

## **BUILDING & CONSTRUCTION** **BOZZA-PRELIMINARE**

# CONTINUOUS PRODUCTION LINES FOR SANDWICH PANELS

## **FOAMING & INSULATION TECHNOLOGY**

- Continuous Lines for Large Productions
- Tailor-made Design & Configurations
- Rigid & Flexible Facing



**ITE** (Italian Technology Equipment)  
Piazzale Medaglie d'oro 1 ,  
20135 Milan – Italy  
Tel. +39 02 90 639 820  
info@itenetwork.it



# FOAMING & INSULATION TECHNOLOGY

## Sandwich Panels for Building & Construction



Rigid polyurethane foam with its ideal strength to weight ratio, thermal and acoustic insulation properties, durability, and unmatched versatility, ensures high performance and exceptional energy efficiency in a wide range of applications: building, warehouses, prefabricated structures, roofs and walls, sectional doors, ducts and air conditioning systems, soundproofing cabins, cold stores, walk-in-coolers, pipes network for water/oil/heating distribution.

### ITE (Italian Technology Equipment)

supply the building and construction industry with a wide range of proven reliable, economically and technologically advanced solutions based on discontinuous and continuous methods for the production of insulated boards, sandwich panels and insulated parts. The decision to choose one technology over another is mainly due to the production volume required, to the part complexity and to the level of investment.

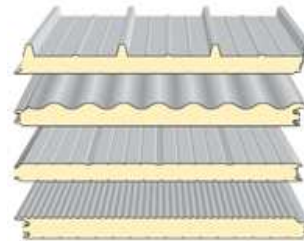
### ITE (Italian Technology Equipment)

design and offer a worldwide basis, anything from single stand-alone units up to complex and fully in-house manufactured plants with high degree of integration, technological synergies and automation (automatic loading system for raw materials, handling systems and packaging equipment for finished products, turntables and carousels, premixing units, chemical storage).

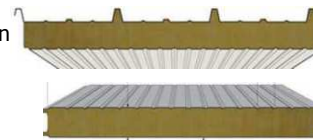
When manufacturing complex "turn-key" foaming systems

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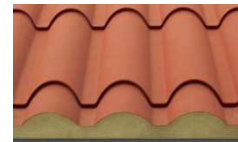
adopt modular development criteria to offer unbeatable flexibility during configuration. This choice also means that the actual line can be expanded at a later stage with the addition of extra modules.



PUR/PIR panel



Mineral wool panel



Roof tile panel



Cold store panel



Sectional door panel



## CONTINUOUS PRODUCTION LINES FOR SANDWICH PANELS

The ever-growing demand for insulated panels in building applications is driven by the new energy-saving regulations imposing significant reductions on power consumption, that can be achieved by the thermal insulating properties of the materials used.

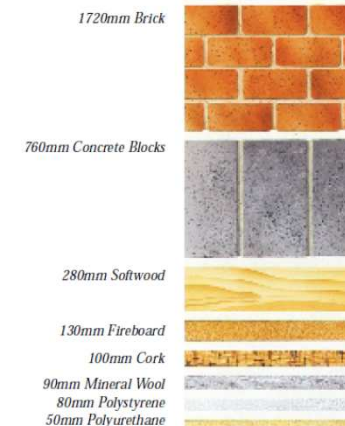
Sandwich insulated panels can be produced with a maximum thickness of 250 mm and either flexible (paper, cardboard and felt, centesimal aluminum sheet, etc.) or rigid facing (metal sheet, GRP, etc.) and using different types of insulating materials: polyurethanes, PIR, mineral wools, glass wool

Panels with rigid or flexible facing can be part of the building structure and in many cases substitute traditional constructive materials offering better thermal and acoustic insulation properties.

These panels improve the look and utility of the building as well as its speeding-up construction and reducing the amount of expensive wood necessary for structural frames, saving time and energy and protecting natural resources as well.

Dedicated presses and foaming plants for the manufacture of curved panels are also available. Typically a sandwich curved metal panel insulated with polyurethane and internal micro-ribbed liner is used either as new roofing elements or for the replacement of fiber-cement slabs.

The continuous thickness of the polyurethane insulating material provided an excellent barrier against the dispersion of heat in winter and the entry of the sun's rays in summer, giving the panel a pleasant, elegant appearance.





## Sectional & Garage Doors

**S**ectional doors and garage doors are another interesting application niche where sandwich insulated panels are successfully applied. The sectional door comes from a simple and effective concept that consists of dividing the door into panels to be lifted and lowered vertically or moved horizontally, making it modern-looking (attractive doors with various styles, shapes, profiles, finishing and color options), extremely practical with the great advantage of a reduced space required for the opening/closing phases. Commercial sectional door and residential garage door panels can be shaped with an attractive stucco embossed painted profile, natural look wood grain style, embossed surfaces, with shadow lines for added strength.

The panels are produced in both continuous and discontinuous processes: the result is a solid and aesthetically pleasing sandwich strong enough to bear commercial abuses. Foamed-in-place PU insulation is highly efficient giving these panels twice as much energy efficiency as polystyrene

## CONTINUOUS PLANT FOR INSULATED SANDWICH PANELS



The increase in production volumes and the variety of possible applications demands a higher production capacity. For these reasons continuous laminators are the best – and sometimes the only - possible alternative solution for large-scale production. Roof and wall panels are made mainly of a metal section support and a polyurethane insulating core , which assure a double barrier, one against corrosion and the other against thermal dispersion. Therefore elective components, like zinc or paint coated sheets, are chosen to offer an effective barrier against atmospheric agents; the same for polyurethane or polyisocyanurate (PIR) foams, the most efficient thermal insulators against heat transmission.

**ITE (Italian Technology Equipment)** supports the customer with dedicated and tailor-made, on-the-job training courses. On request, training sessions can be organized at a production plant where on a daily basis the customer's operating staff will work in close contact with our specialist in order to achieve a correct and optimal know-how transfer.



## Acquisition data and production control

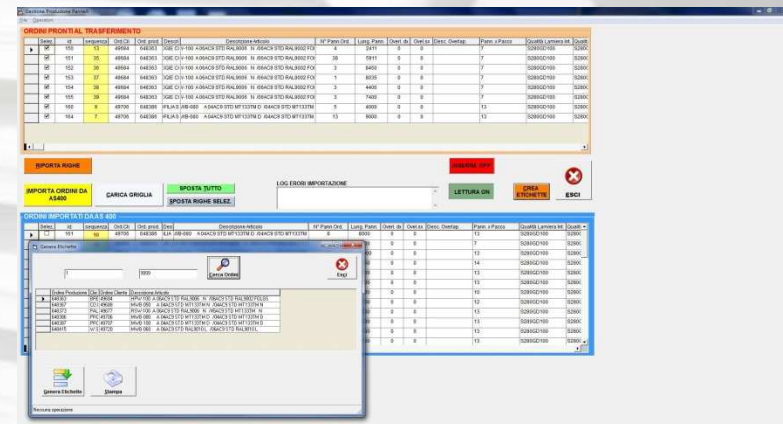


**ITE Production and Quality Control System** helps the process optimization and the management of the continuous production line. The software is used both for the input of production data in the different areas of the line, both for the record and analysis of the production data, avoiding hand-picking of data by workers and employees and their elaboration.

**ITE Production and Quality Control System**, enables the full traceability of the production data and, with the data thus collected, provides timely information on the production trends and on the corrections to be made to optimize processes and thus save time and money.

**ITE Production and Quality Control System** is divided in the following items:

- A) Acquisition and monitoring production data
- B) Processing data for analysis and statistics
- C) Production order to be transferred to the production line



## Unwinding Unit

**U**nwinding group is usually composed by four decoilers, two for the upper profile feeding and two for the lower one, which are equipped with an automatic loading and positioning system of the coil on the relevant mandrel (two is the minimum possible configuration).

The coilers are usually arranged in pairs in order to achieve fast production changes. When one coil is working the second one can be set for the new production



## For Mineral Wool Insulation

Rock wool panels are specially designed and require to meet "fire safety" requirements both for the construction of new buildings and the renovation of existing premises. When the insulation material is not self-adhesive, i.e. mineral wool, the equipment for sheet forming and panel cutting will not change, while in parallel to the metal profiling group, dedicated devices are integrated for mineral wool mattress loading, cutting (either in-line or off-line), handling and glueing





## Roll Forming Machine

Profiling line for wall panels complete with micro ribbing device to shape the rigid facing and form the junctions. Roof panels require deeper ribs and a dedicated set of forming rolls for the external sheet layer.

The main feature of the roll forming equipment is the number of roller holder shafts, which is related to the profile to be obtained. The system is designed for fast replacement of the forming rolls (cassette system). Typically the group is based on a two-levels configuration to separately profile the lower and upper layers.



## Pre-Heating Tunnel

This keeps the formed sheets at a desired temperature in order to achieve good foam adhesion and the final quality of the sandwich panel.

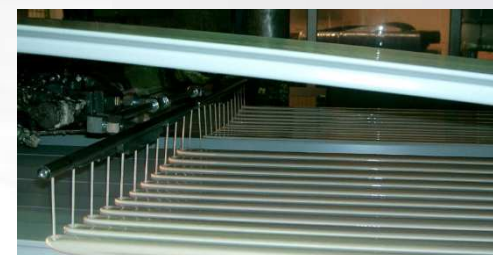




## Dosing, Mixing & Foaming

A high-pressure multi-component dosing unit (number of components according to chemical formulation) equipped with mass flow transducers and double diaphragm pumps. When hydrocarbon-based blowing agents (i.e. Pentanes) are used, the whole foaming equipment is specially configured with dedicated raw material storage, premixing unit, explosion-proof devices and active ventilation system to ensure the maximum safety.

The foamed insulating material, polyurethane, PIR-is poured by means of a dedicated mixing head assembled and driven by a bar that slides transversally over the panel, giving optimal foam distribution or by a fixing mixing head with special poor bar.





## Double Belt Conveyor



The double belt conveyor represents the most important part of the line. It consists of two conveyor belts aligned one above the other and capable of contrasting the pressure generated by the foam reaction and ensuring a perfect flatness.

The gap between the two belts is adjustable, allowing the processing of panels with different thicknesses. In order to obtain an optimum PU polymerization, the upper and lower sections are independently heated.

The **ITE (Italian Technology Equipment)** double belt is fully designed with an innovative drive fitted to the conveyor: two independent electric motors operate two endless screws mounted above and below the two belts.

## Cutting Equipment

Leaving the double belt conveyor, the sandwich panel enters a sound-deadened cabin where the cutting machine **cuts** the finished panels to the desired length. The cutting group (available with single or double configuration) can be supplied with disk or band saw.



## Handling Systems Cooling section

To avoid heat accumulation bulges, thus preventing wavy surfaces, bulges, foam tears and scorching; the high thickness panels need to be properly cooled before stacking.





## Stacker machine

The automatic stacker installed above the entrance bench, picks up the panel from the bench or from the tilter and it places the panels on the conveyor stack.



## Packaging machine

The stack is transported by the entry conveyor to the wrapping machine and automatically it will be wrapped with extensible polyethylene .





## Electric and electronic equipment

Particular attention is given to the design , verification and testing of the electrical equipment with the full correspondence between the requirements of the project and the performance requests.

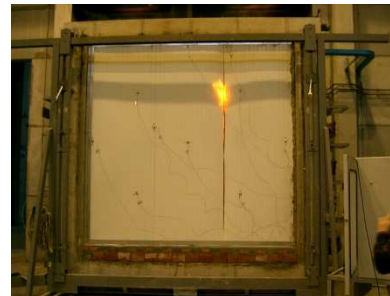
The electrical equipment are manufactured with the best components available on the market, using all the most popular brands in compliance with the most stringent specifications.

To give immediate assistance to the customer, the ITE (Italian Technology Equipment) continuous production line are equipped with a monitoring system and remote control via router / firewall completely secure (remote assistance)



## Tank Farm

Being a solution provider as well as a worldwide supplier of complete plants, **ITE (Italian Technology Equipment)** is also able to offer a full package that includes chemicals and hydrocarbon blowing agent storage equipment. **ITE (Italian Technology Equipment)** satisfies a wide range of customer's requirements: from simple chemical bulk storage, up to polyol/pentane blend storage, small bulk storage for hydrocarbons, complete pentane storage systems. In particular, concerning the storage of hydrocarbon blowing agents, in the case of pilot plants or small production lines, storage containers can be installed immediately outside the production building in a naturally ventilated area protected against the sunlight by a cabinet. This open-air system is easy to inspect and maintain.



### Fire Reaction

The Fire Reaction is the degree in which a material resists to the combustion and it is evaluated according European Standard o FM Approval or other national regulation.

### Fire Resistance (REI or EI)

The Fire Resistance is the capability of the building element to retain the integrity of the thermal insulation for a period of time. The performance of panel systems when tested is expressed in minutes from ignition to the conclusion of the test, which is determined as the failure point at which the panel ceases to comply with the requirements of the specific test.

