OMS Group Profile

Impianti OMS was founded in the late 60's during the expansion of the polyurethane foam industry. Its aims were to manufacture continuous production lines for flexible polyurethane foam block together with dispensing machines of two or more components for moulding flexible and rigid PU foam of various densities. In less than 20 years **Impianti OMS** has now reached a leading position in its market sector.

OMS Group is now a principal European Company ranking amongst the leading world manufacturers of polyurethane processing machinery and integrated manufacturing plants and is an industry standard for anyone wishing to come into contact within this particular sector of activity.

OMS Group has been developing since the start of its activity and now covers a total factory area of 8,000 sqm with a total work-force of 150 employees, achieving a high percentage of exports as part of its annual turnover (80%).

OMS Group has always paid particular attention to environmental issues, technical innovation, cost effective solutions, product quality and quality control standards.

Its production range covers both high and low pressure machines, presses, standard and specially designed turn-key plants for all various applications (domestic and industrial white appliances, continuous and discontinuous sandwich panel lines, foam block plants, automotive, filters, elastomers, TPU and miscellaneous) and is able to satisfy the several and different requirements and needs of both customers and markets.

Our high tech computerized equipment ensures that all "critical" components are produced to the highest levels of accuracy, reliability and quality and continuous re-investment in tooling and machinery will enable us to further improve our production range.

OMS Group production technology is evolving continuously to be constantly in tune with market demands and in 1983 Impianti OMS has diversified its activities in synergetic industrial fields becoming the Holding Company of an engineering group specialized in plants, control and equipment for the manufacturing industry.

Impianti OMS: holding company, with design and engineering department with a dedicated factory manufacturing the broad spectrum of processing equipment and integrated plant.

Cerom: electronics division, producing dedicated microprocessors based controllers, general plant control equipment and application software.

Thanks to this flexible organizational structure, **OMS Group** is able to follow from the very beginning all the stages involved in the design, manufacturing, in-house testing, installation and commissioning of machinery within its range of production and can grant its international clientele a sound and prompt after sales service network ready to trouble-shoot and solve any problem that may be encountered.

To better service our strong Chinese customer based, **OMS Group** has opened a direct local office in Shanghai, with a commercial and technical branch office in Beijing. This will overcome any logistical problems due to the geographical distance of the holding company, **Impianti OMS SpA**, based near Milan, Italy.

For the high quality standards it has achieved, **OMS Group** has been awarded ISO 9002 certification assessing its quality system in compliance with UNI EN 9002 rules which is recognized by the international EQNet body and has recently been re-awarded ISO 9001:2000 certification assessing its European quality standards.

Reference List for Continuous Sandwich Panels:

	Year
ISOPAN Italy Metal faced line with 30-32m conveyor	1975
ITMPCMP Romania Flexible substrata line with 12m conveyor	1978
OBNOVA LISTICA RADNA Former Jugoslavia Metal faced continuous line with 30-32 m conveyor	1980
Jediustvo Krapina Former Jugoslavia Metal faced line with 20-22 m conveyor	1980
SITI Italy Flexible substrata line with 20-22 m conveyor	1981
ISOMAR Italy Flexible substrata line with 15 m conveyor	1981
PITRE Italy Flexible substrata line with 20-22 m conveyor	1984
Tianrong Bldg Elements China Metal Faced Line With 30-32 Mr Conveyor	1985

ISOLPARMA
Italy
Flexible substrata line with 14-16 m conveyor 1987

Dongshin Special Steel
Korea
Metal faced line with 22-24m conveyor for Pu and Phenolic 1988

Yeon-Hab Insupanel
Korea
Metal faced line with 30-32m conveyor for Pu and Phenolic 1989

Color Profil
Belgium
Flexible substrata and metal faced line with 20-22m conveyor 1991

ICI
Italy
Flexible substrata laboratory line with 3m conveyor using pentane as blowing agent 1992

RECTICEL
Belgium
Flexible substrata line with 30-32m conveyor using pentane as blowing agent 1993

BARLAN
Turkey
Metal faced line with 20-22m conveyor 1993

Kunming Windows Steel
China
Flexible Substrata And Metal Faced Line With 14-16 Mt Conveyor 1994

ICI
Italy
Flexible substrata and metal faced for laboratory line with 6m conveyor using pentane as blowing agent 1995

Profilcastello
Italy
Metal faced line with 14-16m conveyor 1995

BAUDER Gmbh
Germany
Flexible substrata line with 20m conveyor using pentane as blowing agent 1995

BARLAN
Turkey
Metal faced line with 30-32m conveyor using pentane as blowing agent 1996

Duk Yu
Korea
Metal faced line with 20-22m conveyor 1996

PITRE
Italy
Embossed aluminium flexible substrata line 1997

NUH
Turkey
Metal faced line with 20 m conveyor 1997

UNILIN
Belgium
Wooden panel line with 20 m conveyor 1998

BARLAN
Turkey
Plant for continuous metal sandwich panels production with mineral wool process 1998

REFTRUCK
Egypt
Metal faced line with 14-16 m conveyor 1998

METALLEMPORIKI
Greece
Metal faced line with 20 m conveyor 1998

FIRESTONE
Jacksonville - U.S.A.
Polyol-pentane metering line with pertaining pre-mixing plant modifications and additional items for plant pentanization 1999

FIRESTONE
Wisconsin - U.S.A.
Flexible substrata faced line with 30 m conveyor using pentane as blowing agent and polyol-pentane high pressure metering line with pertaining pre-mixing plant. 1999

STEADMANS
UK
Plant for continuous metal sandwich panel production with pentane; sheet heating oven, 15 m double belt conveyor, disc cutting machine, high pressure foaming group, polyol/isocyanate and pentane storage tanks 1999

FIRESTONE
Covington, ky - U.S.A.
Polyol-pentane metering line with pertaining pre-mixing plant additional items for plant pentanization 2000

FIRESTONE
Youngwood - U.S.A.
Polyol-pentane metering line with pertaining pre-mixing plant additional items for plant pentanization 2000

FIRESTONE
Salt Lake city - U.S.A.
Polyol-pentane metering line with pertaining pre-mixing plant additional items for plant pentanization 2000

XTRATHERM
Ireland
Flexible substrata faced continuous plant with 30 m conveyor using pentane as blowing agent, with multi-component high pressure foaming machine 2000

Marcegaglia
Italy ·
Pentanisation of n.2 existing continuous metal lines 2000

NEVECOR
Venezuela
Flexible substrata faced continuous plant with 12 m conveyor, with low pressure foaming machine 2001

EFISOL
France
Flexible substrata faced continuous plant with 20 m conveyor using pentane as blowing agent, with multi-component high pressure foaming machine 2001

FIRESTONE
Denver - U.S.A.
Polyol-pentane metering line with pertaining pre-mixing plant additional items for plant pentanization
2001

FIRESTONE
Bristol - U.S.A.
Polyol-pentane metering line with pertaining pre-mixing plant additional items for plant pentanization 2001

ISOBAU HELLAS
Greece
High pressure machine at 4 components (polyol - isocyanate - catalyst and pentane) for the continuous production of metal sheet sandwich panels 2001

KINGSPAN
UK
Flexible substrata faced continuous plant with 38 m conveyor using pentane as blowing agent, with multi-component high pressure foaming machine 2002

METALLEMPORIKI
Greece
Up-grading of continuous plant 15 m length 2002

POLIURETANOS
Spain
Polyurethane panels with flexible substrata continuous production plant with 30m double belt conveyor 2002

KINGSPAN
Ireland
Polyurethane panels with flexible substrata continuous production plant with triple Hp machine with 3 mixing head and pentane metering line 2002

EUROTHANE
Ireland
Polyurethane panels with flexible substrata continuous production plant with 15m conveyor using pentane as blowing agent with multi-component high pressure metering machine 2002

KINGSPAN
UK
4th line for polyurethane panels with flexible substrata continuous production plant with 38m conveyor with multi-component high pressure machine 2002

RECTICEL
Belgium
Polyurethane panels with flexible substrata continuous production plant with special triple high pressure metering machine (polyol, isocyanate, catalyst and air-mix) with 3 mixing heads for high speed lamination and pentane metering line.
2002

STEADMAN
UK
Double belt conveyor elongation 30m. 2002

FIRESTONE
Dallas - USA
Polyol-pentane metering line with pertaining pre-mixing plantAdditional items for plant pentanization 2003

EFISOL
France
Modification of existing plant, adding 3 fix heads 2003

KNAUF
France
Flexible substrata faced continuous plant with 22,5 m.
Conveyor using pentane as blowing agent, with multi-component high pressure metering machine·
Paper decoilers·
Pouring plane·
In-line cutting machine ·
Double vertical cooling conveyor
2003

P3
Italy
Flexible substrata faced continuous plant with 15 m.
Conveyor, with low pressure metering machine·
Cutting unit at blade exhaust plant 2003

RECTICEL
Belgium
High speed lamination plant 60m/min
Double belt conveyor 38 m. Length
Auto-positioning of upper conveyor belt
Tapered boards production facilities: 60 mm side to side inclination
Double belt conveyor heating system: +80°c
Covering tunnel and safety system for double belt conveyor 2004

METALLEMPORIKI
Greece
Plant for the production of panel with mineral wool
Double belt conveyor length 23 m.
Band saw cutting unit 2004

HEMSEC
United Kingdom
Plant for continuous metal sandwich panel production with pentane
Sheet heating oven
Double belt conveyor 15 m. Length
Disc cutting machine
High pressure metering group, polyol - isocyanate - and pentane storage tanks 2004

Issued June 2004

Production Technologies for Continuous and Discontinuous Panels Lines

The application of polyurethane foams in the industrial and building insulation fields is one of the leading production sectors in which OMS Group has invested considerable time and effort. Thanks to their particular properties and their versatility, rigid polyurethane foams have become widely used in these application fields.

The production process adopted to produce panels are divided into:

1. **Discontinuous Process**
2. **Continuous Process**

1. Discontinuous Process

OMS Group has a long acquired experience in producing discontinuous sandwich panel production lines, paying particular attention to technical requirements of the final end-users.

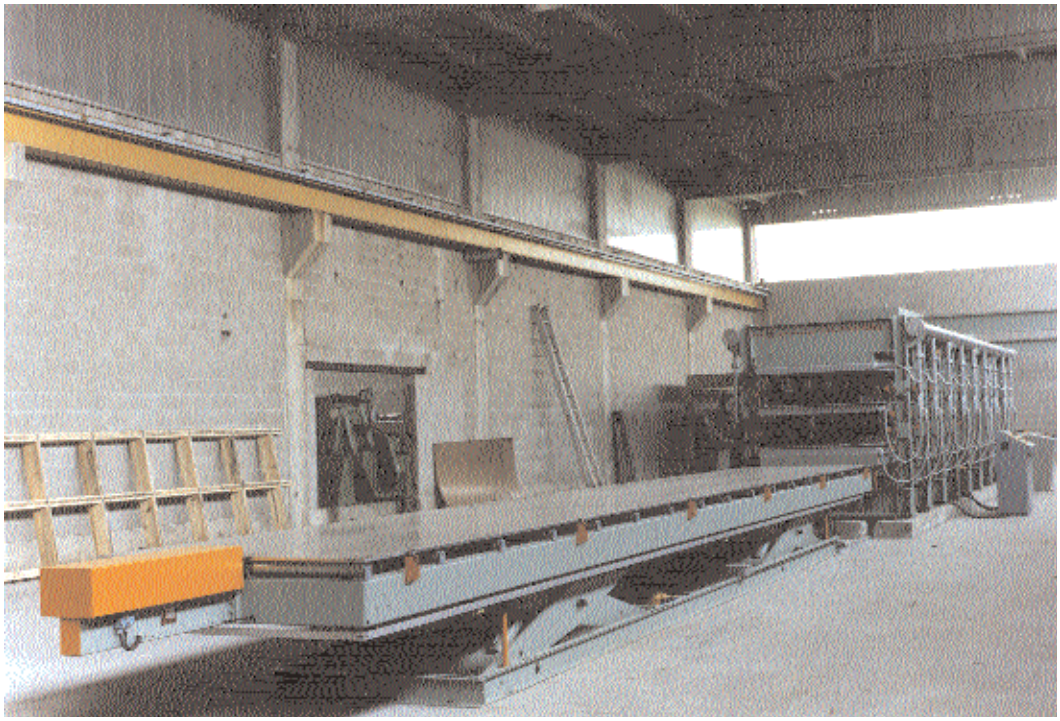
Our modular approach to both customers and markets demand resulted in a series of machines range, with particular accent on our high pressure metering machines and integrated polyol/blowing agent mixing systems, capable of working with several blowing agents alternative to "Freon 11" .

Choosing a discontinuous panels production plant is mainly dictated by either working production parameters and type of panels to be produced. Usually, this production process is mainly for small scale production or for the production of special panels.

In the discontinuous process it is possible to produce panels up to 14m length with thickness reaching 200mm; standard width for the building sector is generally about 1m whereas for the walk-in cold rooms and refrigerated containers can reach 2.5m length.

Such panels -either rigid of flexible, with flat or grooved profile- can be produced using different types of substrata, the most common being paper, aluminium, steel and pre-painted metal sheet.

OMS Group
Polyurethane Evolution



Diverse technologies apply to the discontinuous production process, namely:

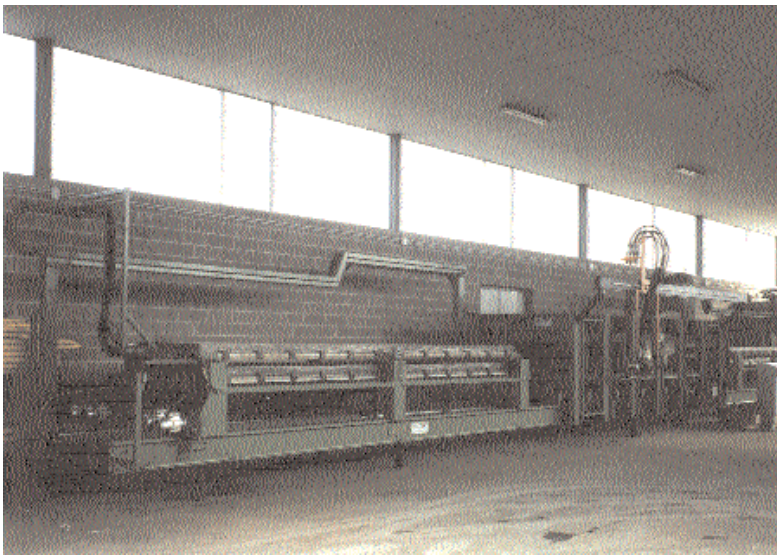
1.1 Manual mode injection technology at closed mould

This is the commonly utilised technology thank to its versatility.

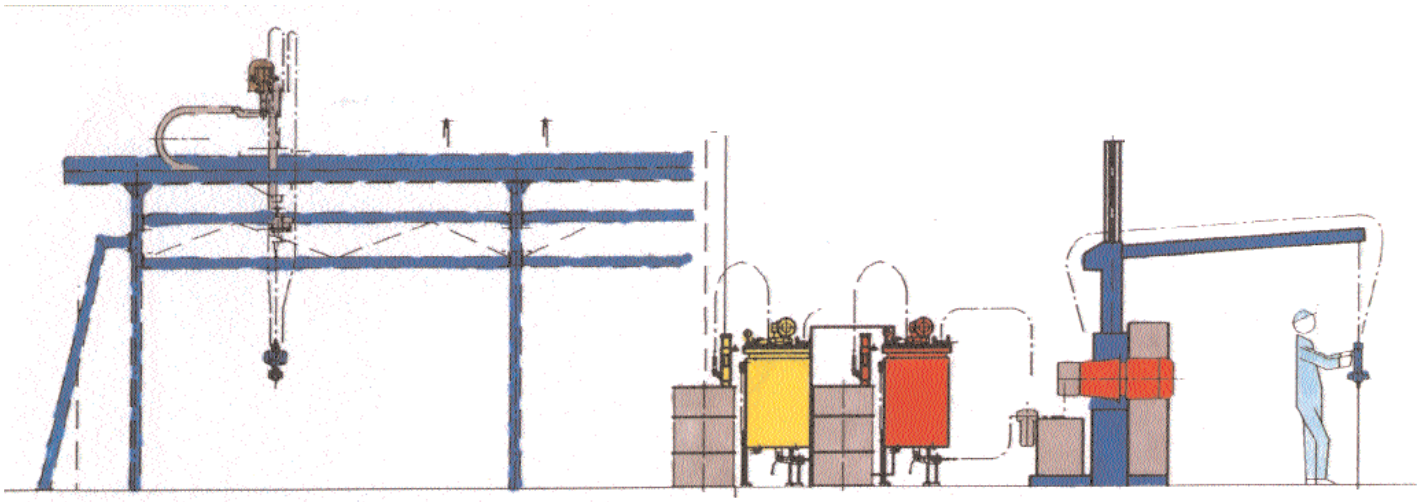
A standard plant composition is based on a low pressure metering machine and a single or multi-daylight press depending on the production requirements of the end-user.

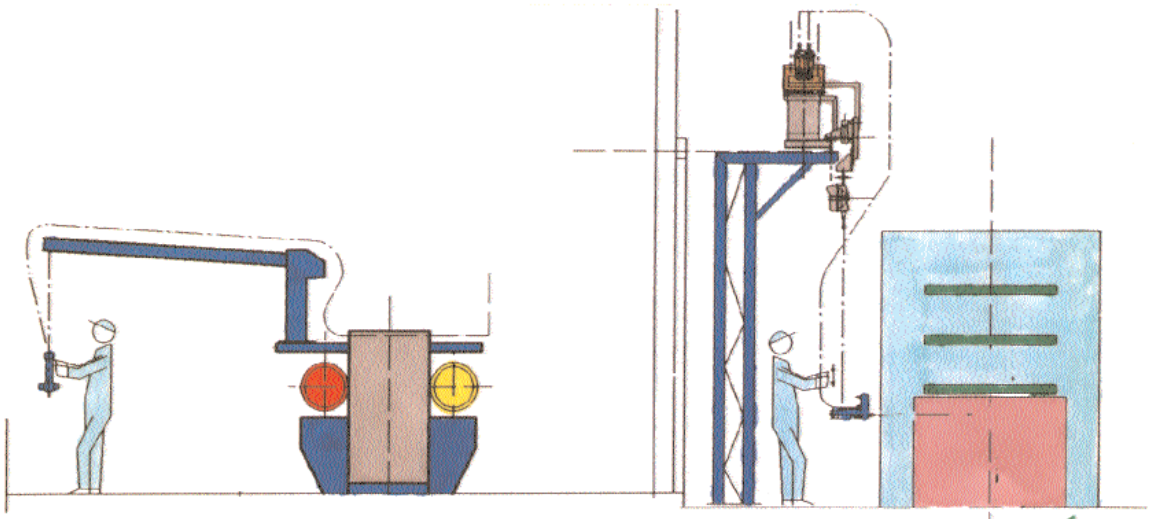
The production process includes the pre-assembly of the panel on the tray which will be then conveyed to the press for the foaming. Some wooden or metal side containments are placed all around the panel perimeter to contain the polyurethane foam expansion.

Along the longitudinal side of the panel containment there will be holes (their number depends on the panel dimensions to be produced) suitable for the mixing head to be inserted during the foaming.



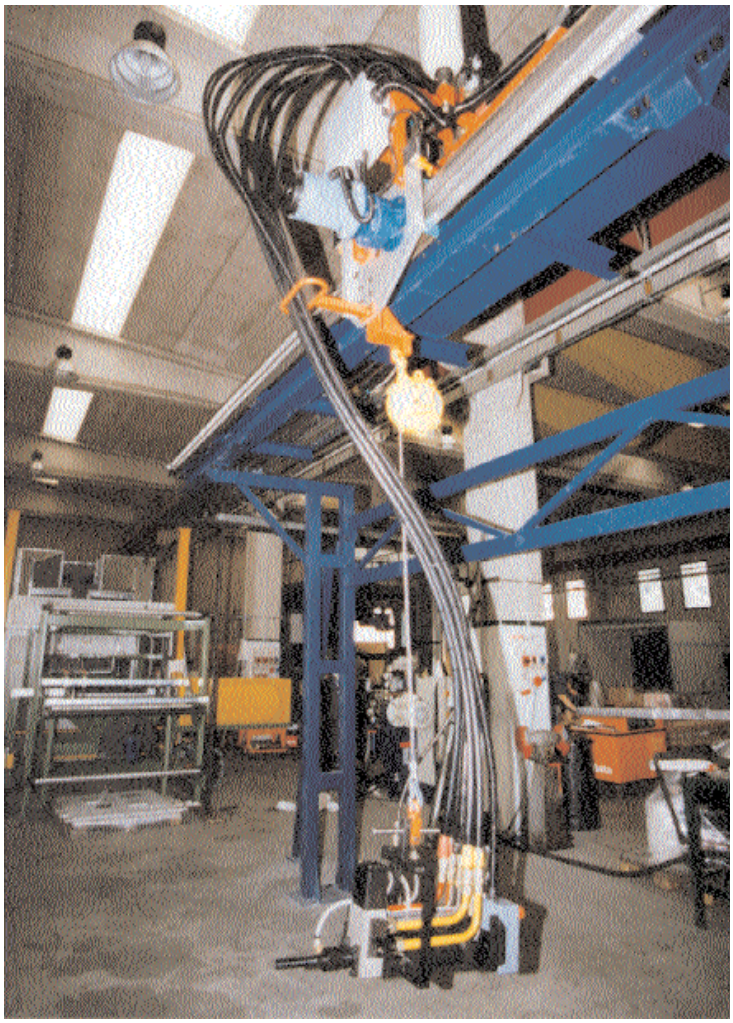
The mixing head movement is through either a manual or power-driven carrier for entering the injection holes. All panels foaming phases within the press will be manually carried out by the operator.

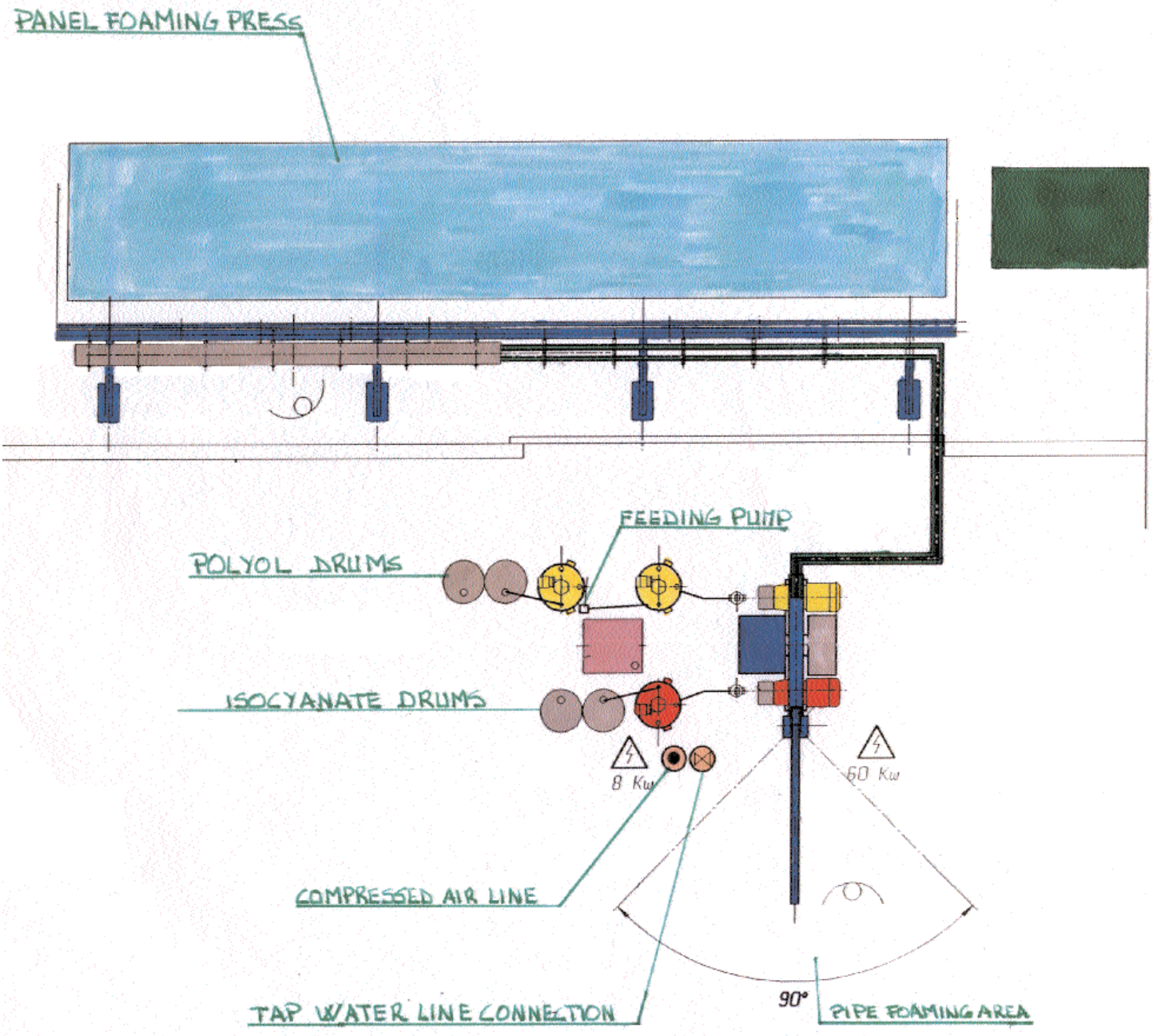




DRAWING 1.1A

OMS Group
Polyurethane Evolution





DRAWING 1.1A bis

OMS Group
Polyurethane Evolution

With a single foam injection it is possible to fill up evenly a panel of maximum 3x1m

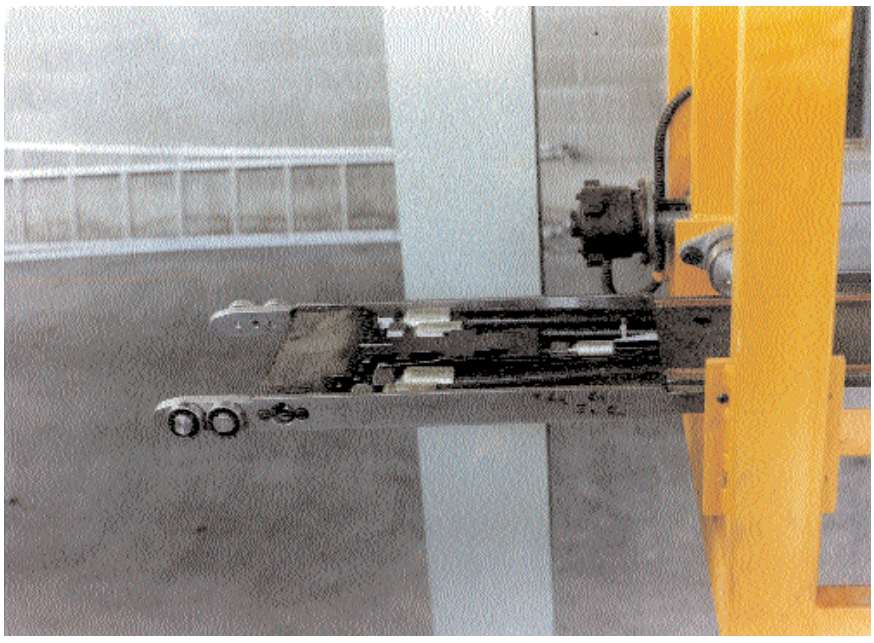
During the panel polimerization phase it is possible to pre-assemble a new panel on a further tray thus optimising the press productivity which depends on both the number of press plates and the polimerization time according to the panel thickness to be produced.

Hence, the press production cycle ranges from 20 to 45 minutes.

From a technical point of view, this process is simple and functional notwithstanding the loss of quality when panels of large dimensions are produced. Since the polyurethane foam is injected only in certain pre-arranged points, a smooth and even distribution of the foam is not ensured due to the huge volume to be covered during the expansion phase which may results in an inconsistent foam density over the area of the panel.

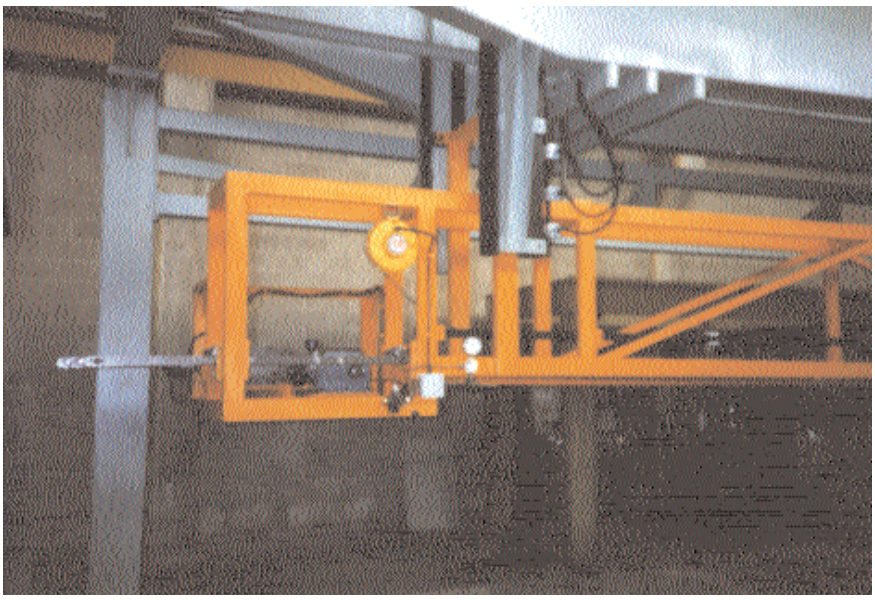
1.2 Automatic mode lance displacement at closed mould

This is an alternative solution to the previous illustrated technology and it ensure an optimal distribution of the polyurethane foam with a constant density.

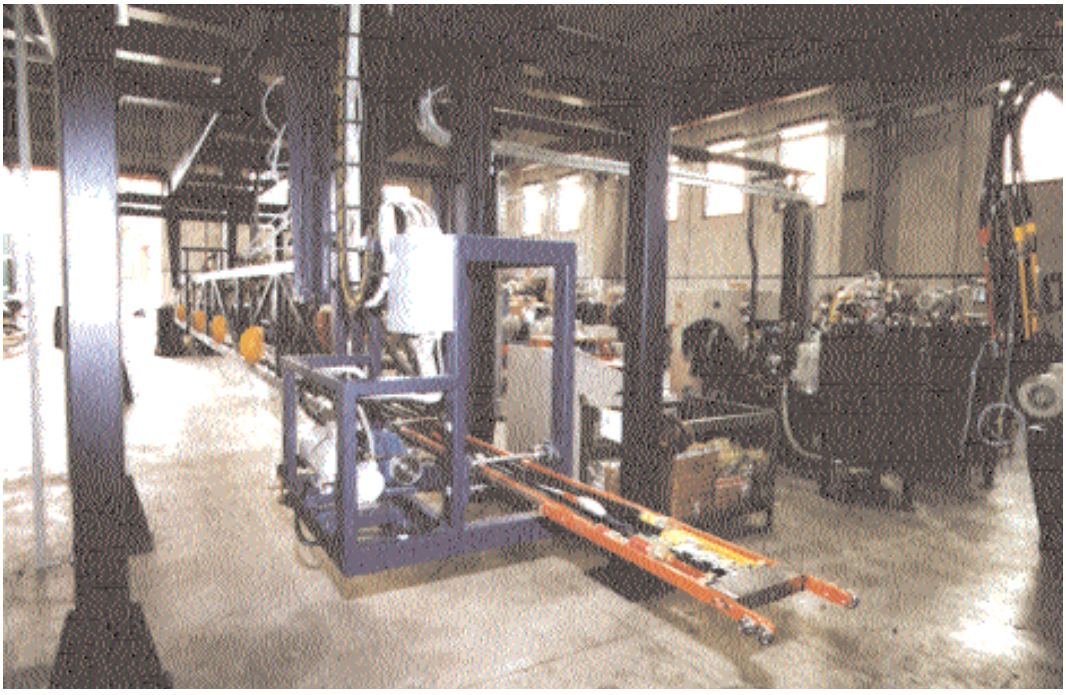


A standard plant composition is based on a high pressure metering machine with relative mixing head which, through an automatic movement system, is introduced inside the panel cavity to the furthest extremity of the panel, previously pre-assembled and conveyed into the press.

The foam distribution takes place during the mixing head retrieving phase/backward movement from the panel.



Due to the mixing head dimensions, it is not possible to produce panels having a thickness below 40mm, bearing in mind that this technology is applied only for the production of panels having a pre-determined length (from 8 up to 14m) with a maximum width of 1200mm.



By and large, this lance displacement system can be compared with the one adopted for the continuous panels production line since special formulations can be used offering the advantage of reducing the polimerization time with a consequent production cycle improvement.

1.3 Automatic mode injection technology at closed mould

This technology is mainly used for the production of panels for walk-in cold rooms and refrigerated containers where high thickness and large width are needed to ensure a smooth and even distribution of the polyurethane foam with a constant density.

Each refrigeration application fields has its own dedicated plant typology:

A. Walk-in cold room production plant

High pressure metering machine with relative mixing head and single plane oyster opening system press. The mixing head will be equipped with a power-driven carrier which, in automatic sequence, moves the head along the press during the polyurethane foam distribution within the panel.

A smooth and even distribution of the polyurethane foam along the whole panel length is ensured by a PVC pipe with suitably sized holes allowing the out-flow of the polyurethane. This pipe is positioned on the mixing head and supported by a suitable automatic system which releases the pipe either within or at the extremity of the panel once the injection is over.

Of course, before carrying out this process, the panel is pre-assembled on its tray and subsequently conveyed into the press; the upper press plane closes to retain the panel upper substrata through suitable suction cups and opens soon after to let the polyurethane distribution cycle start.

Once the distribution cycle is over, the press upper plane closes again to release the substrata in its original position and let the polimerization cycle start.

B. Refrigerated containers production plant

High pressure metering machine with 2 no mixing heads and relative press. Differently from the previous illustrated process, both mixing heads are fixed on to the short sides of the press (one head on the right and the other one on the left hand side) and interconnected through a PVC pipe with duly sized holes to allow a smooth and even distribution of the polyurethane foam during the simultaneous injection phase.

This pipe is supported by a suitable automatic system which releases the pipe either within or at the extremity of the panel once the injection is over.

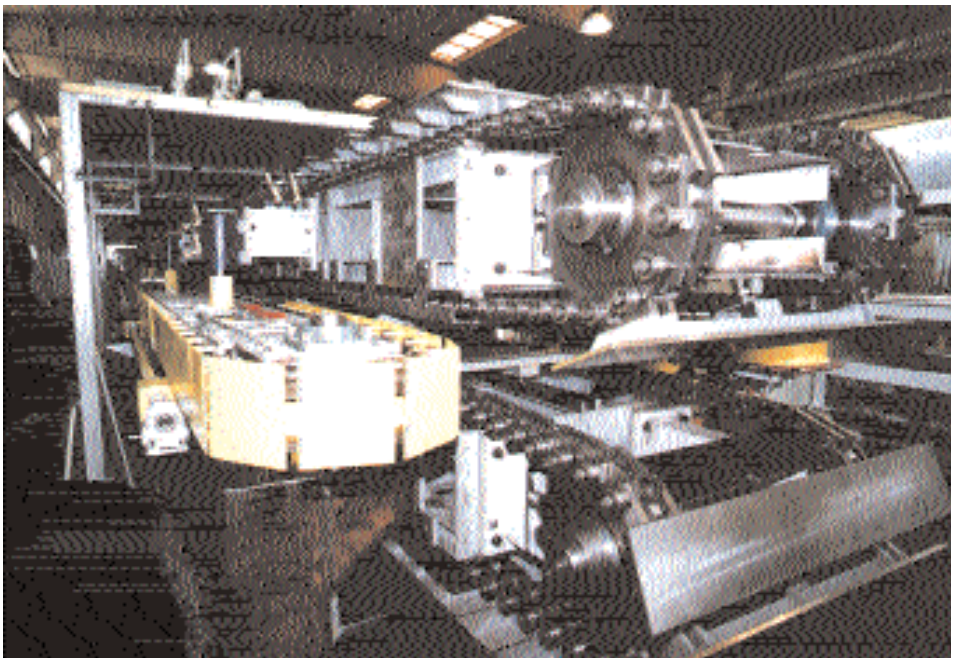
The production process for this particular type of panel is identical to that illustrated at point A), the main difference being the withdrawal of the lower tray and the injected of the panel during its re-entry into the press.

Conclusion

This is just a mere introduction to the possible applied technology for the production of discontinuous panel production plants.

OMS Group can fully satisfy any specific technical or production requirements and needs of any end-users by supplying specifically designed plants.

2. Continuous Process



The continuous panel production process is certainly the most convenient for quality and quantity standards achieved.

This technology is by and large for the large scale production of high quality panels with either rigid or flexible substrata.

A standard, conventional, fully integrated continuous panels production plant is composed of:

2.1 Uncoilers

2.2 Loading coil cars

2.3 Roll forming unit

2.4 Pre-heating oven

2.5 Metering machine

2.6 Reactive mixture distribution

2.7 Flexible face uncoilers

2.8 Double conveyor belt

2.9 Panel profile change-over system

2.10 Panels cutting unit

2.11 Panels unloading and stacking line

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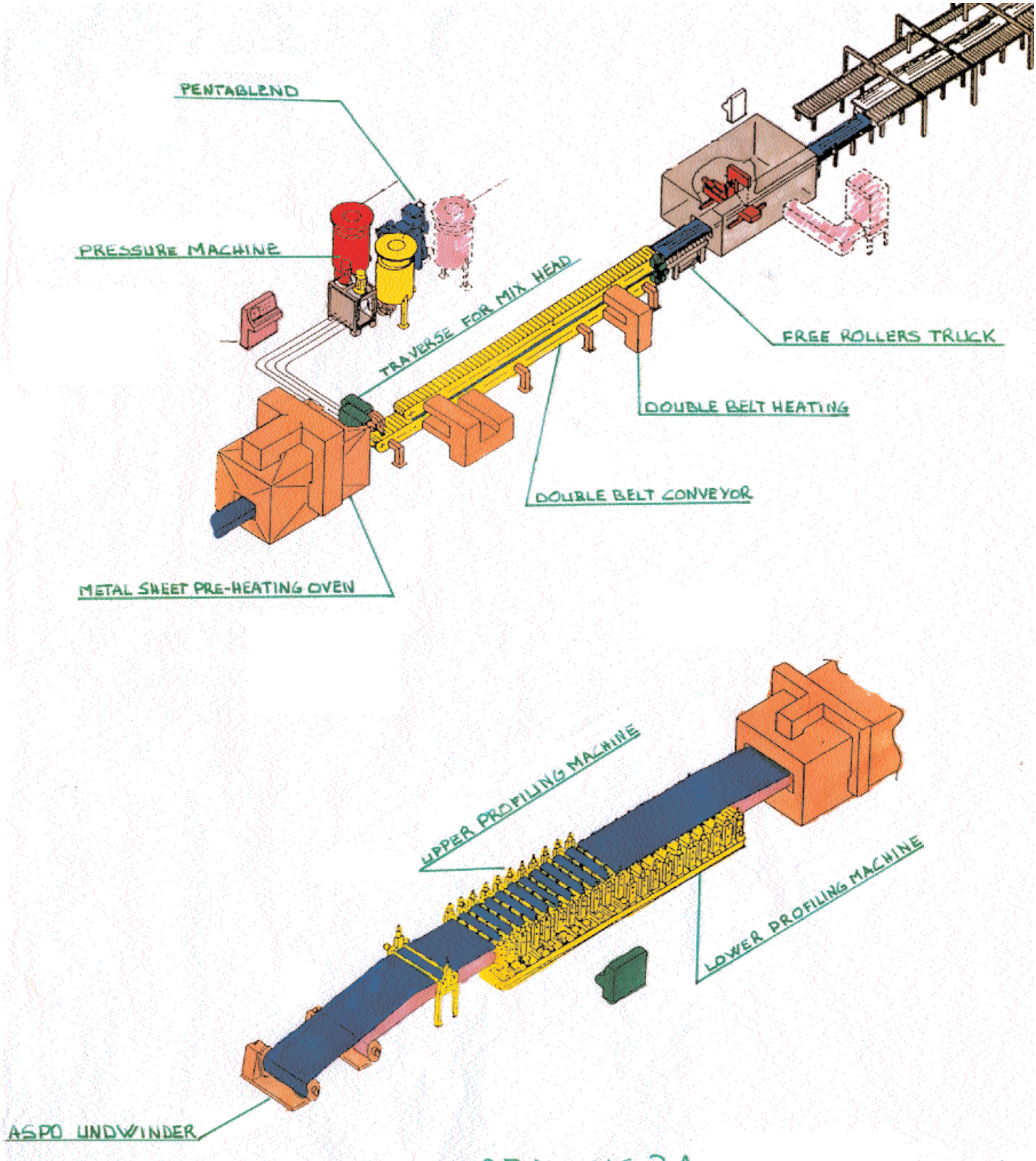


DRAWING 2.A

2.1 Uncoilers

Uncoilers support and guide the sheet layer coils towards the roll forming machine to be shaped.

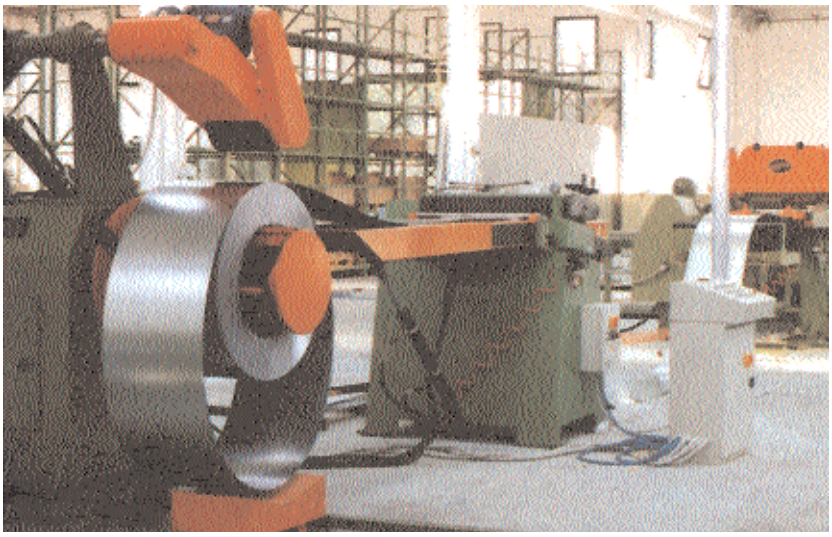
The uncoilers are two: one for the lower sheet layer and the other for the upper sheet layer.

2.2 Loading coil cars

Loading coil cars are used to position the sheet coils on the uncoilers.

The coils can be set on the uncoilers even by using a fork-lift only on low speed production plants. For more sophisticated plants loading coil cars are necessary.

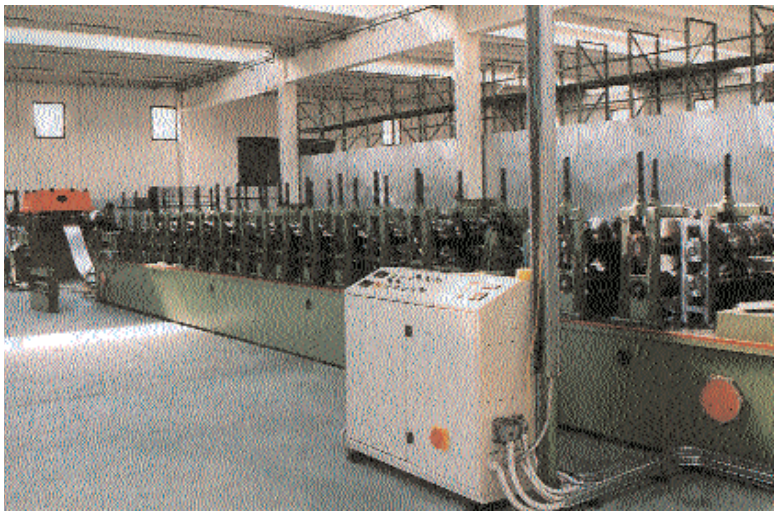
Coil cars in steel structural frame-work fitted on an hydraulically driven sliding support. A "V" shaped platform is moved upward and downward by a hydraulic cylinder for coil loading.



2.3 Roll forming unit

Choosing the right roll forming unit is dictated by both the types of panels to be produced and the financial investment on the plant.

The configuration of the roll forming unit relies on the type of panels to be produced: corrugation depth, design of the profile, max width of the panel and detail joint designed of the panel (male/female; secret fix joint; cold store joint).

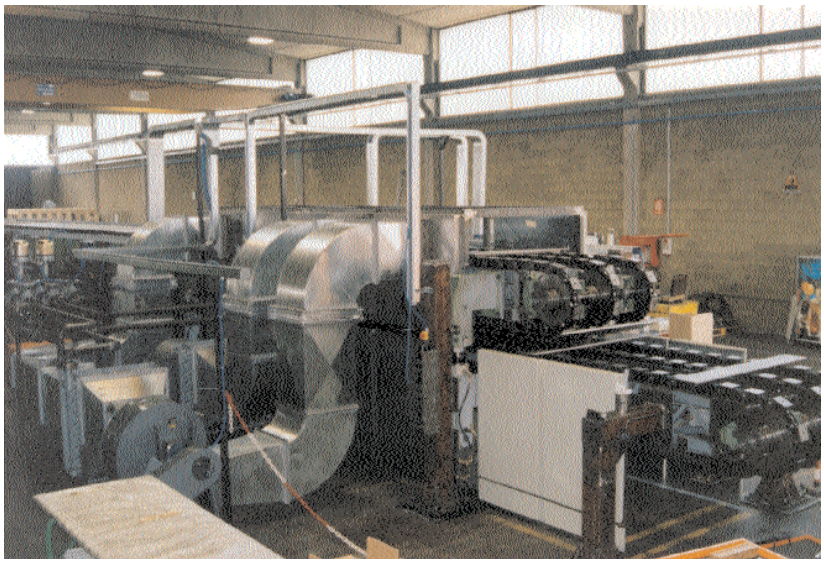


2.4 Pre-heating oven

This pre-heating oven heats the profiled metal sheets to the right temperature to ensure the even and smooth expansion of the polyurethane mixture.

The temperature control of the metal sheets is extremely important to ensure a high quality foamed panel. An unsuitable sheet temperature may cause a different foam density distribution and lack of adherence between polyurethane and metal sheets.

A hot-air circulation oven is the best to be used.



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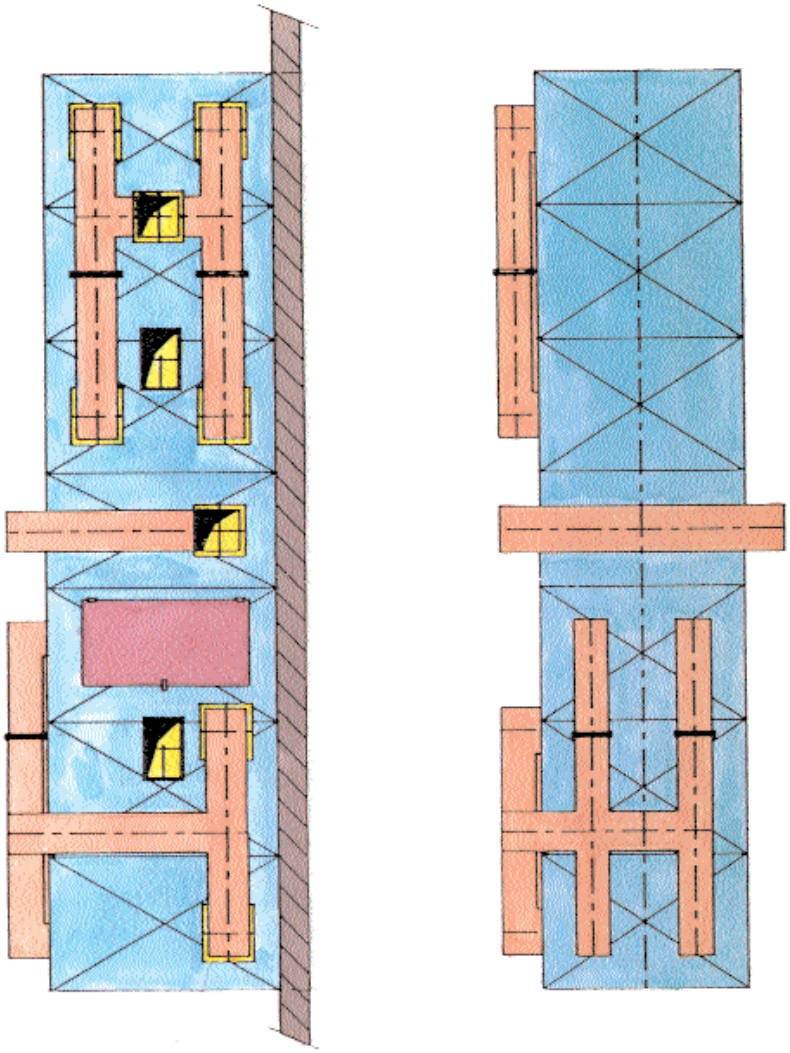
PRE-HEATING OVEN

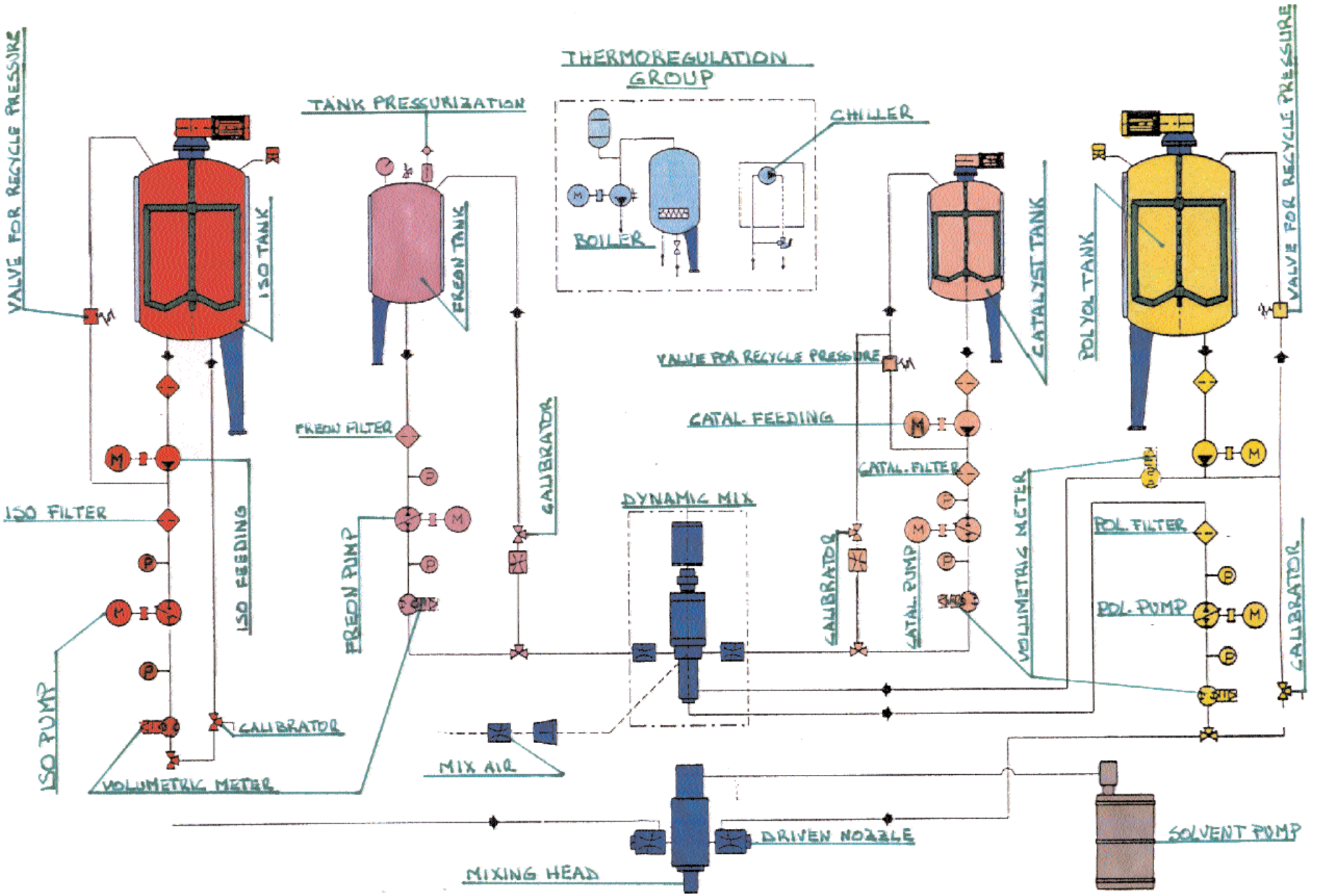


DRAWING 2.4A

2.5 Metering machine

The main benefits offered by a high pressure metering machine compared with a low pressure one are:

- Better mixing of the components;
- Compact dimension of the mixing head resulting thus in:
- Positioning in restricted spaces;
- Solvent-free cleaning at end-of-production;
- High efficient monitoring of all working parameters;
- Possibility to use, according to the present regulation in force, blowing agents alternative to Freon 11 thanks to dedicated instruments;
- Environmental friendly solution

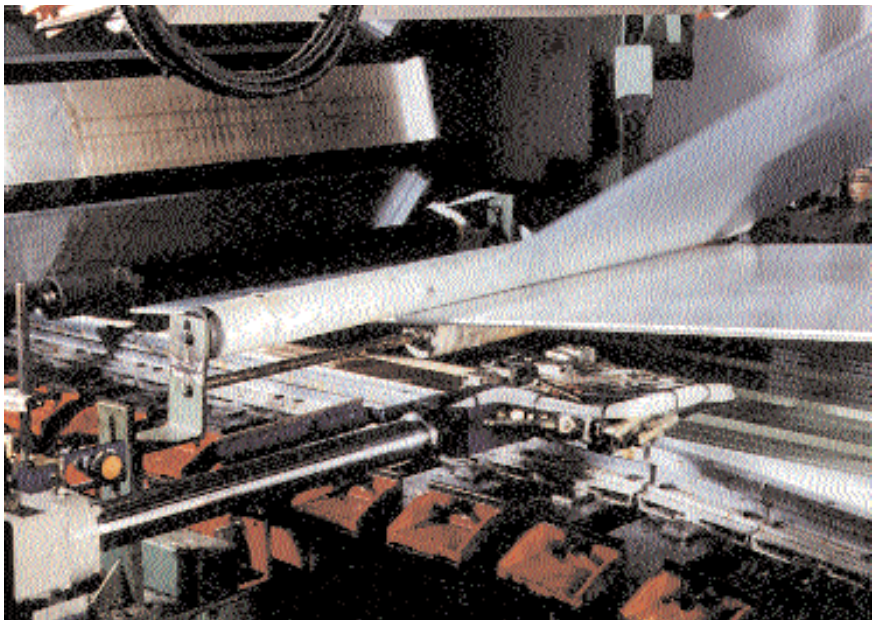


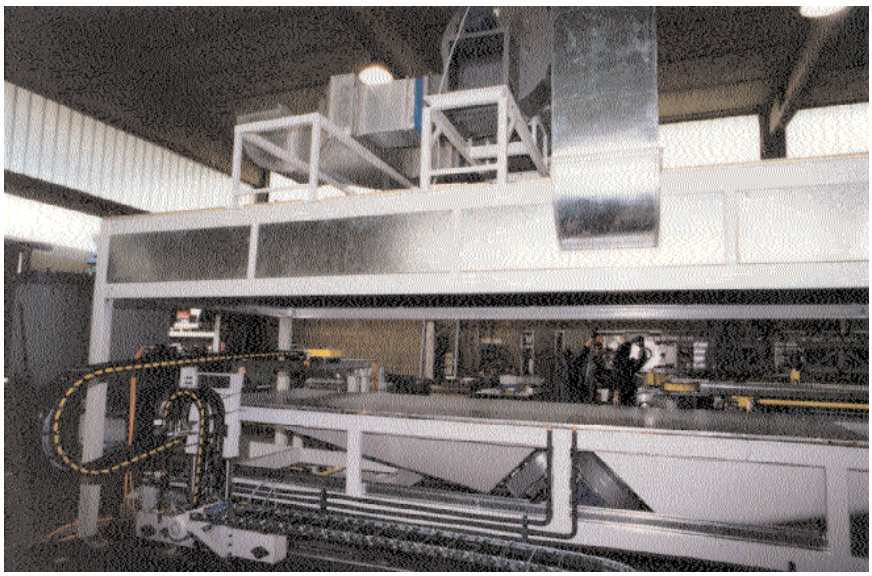
FLOW CHART 2.5B

2.6 Reactive mixture distribution

A traverse provides a backward/forward movement to the mixing head thus enabling a smooth and even distribution of the reactive mixture all over the lower substrata thanks to a wider range of nozzles thus avoiding splashes, air bubbles and foam superimposing during the rise phase.

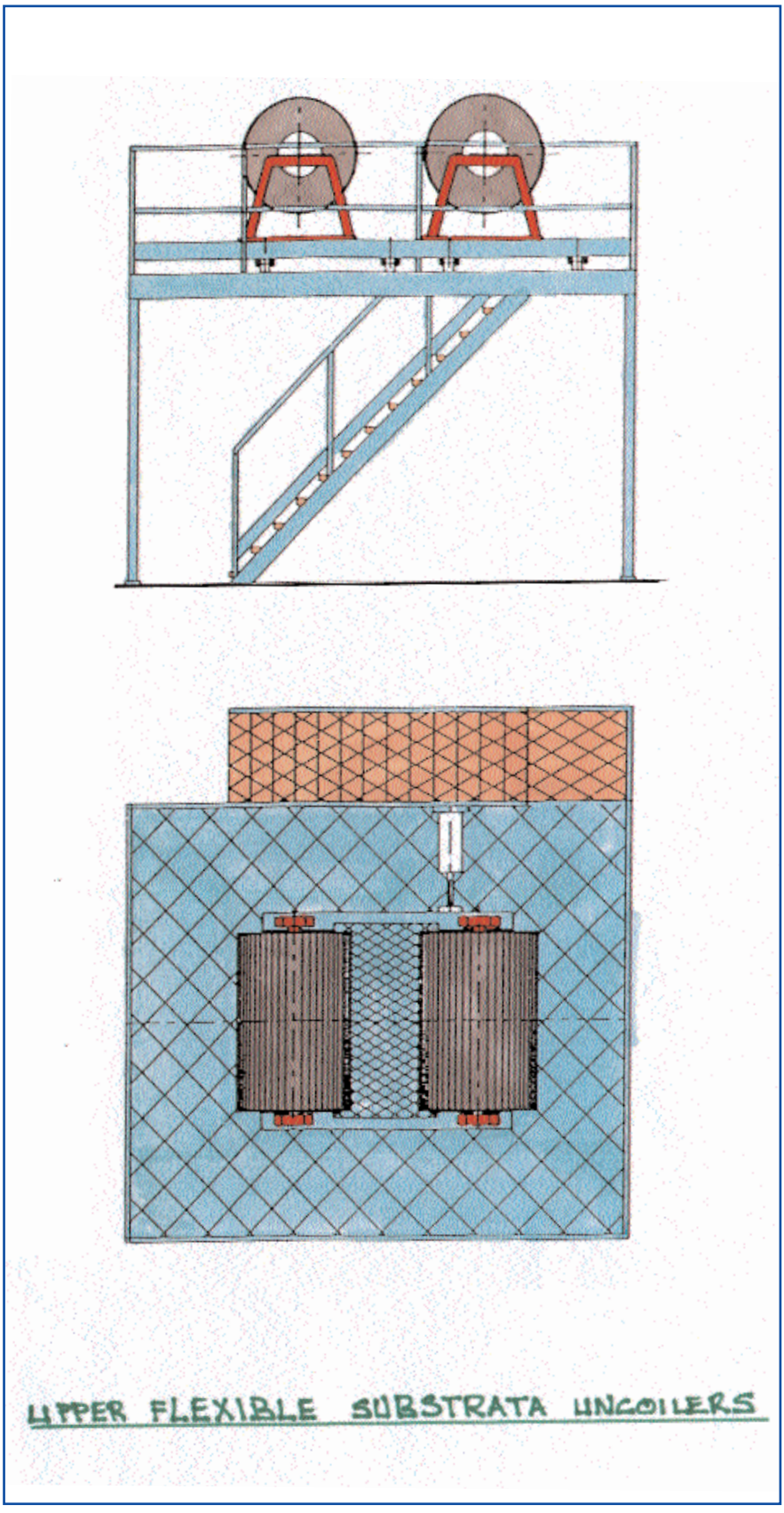
The robust structural support framework permits high reversion and translation speed of the mixing head according to the several production needs.





2.7 Flexible face uncoilers

Depending on the manufacturing flexibility of the plant which can alternatively produce metal faced panels, metal/flexible face, or paper/paper, the plant can be equipped with uncoilers for flexible sheets both on the lower and upper layer.



2.8 Double conveyor belt

The double conveyor belt contains the foam rise during the expansion and subsequent curing phase. Besides forming the press planes, both metal slats are inter-connected in order to have a high load bearing chain complete with side rolling-bearings.

The time the panel stays on the conveyor depends on both raw materials used and pre-set panel thickness: for a 40mm panel thickness it takes around 2 - 3 minutes.

OMS Group has built conveyor belts ranging from a minimum of 15m up to a maximum of 38m total length. The standard width is 1200mm, the distance between the two conveyors planes ranges from 20mm up to 400mm.

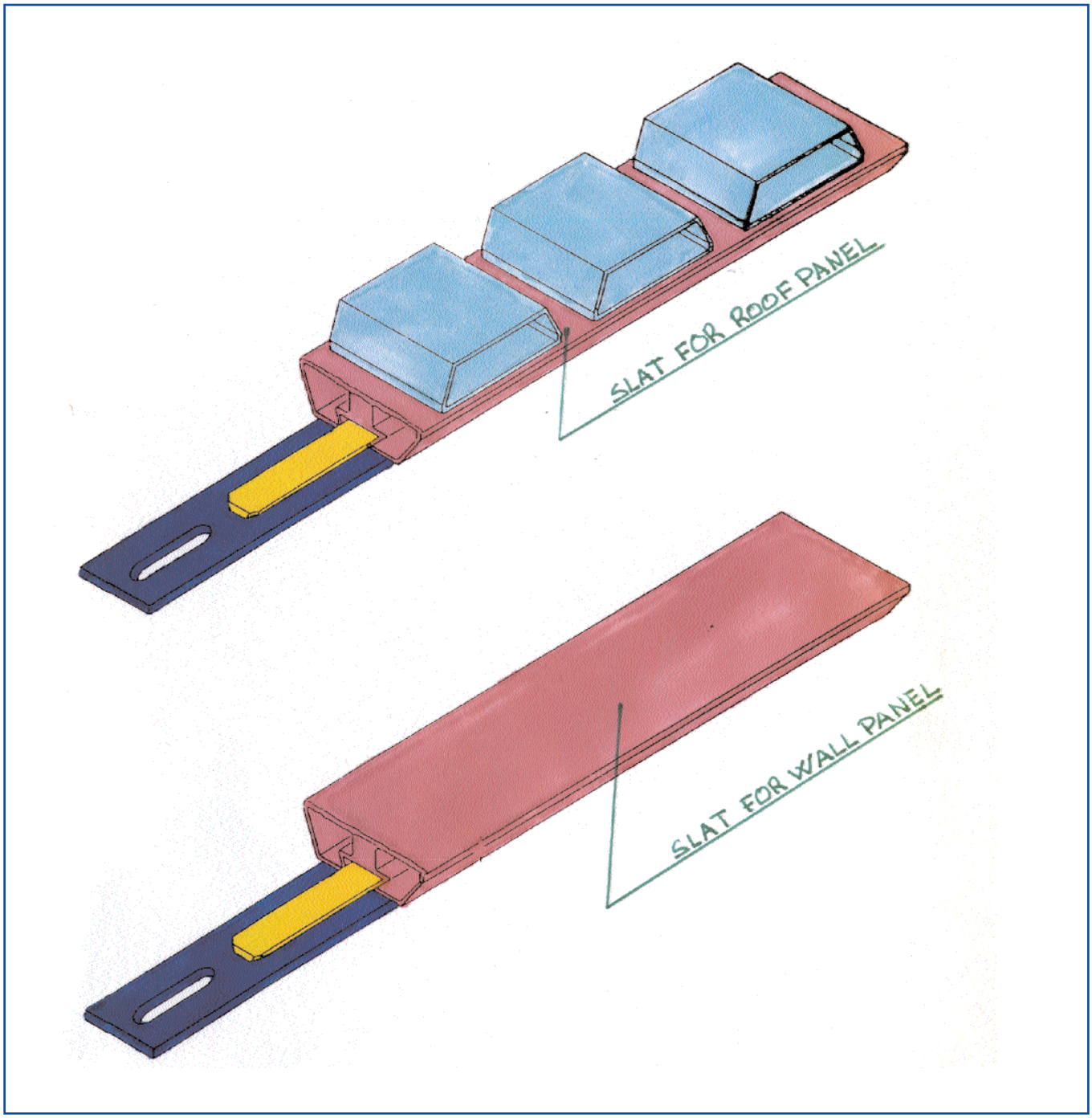
The variation in thickness of the panel to be produced requires the insertion of calibrated spacer rings at open conveyors. The upper conveyor is movable by a series of hydraulic cylinders, while the lower one is fixed.

The two conveyors are driven by two independent c.c. motors fitted with dynamic speed reaction, each one complete with relative motor reducers in order to ensure a perfect speed synchronization between the two conveyors.

OMS Group
Polyurethane Evolution

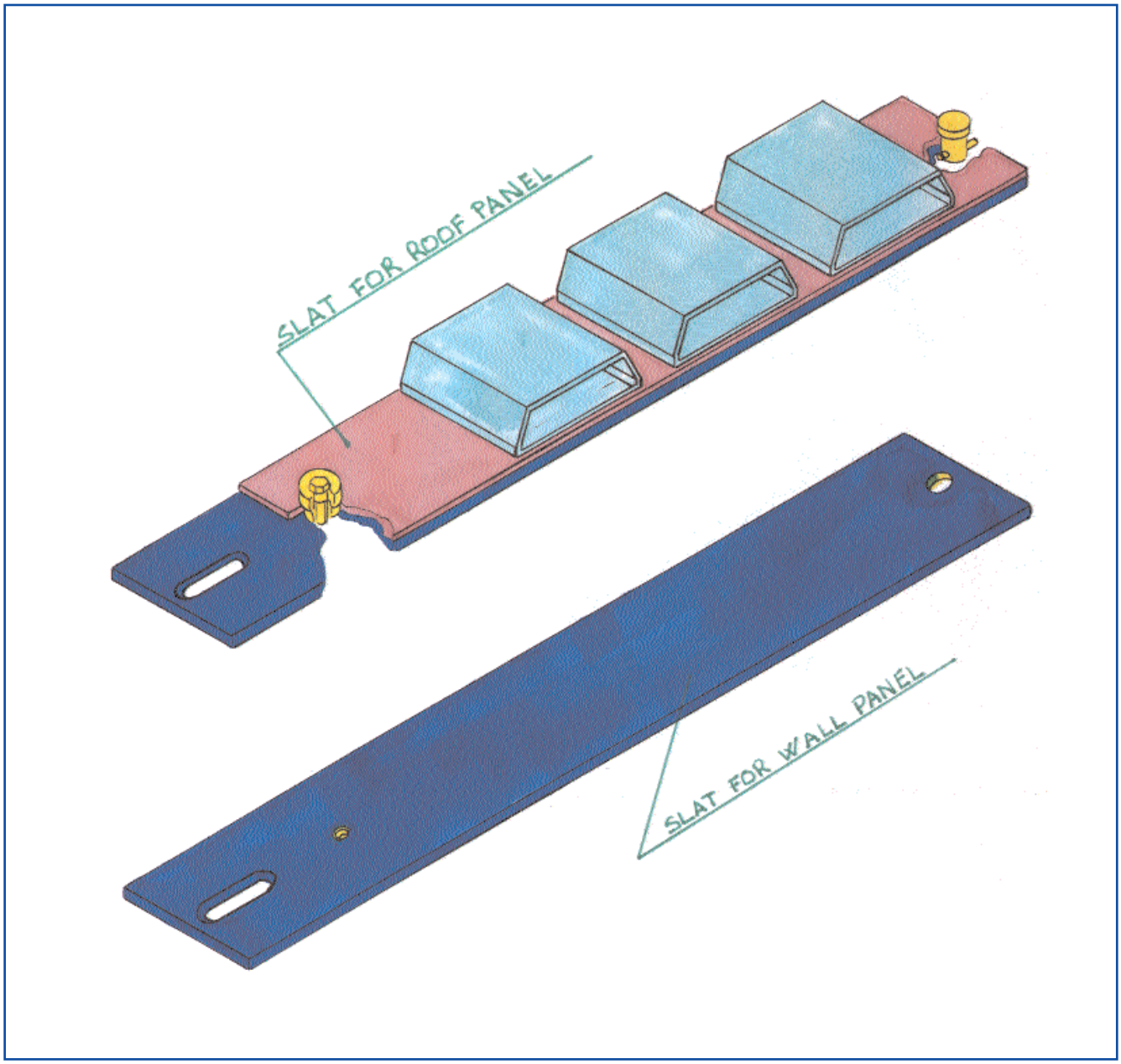
2.9 Panel profile change-over system

OMS Group has paid particular attention to the study of different possible solutions to minimize the change-over time by adopting simpler, functional systems.



Metallic slats have special guides which allow the insertion of accurately machined aluminium slats having a different profile according to type of panel (roof - wall) to be produced. For the side containment, these aluminium slats have holes to fix the aluminium inserts in to.

It should be noted that a complete change of the panels profile may involve a loss of time ranging from 60 to 90 minutes depending on the length of the double conveyor belt.



2.10 Panels cutting unit

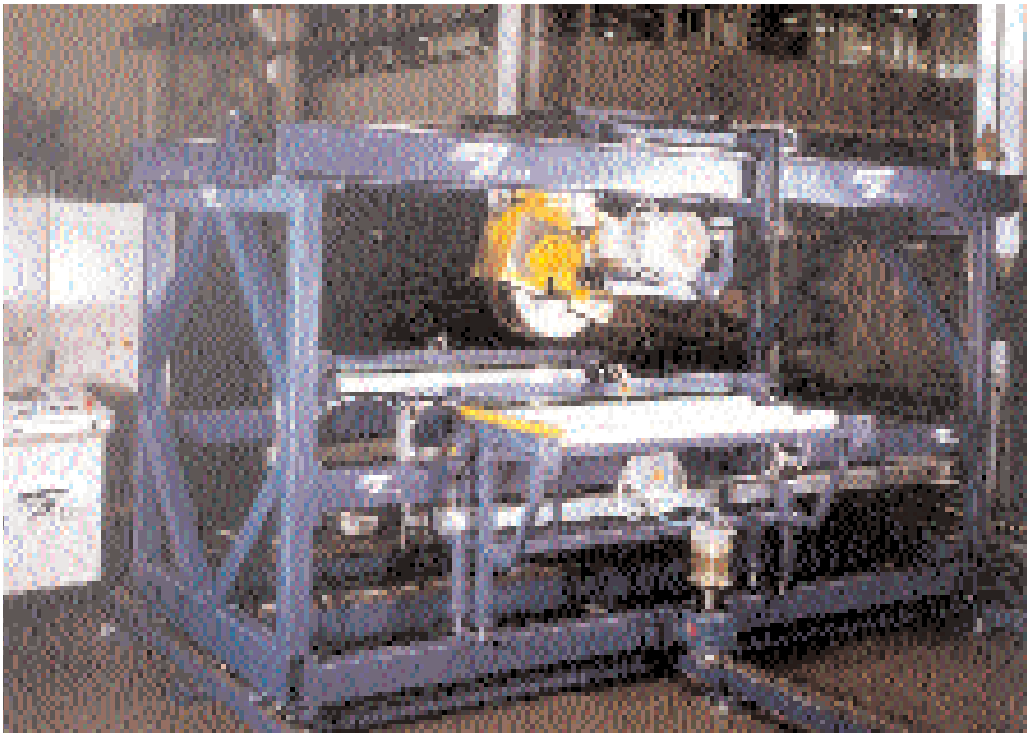
Before reaching the cutting unit, a free-turning roller conveyor houses the PU panels for enough time (few seconds) to achieve a foam stabilization; only afterward it is possible to cut the panels to the desired length.

It is possible to pre-set both the desired cutting length and number of panels to be produced; once the pre-set panels number is reached, an electric timer fixes automatically a new pre-set length and relative number of cuts to be effected.

The cutting units dedicated to flexible substrata have completely different mechanical features from the ones used for cutting metal faced panels.

These units can be either:

- **Circular disk cutting machine;**
- **Band-saw cutting machine**



2.11 Panels unloading and stacking line

A standard continuous panel production plant ends with an unloading and stacking line storing all panels according to their length.

The investment this equipment requires may vary according to the type of systems adopted: manual, very economical; semi-automatic, average investment, and completely automatic system which is quite expensive.

The panels unloading system depends on both plant productivity yield and width of the panels to be produced.

OMS Group proposes two different systems:

- **Rollers system;**
- **Rotary cage system**

Conclusion

Besides manufacturing conventional panel production plants as the ones just illustrated, **OMS Group** can fully satisfy any specific technical or production requirements and needs of any end- users.

This information is for guidance only to all those companies wishing to be introduced to the panels continuous and discontinuous technology.

Pentane
BLOWING AGENT:

Main characteristic of a standard polyurethane production plant using pentane as alternative blowing agent

Pentane has replaced Chlorofluorocarbons (CFC) once used as blowing agents in the production of several different kinds of polyurethane foams.

The hazard in using Pentane lies in its highly flammability at room temperature since a high concentration of pentane vapours in the air can make the atmosphere explosive.

Indeed, percentage volume of pentane vapours in the air ranging between 1.4% (Lower Explosion Limit) and 8.1% (Upper Explosion Limit), in the presence of any source of ignition (sparks, flames and high temperature) may generate an explosion.

Consequently, all machinery and plants using a potentially explosive gas must be manufactured adopting suitable technical measures aimed to:

- **Minimize the hazard of explosive mixture**
- **Eliminate all possible dangerous conditions**

The technical measures mainly involves:

1 - Electric Circuitry under Special Safety Execution

In compliance with regulations presently in force, all electric circuitry dedicated to and located in hazardous areas must conform to particular technical specifications.

According to I.E.C. 79-10 International Standards, all hazardous plant areas are classified considering the quantity of dangerous substances, the working process and the ambient temperatures; volumes of the hazard areas are pre-calculated.

The electric circuitry typology, and eventually the dimensioning of the ventilation system aimed to reduce the volume of dangerous areas, is determined taking into consideration the above data.
All electric elements present in a hazardous area must be executed under Eex safety execution.

2 - Manufacturing Safety Precautions

To minimize sources of ignition, some safety measures are implemented in the manufacturing of machinery and plants:

- Earth bonding system of all metal elements composing the plant;
- Utilization of non-electro static devices/elements;
- Equi-potential connection between both ends of the pipes;
- Ventilation system to reduce the alarm threshold level in the dangerous areas;
- Pentane gas detection system through sensors;
- Utilization of perimeter guarding to delimit the dangerous areas, i.e. enclosures, walls, etc;
- Nitrogen blanket/inertization system of the storage and/or polyol/pentane tanks;
- Lightning protection system for storage tanks.

Safety measures applied to a standard polyurethane production plant using pentane as alternative blowing agent

OMS Group's safety concepts on machinery and plants using pentane incorporates the following measures:

- Pentane leakage detection system with acoustic and visual alarms located in critical points within the plant;
- The alarms signalling system has two intervention warning levels:

  Level 1: acoustic and visual warning and relative button to stop either machine or plant;

  Level 2: acoustic warning and power cut-off to either machine or plant involved;
- Emergency buttons to block/stop the production line in case of pentane gas leakage;
- Increase of air-flow capacity of the ventilation system in case of pentane gas leakage;
- Monitoring system integrated in to the ventilation system;
- Power cut-off to all electric circuitries present in the alarm alerted area;
- Constant monitoring of all main leakage sources;
- Fail safe valve fitted in correspondence of all pentane feeding pipe inlets;
- Fire extinguishing systems (optional).
- Back-up generator to feed either the ventilation system and the gas detectors (optional).

CONCLUSION

A production plant using pentane requires both specific construction and manufacturing design and production process technology. In this aspect, particular attention is paid to personnel safety against injuries, safe operation of machinery and environmental issues.

HIGH SPEED LAMINATOR FOR FIRESTONE U.S.A.

Firestone Building Product, Carmel Indiana, USA, one of the leading manufacturer in the insulation boards and assembly materials for the construction industry, has chosen OMS Group as partner supplier for a new continuous production plant of flexible faced PIR rigid foam insulation panels.

The most modern continuous plant in the world has been delivered and installed by **OMS Group** in the brand new Firestone's factory building based in Deforest, Wisconsin.

Launched in July 2000, this plant can produce panels at a speed of 60 m/min (i.e. 72 m2/min, since the real panel width is 1.2m).

This technically advanced plant is composed of:

* Double belt conveyor, 30m total length, working at 60m/min (real production speed)
* Thickness of the panels produced: ranging from 10 to 220mm
* Possibility to produce tapered panels (max inclination 60 mm)
* Automatic adjustment of panels thickness; simultaneous adjustment thanks to the innovative constructive concept applied to the double belt conveyor.
* Heating system for the double belt conveyor at a temperature of +80°C in order to process PIR foams even though highly reactive
* Tunnel covering the entire length of the double belt conveyor made in self-supporting insulated panels able to contain eventual heat dispersion
* Metering and mixing unit for Polyol + Pentane, composed of three high pressure metering groups, each one equipped with "mass" type flow meters
  This unit is also able to work even with alternative blowing agents available on the market
* Closed-loop control system for all working parameters; metering pumps output; temperature; working pressure; production speed; etc,)
* Plant control is completely integrated into an Industrial PC (personal computer) to handle and control the whole production line
* Safety and ventilation/extraction system to monitor -through adequate sensors and relative suction groups) all the working areas for safe use of flammable blowing agents (Cyclo-pentane, Normal-pentane, Iso-pentane, etc)

Thanks to the fruitful co-operation and in-depth experience of Firestone's personnel in the running of continuous panels production lines, the start-up of this brand new plant was made in a record time: just one week from the assembly of the production line.

Thanks to Firestone