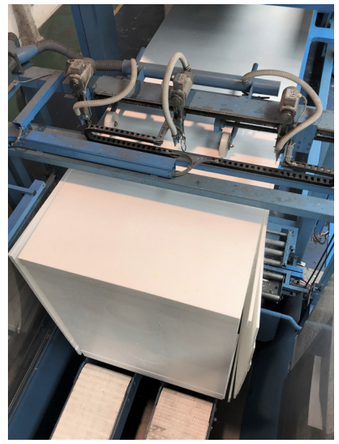
Basic

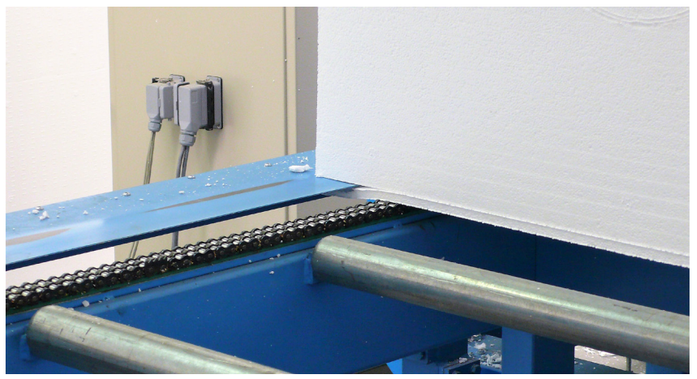
With **hot wires** and **essential automation** to ensure ordinary performances with low investment

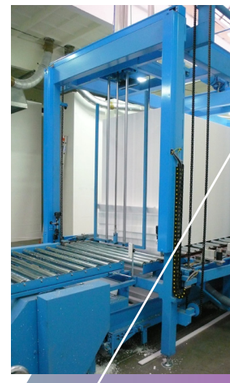
High Capacity

With **oscillanting wires** and **high level of automation** in order to Maximize the Performances

Equipped with the special “Nip High Frequency Oscillating Cutting System” which ensures 50% higher cutting speed in front of simple hot wires. Fully controllable by Recipes System. Plenty of any possible type of Automation in order to improve both the productivity and the flexibility thanks to quick changes of configuration.







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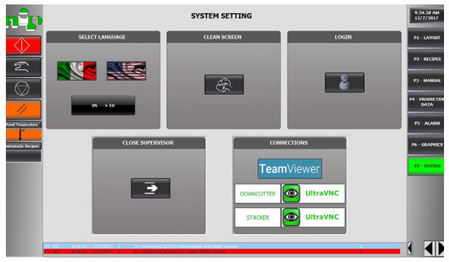
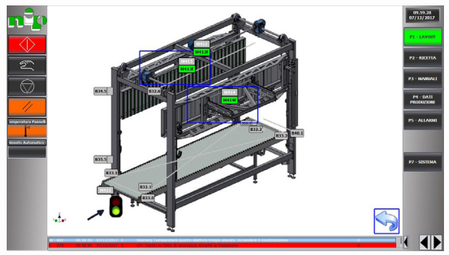




All Cutting Lines can be equipped with

- Automatic block feeding
- Automatic wire positioning on each cutting station; available for both oscillating and non oscillating cutting systems
- Full scrap collection and pre-crushing
- Label & Marking devices for finished product taking data from machine Data Base or directly from Customer Data Base
- De-stacking Systems made in many possible different ways:
  - by pushers and lifting tables (single or double) - *side separation*
  - by clamps moving up & down - *vertical separation*
  - by cartesian robots
  - by anthropomorphic robots (Fanuc or Abb brands)

  for complying whit Customer Specific Requirements
- Packing Machines (4 or 6 sides) bought from specialized Companies which are collaborating with Nip since decenniums
- Palletizers and finally Wrap Pallet Packing machines (both Vertical or Horizontal) with wood pallets or glued-wrapped eps skids

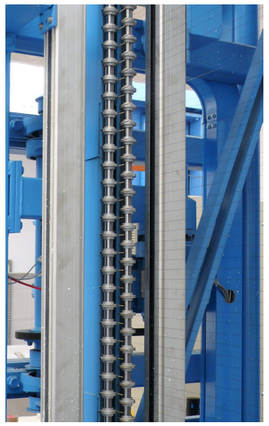
Principle of High Frequency Oscillating Cutting System

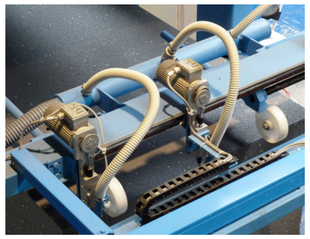
Friction between moving wires & eps creates locally additional heat which acts where needed. More friction in presence of higher densities, hard scraps and wet patches, creates automatically a heat surplus exactly there, so where necessary. This ensures much more uniform cutting conditions with consequent very nice and smooth cut sheet surface results.

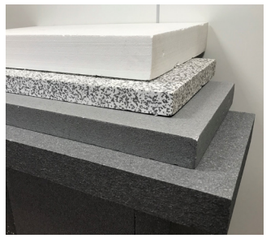
To achieve that Nip offers the following solutions for the different cutting stations:

- A double counter-oscillating cutting frame with 15 mm (0.6 in) stroke @ 1.000 rpm for the Horizontal cutting station which can hold up to 140 wries heated by a three phases transformer; the Horizontal Oscillating Cutting Head can be completed with automatic wire positioning for a high flexibility production.

- Single oscillating wires on Vertical Cutting Station and Down Cutter with frequency even higher and equal to 1.450 rpm. Oscillation is ensured by a 15 mm (0.6 in) stroke single motor for each wire. Automatic wire positioning systems are available on these Cutting Stations as too.



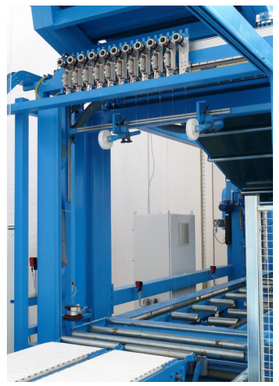




Advantages of Nip High Frequency Oscillating Wire Cutting System compared to both (*) simple Hot wires and (*) low frequency Oscillating Systems

- Minimized *picture frame effect* when cutting block containing residual humidity
- Better Cutting Speed (+50%)
- Smoother cut surface - larger advantages when cutting material containing scraps
- No wires getting dirty when cutting grey materials
- Low material burning: standard wires in use of 0,35 mm (0.014”) combined with low temperatures and Automatic Speed & Voltage Controls ensure a Max wire consumption which does not exceed 0,5 mm (0.0197 in)

This advantage gets larger when cutting thin sheets by allowing to get from the block even 3÷4 % more sheets



Achievable cutting speed with oscillating wires

Special titanium alloy wires combined with proper high tensioning springs and suitable wire cooling systems allow high cutting speed even over 3,0 m/min (10 ft/min) for low density [10 g/l - 0.62 lb/ft³] and up to 2,5 m/min (8.3 ft/min) for middle densities [16 g/l - 1.0 lb/ft³]

Details for Automatic Wire Positioning Systems on Horizontal Cutting Stations

- Double or fourfold robots for quick positioning respectively in case of single frame non oscillating wires and double frame oscillating wires

- Aluminium holding wire rings in standard version 20 mm thick (0.8”) ensures the possibility to cut sheet thicknesses down to 10 mm (0.4”) thanks to the double frame system by maintaining a very high long term precision

- Possibility of multi-thickness settings (up to 15 different) for better utilization of block thickness

- Possibility of setting inclined wires for the cutting of special sheet for flat root or equivalent Applications (also in multi-thickness configuration)

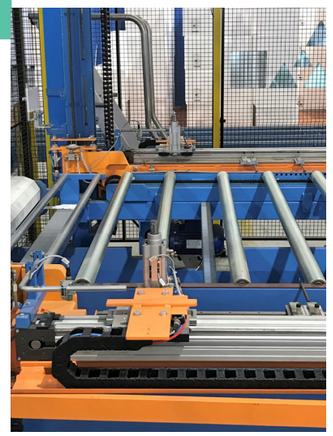
Remarkable “Special Features” of Nip Automated Cutting Lines

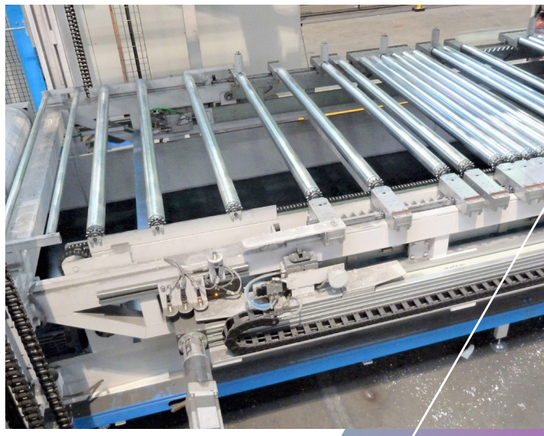
- Automatic Speed & Voltage Controls on Horizontal & Vertical Cutting Stations to adjust continuously the cutting speed (on Horizontal Cutting Station) and the voltage (on the Vertical Cutting Station) in function of local material density and characteristics (by load cells the mechanical instantaneous wire tensioning is continuously measured during cutting).
  Such Unique System ensures:
  - Max possible cutting speed automatically settled
  - Constant material consumption for uniform sheet thickness
  - Low wire break risks

- Automatic roller setting on Down Cutters to eliminate any eventual interference with the cutting wires just settled

- Automatic Cleaning Procedures and eventually double sliding upper & bottom Pre-crushers for contamination minimization at the moment of quality change between White & Grey blocks

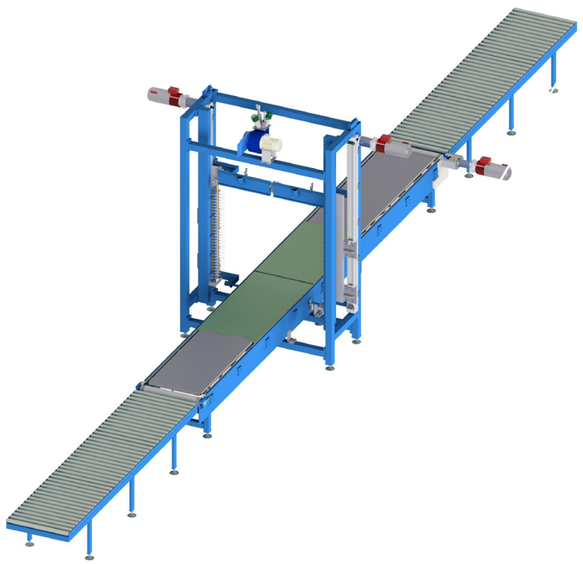
- Down Cutters upgraded for cutting as well Ship-Lap or other joint profiles on all 4 side of the sheets





Shape cutting machines

Available with 2 or 3 Axis



Standard configuration with moving belt (x axis) and up & down movable wire holding frame (y axis)

Possible as well with block laid on a fixed frame and double movement (x & y axis) holding wires frame

Fully Customizable in design, configuration and block size

- Width up to 4,0 m (158 in)
- Height up to 2,6 m (102 in)
- Length up to 8,0 m (315 in)

Completable with

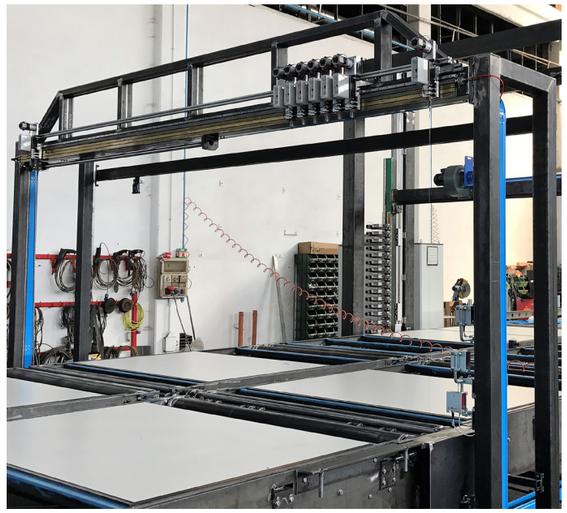
- Automatic block feeding
- Additional Horizontal Cutting Station for combined cuttings (flat-shaped)
- Additional Vertical and Length Cutting Stations
- Scrap collection

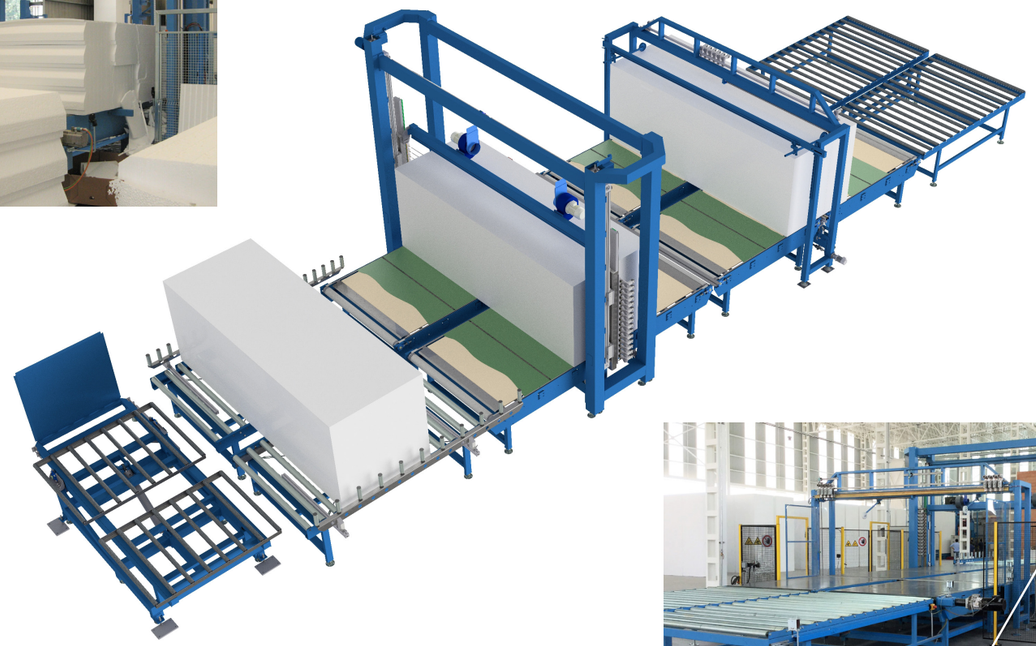
Available: Automatic wire settings

Possible: with Oscillating wires too

Special Features

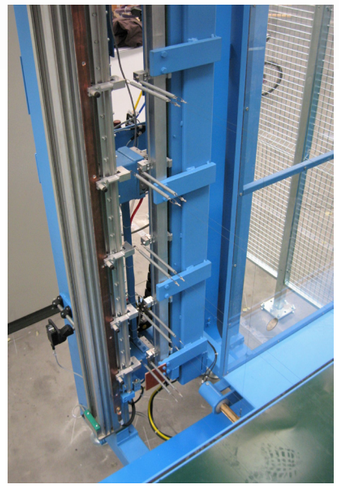
The movement now depends on **asynchronous motors** equipped with Inverter directly controlled by the same PLC that runs the normal programming of the machine: therefore both the Numeric Control and Brushless Motorizations have been eliminated. All this allows to leave unchanged the standard of precision in the movement of the conveyor belt and of the shaping wire-holder frame (X and Y axis), releasing through the machine from the use of motors and control systems of difficult availability on the market and for which is necessary the employment of purposely trained technicians in case of trouble. Machines are therefore definitively more easy to operate and maintain.

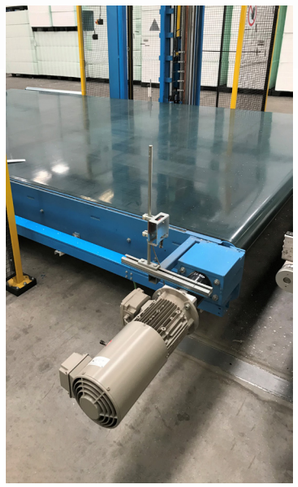




Modern and Advanced Control System

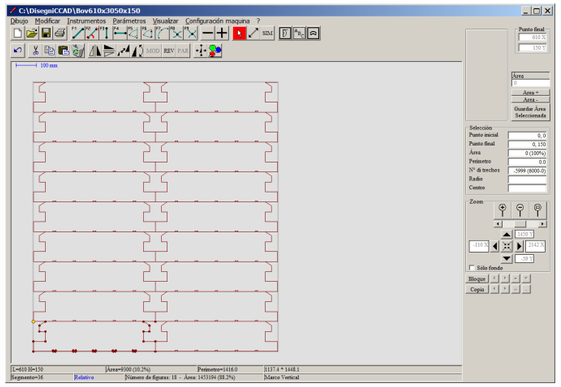
- Process Control by Recipes
- New WinCC supervision system with 19” touch screen Siemens Industrial PC with SSD
- Fully integrable with customer ERP software for controlling the production
- Remote Control for distance support





Remarkable

The software to draw called **ContourCad** installed on the machine PC has been purposely developed by the Nip engineers putting their long experience to good use in the sector of shaped cutting and trying as always to reply to the Customers’ expectations.



Some key elements of the ContourCad are

- The simplicity of use.
- The possibility of optimizing the cutting profile for reducing the scrap to minimum, through the automatic calculation of the useful volumes.
- The integration of the piece production data in the design file (cutting speed, block dimensions, density, etc.) and the information on the costs for its production.
- The storage of the data regarding the production.
- The possibility to read DXF files created with Cad standard programmes.
- The possibility to compose in an immediate and automatic way special profiles, such as writings, coverings, etc.
- The storage and fast recovery of the drawings carried out, without number limits.
- The possibility to prepare a drawing while the machine is cutting another one.
- The possibility to install the software on a PC of the office without additional costs.
- The complete compatibility with the previous Nip software versions, with the aim of exchanging design files with other existing NIP shape cutting machines.

Tongue & Groove cutting machines

For Ship-Lap and other Profiles

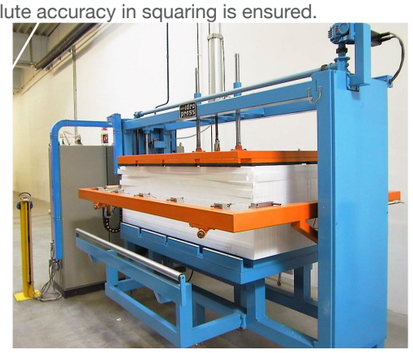
NUOVA IDROPRESS S.p.A has realized and patented an innovative system for the tongue and grooving of 4 sheet sides by means of hot wires.
By being both long and short wires instelled on the same rectangular frame which moves up & down (like a down-cutter) and horizontally at 45° it is definitively possible to calibrate properly the squareness and parallelism between the wires.
The 2 sets of long and short wires are as well installed by touching each others in the overlap positions in order to ensure to be almost on the same surface (apart of the thickness of the wire which is the only deviation from a perfect coplanarity within them). This is possible thanks to a patented innovative wire heating system wich avoids the short circuit between the short and the long wires even if these touch each others.
Pre-cut sheeets (without squaring in width and lenght) are loaded into the cutting station where thanks to the simultaneous tongue and grooving on the 4 sides without moving the sheets an absolute accuracy in squaring is ensured.

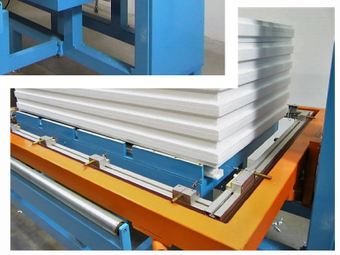
Advantages of this modern technology in front of conventional milling machines

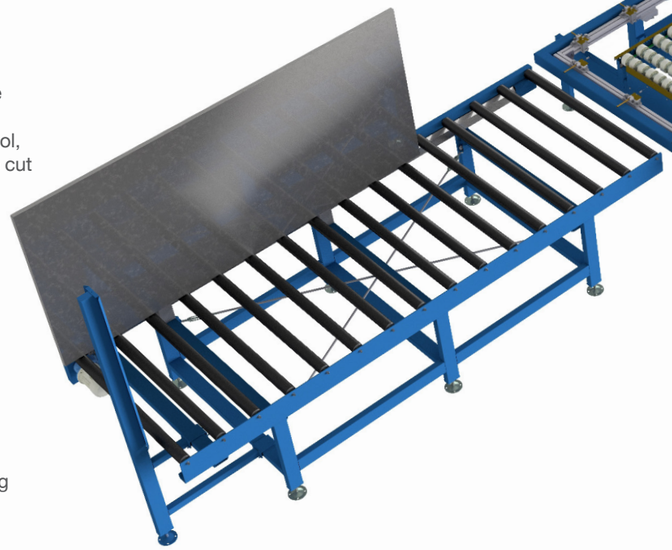
- Minimum space requirement
- Very low noise level
- Complete absence of dust in the scraps that therefore can be much better recycled
- Reduced energy consumption
- Minor investment of capitals for entering in the sector of the tongue and grooved sheets
- Considerable operative flexibility: the profile of the tongue and grooved side and the thickness of the sheet are programmed on the machine PC without changing any tool, so in addition to common Ship-Lap also other shapes can be cut

Modern and Advanced Control System

- Process Control by Recipes
- New WinCC supervision system with 19” touch screen Siemens Industrial PC with SSD
- Fully integrable with customer ERP software for controlling the production
- Remote Control for distance support

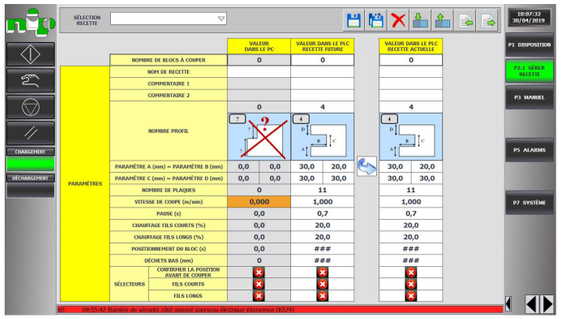






Hardware in use

As for the shape cutting machines a standard hardware is used, same type as in all NIP machines: a Siemens PLC, Siemens inverters and AC motors. No need to use custom products such as Numeric Controls, Servodrives or Servomotors. This is useful for reducing the spareparts stock and to make service to the machine easier and cheaper.



How to operate It

Regarding the programming of the profile to do shaped, the operator must only select the type of joint from the list of those available from the supervision software, and then he will be inserting the various dimensions required by the chosen profile (thickness of the sheet, measures of the various sides ...). The machine then will measure the effective height of the stack of sheets just loaded, for then proceeding with the cutting of the figure of the joint that will be repeated on the whole height of the stack taking in consideration the calculated average thickness of the sheets. It is therefore important that the sheet thickness is both uniform in the whole loaded stack as well as that each sheet has a proper planarity. Due to precision reasons, the maximum length of the stack of sheets to be shaped with this type of technology is 4,0 m (158 in).

Are available

- “Manual” simple models in which the operator loads a stack of sheets not squared in lenght and width and then the machine carries out the tongue and grooving-squaring on the 4 sides simultaneously. In this models even the operations of product unloading and scrap collection must be carried out manually.
- “Semi-Automatic” models where the tongue & groove cutting station is automatically loaded with the sheet stack previously aligned on a buffer conveyor located at the front; in the same way a buffer unloading conveyor will receive the cut sheet by optimizing the machine loading and unloading procedures. A simple horizontal cutting head con be also foresee at the inlet in order to generate the sheet stack from the loaded block and finally a bottom belt conveyor for scrap collection (manual extraction) in combination with a dedicated pre-crusher can be added to this models too.

- Models “more automated” which can be integrated inside the down-cutter of the automated cutting lines for sheets. These machines can be equipped even with systems for the automatic collection of the scraps on 4 sides (by suction devices) and further pre-crushing along the line, systems for automatic positioning of the cutting wires, etc...

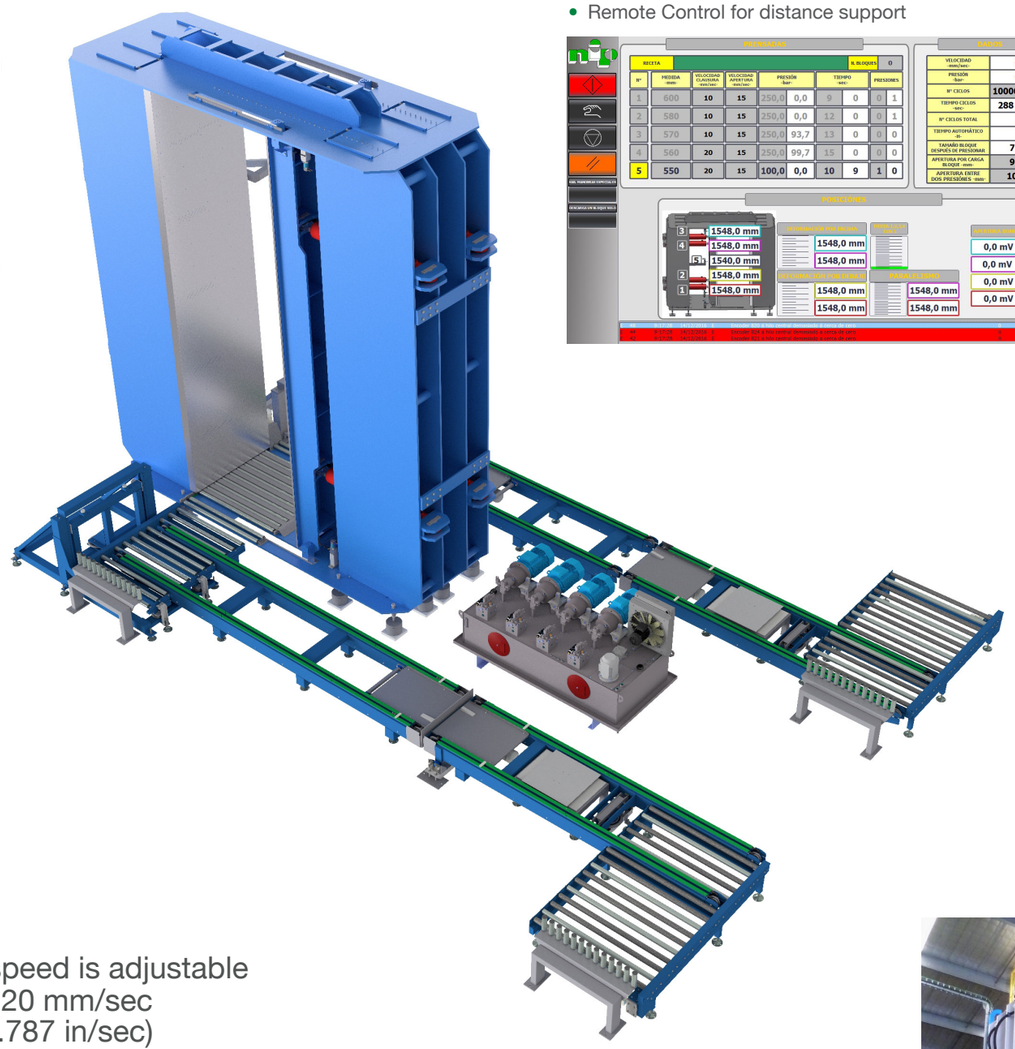
Vertical Presses for block pressing

Vertical layout machines for lower space requirements

Designed for block compression up to 85%

The Presses are specific for elasticizing EPS blocks from which obtaining sheets of low density soundproofing type called **Trittschall** (typically used in countries such as Germany and Switzerland for the soundproofing of floors) and as well at a higher density, between 15 ÷ 20 kg/m³ (0.93 ÷ 1.24 lb/ft³), in case even a certain grade of heat insulation is requested (eps sheets for application in the combined heat insulation and soundproofing of the wall surfaces).

The standard dimensions are foreseen for pressing blocks up to 8,0 x 1,4 x 2,6 m (315 x 55 x 102 in) with variable powers up to 400 metric tons (441 short tons USA) in function of the machine dimension in such a way to be able to ensure always a pressure on the block surface of at least 4 ÷ 5 kgf/cm² (57÷71 psi - lbf/in²)



Pressing speed is adjustable within 5 ÷ 20 mm/sec (0.197 ÷ 0.787 in/sec)

Opening speed is adjustable within 10 ÷ 40 mm/sec (0.394 ÷ 1.575 in/sec)

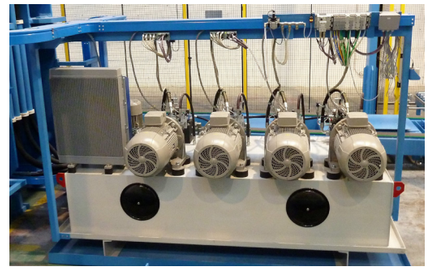
The possibility of programming **multiple pressings** with **different grades of compression** and **different speeds of pressing and opening** allows also to vary as required the compression cycles in function of the density and type of material with the aim of optimizing the acoustic insulation properties of the finished product.

Modern and Advanced Control System

- Process Control by Recipes
- New WinCC supervision system with 19” touch screen Siemens Industrial PC with SSD
- Fully integrable with customer ERP software for controlling the production
- Remote Control for distance support

Features

Machines are equipped with 4 special high pressure hydraulic cylinders acting on the 4 corners of the mobile plate and each of them receiving the proper calibrated amount of oil provided by 4 dedicated *incremental range* vane pumps though hydraulic proportional valves.



The parallelism of the mobile plate is electronically checked through 4 wire encoders (one on each corner of the mobile plate), and maintained within the acceptable tollerances by the sophisticated hydraulic proportional system that is adjusting the amount of oil provided to each cylinder and consequently the speed of each cylinder.
This Advanced Technology of Control allows the machine to compress, in an effective way with no need of adjustments and without consequences on its mechanical apparatus both blocks with remarkable density variations and blocks with height and width smaller than the Maximum admitted by the machine (in case of height even down to half !) ensuring an easy and flexible machine operation.

Block Loading and Unloading Automated Systems are available to be combined with the Presses in order to answer to each Customer specific requirements of block handling in this specific step of the process.

Presses are also used to de-tension blocks after cooling in the storage allowing to eliminate the sheet/stripes deformation after cutting (useful for applications where high flatness is required).

De-tensioning Pressing process must be orientated in function on how the block is then cut in the subsequent cutting process.

Possible to manufacture very flexible machines which can press the block in any direction, useful especially for small compression de-tensioning procedures (≤ 10 ÷ 12% compressions) in function on how then the block has to be cut.

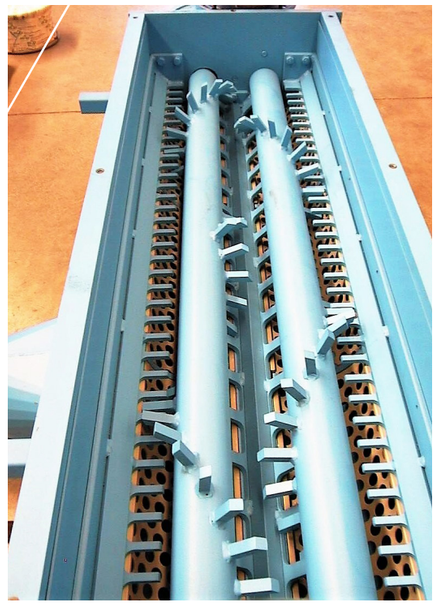
Recycling Equipment for waste of eps

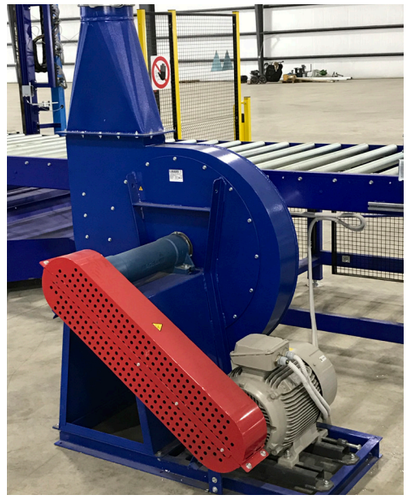
For internal scraps and eps waste collected outside. It allows to re-use the material (thanks to a proper treatment) in a profitable way

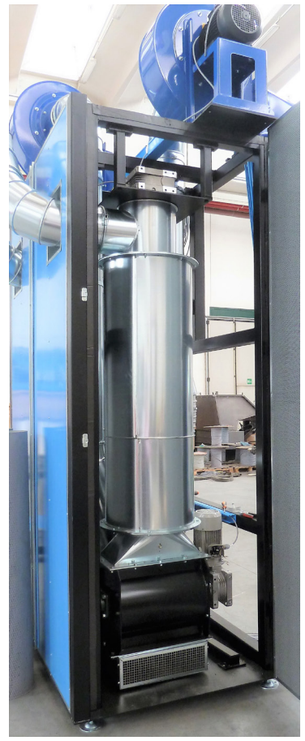
Available in different combinations of capacity within 15 ÷ 100 m³/h (530 ÷ 3,530 ft³/h)

First Step: Crushing

Low revolution speed Pre-crushers & Grinders for low noise and low dust generation. Grinding Fans for further size reduction when necessary to go below 10 ÷ 12 mm (0.39 ÷ 0.47 in) diameters.
Suitable for densities within 6 ÷ 80 kg/m³ (0.37 ÷ 5.00 lb/ft³).
Possible to complete with automatic feeding conveyor belts for a faster filling.







Second Step: Dedusting

Material cleaning from any eventual dust contents is a very important passage before recyclying the crushed eps waste back to block or shape moulded parts in order to keep the moulding machines clean and therefore in order to ensure proper quality of block and moulded parts containing recycled eps waste.

Dedusting Process can be done both with

- Standalone Machines to be placed (*) after a Grinder or Grinding Fan (*) after a collecting silo for ground waste on the pipeline to moulding machine (block mould or shape mould).

- Integrated Devices installed directly on Mixing Unit in front of block mould or shape mould so that during mixing process the materials (eventually virgin material as well - useful f.e. in case of grey materials which may contain dust) get cleaned by being the dust extracted and separated. Dust is then compacted by using a large variety of Hydraulic Dust Compactors

Third Step:
Mixing to virgin beads

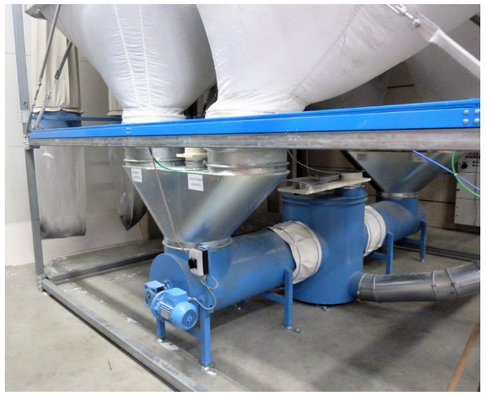
For feeding back the block mould or the shape mould with mixed virgin and recycled materials

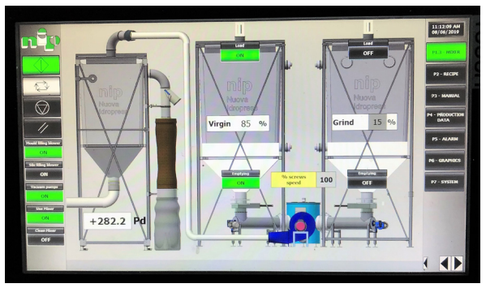
Mixing Units can be provided based on

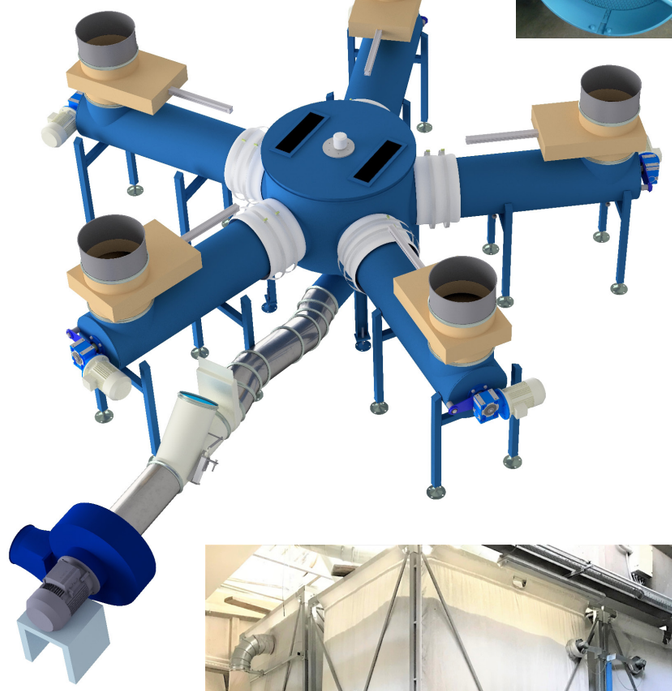
- Archimedean Screws ensuring a continuous flow and therefore a well-mixed material (Nip preferred solution); eventually available with more than two Archimedian Screws and up to 5 together for mixing as well white & grey virgin materials + scraps from white, grey and “dalmatian” (mixed white & grey) for such special application (dalmatian eps)

- “Rotary Sector Valves”

Both controlling the revolution speed by inverters in order to adjust the %’s of the different materials and suitable to be integrated eventually in the block mould supervision recipe system



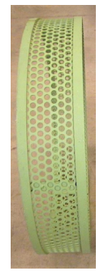




Are available

- **Pre-crushers:** – Max scrap thickness 500 ÷ 600 mm (20 ÷ 24 in)
  – Sieve diameter 80 mm (3.15 in)
  – **Output:** ○ **type A** 25 ÷ 35 m³/h (880 ÷ 1,240 ft³/h)
  ○ **type B** 32 ÷ 45 m³/h (1,130 ÷1,589 ft³/h)

- **Grinders:** – Max scrap thickness 120 ÷ 150 mm (4.7 ÷ 5.9 in)
  – Sieve diameter 15 ÷ 30 mm (0.59 ÷ 1.18 in)
  – **Output:** ○ **type A0** 10 ÷ 15 m³/h (353 ÷ 530 ft³/h)
  ○ **type A** 15 ÷ 20 m³/h (530 ÷ 880 ft³/h)
  ○ **type B** 20 ÷ 30 m³/h (706 ÷ 1,059 ft³/h)



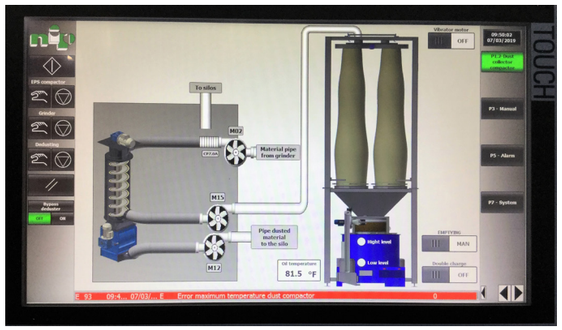
- **Grinding Fans after the Grinders:** – sieve diameter 15 ÷ 6 mm (0.59 ÷ 0.24 in)
  – **Output:** ○ **type A** suitable for Grinder type A0
  ○ **type B** suitable for Grinder -> A & B (in function of sieve diameter)

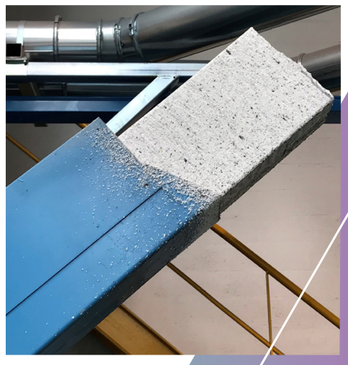
- **Dedusting Plants** - Standalone Machines: – **Single:** ○ **type A0** output 15 ÷ 16 m³/h (530 ÷ 565 ft³/h);
  ○ **type A** output 35 ÷ 40 m³/h (1,236 ÷ 1,412 ft³/h);
  ○ **type B** output 45 ÷ 50 m³/h (1,589 ÷ 1,766 ft³/h);
  – **Double:** ○ **type D** output 110 ÷ 120 m³/h (3,884 ÷ 4,238 ft³/h);

- **Hydraulic Dust Compactors:** – High density at output between 300 ÷ 500 g/l (18.7 ÷ 31.2 lb/ft³)

  – **Only for Dust:** ○ **type A** output 0,58 m³/h (20.5 ft³/h) compacted material Ø 60 mm (2.36 in)
  ○ **type B** output 0,82 m³/h (29 ft³/h) compacted material Ø 65 mm (2.56 in)
  ○ **type C** output 1,80 m³/h (64 ft³/h) compacted material Ø 70 mm (2.75 in)

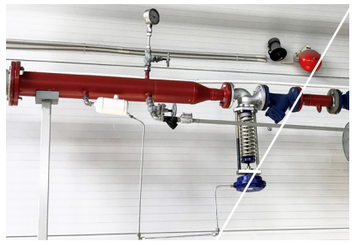
  – **Both for Dust and Scraps:** ○ **type C+** output 3,0 m³/h (106 ft³/h) compacted material Ø 75 mm (2.95 in)
  ○ **type D** output 4,5 m³/h (159 ft³/h) compacted material □ 135 x 250 mm (5.31 x 9.84 in)
  ○ **type E** output 15,0 m³/h (530 ft³/h) compacted material □ 215 x 350 mm (8.46 x 13.78 in)





Turnkey Plants & Automatic Block Storage by LGV

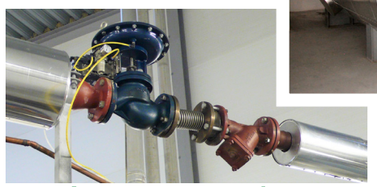
In case a complete New Factory has to be built

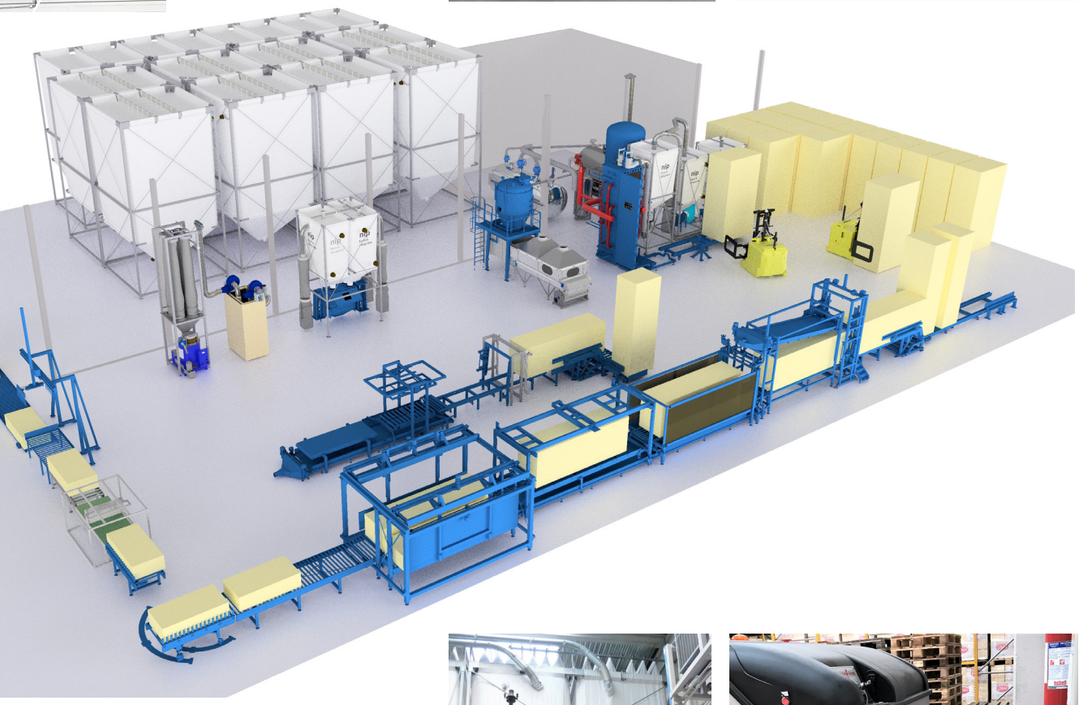


Nip can either:

- Just make a Study for dimensioning all Utilities referring to **Steam** (Boiler size, Steam Accumulator size, all Valves and Pipelines list and size) & **Compressed Air** (Compressor size and Project of the whole system).
- Or directly Supply from Italy all these Components eventually already pre-installed for a quick mounting at the new Facility.

It's really important to keep in mind that proper **Steam Supply** is basic for ensuring a proper functioning of block mould and pre-expander which are definitively the Heart of an eps Factory.



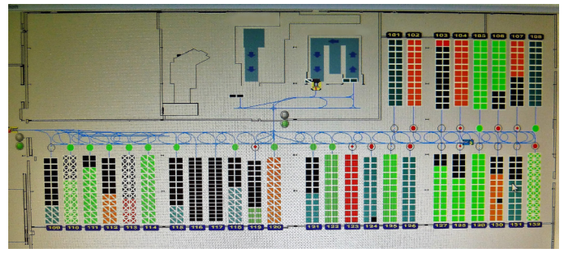


Automatic Block storage by LGV

A state of Art Factory for eps blocks & cut products can be really optimized with a **Laser Guided Trolleys (LGV)** System for handling the whole block flows in a total automatic way. Equipped with forks or / and clamps can be also employed for the automated handling of finished products (piles or stacks of eps sheet packets) at the end of the cutting line to finished product storage. The main application remains anyway the block handling from Block Mould to block storage, from this eventually to Block Press for an intermediary passage and back to storage, and finally from block storage to Cutting Machines. One or more trolleys handled by a Unique Supervision System in function of Factory configuration.

Features of Automatic Block Storage by LGV

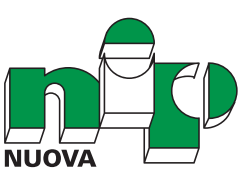
- Computerized available dynamic storage status for blocks & finished product in real time



- Automatic data handling from block production through intermediary steps (block pressing) up to cutting for a full production traceability
- Automatic monitoring of intermediary block seasoning times and consequently, availability to further steps of the process
- Possibility to make automatic re-order procedures of block storage for compacting it and releasing space for further productions
- Equipped with 360° Laser Scanners to monitorize all around during its translation in order to be even installed on an area where humans can walk, keeping proper Safety Conditions

... & Advantages

- It saves operators costs for driving fork lifts; especially when operating several shifts / day
- It saves human mistakes in material handling
- Able to run 24 / 24 hours thanks to an automated re-charging process. The trolley goes to recharge in automatic on a suitable station as soon as it has available time. It returns to work as soon as is needed
- Flexible, because it does not require any guide or rail on the floor apart a suitable concrete flat surface which allows therefore to redesign at any time the storage configuration by simply acting on the supervision software which handles the System



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