

SLABSTOCK FOAMING MACHINE TYPE FP-200-FT FOR CONTINUOUS PRODUCTION OF FLEXIBLE FOAM

Millions of people all over the world enjoy high quality furniture and bedding comfort from Polyurethane Foam produced on HYMA Foaming Machines.

More than one hundred complete foam factories and thousands of conversions machines are in operation in more than ninety countries.

The type FP machines have been thoroughly tested and operated in foam factories since 1968.

USE OF FLEXIBLE FOAM

Approximately 80% of the polyurethane foam produced in the world are used for bedding and furniture fabrications, as the sole material or together with other foam products, and traditional furnishing material.

The successful property of foam for the bedding and furniture markets are the flexibility, durability and controllable resilience in supporting the human body. Other markets for foam include clothing components, insulation and packaging products.

In many third world countries, where foam is still considered a luxury product due to the high price of the chemicals used in the process, very often mattresses in density 15kg/m³ and lower are used. This result is dissatisfaction from the customer's as such low-density mattress collapse after only a short time.

In Europe it is a standard requirement to use foam with density higher than 23kg/m² for mattresses and sometimes combined with different types foam with specific properties such as higher resilience, a high quality bedding product can be produced.

For many years the foaming have utilised the HYMA Slabstock Foaming Machine type FP-2 and FP-5 low

pressure foaming machines, easy to operate and for years have been able to produce foam of good quality. The foaming process, however is the conventional type slabstock. With the expansion of the foam from the levelled slab conveyor and upwards creating domed top blocks.

If the blocks are intended used for peeling the waste level is reduced, but otherwise the domed top will result in a lower yield of the foam material to be used for regular mattresses or sheet production. Waste percentage can be reduced by using the top, side and bottom skins as filling in cushions after granulation.

FLAT-TOP FOAMING FOR REDUCED WASTE

HYMA has recently introduced the FP-200-FT Flat-top foaming machine based upon the foam creaming in a trough and by means of adjustable fall-plate systems to let the foaming expansion take place approximately 70 percent downwards from the horizontal line and only approximately 30 percent upwards. With the use of well-proven formulations correct mixing of the chemicals and balanced speed of the horizontal slabstock conveyor system, an almost square block foam can be produced. The waste percentages can be reduced considerable. Therefore on a relative short time can give satisfactory payback on the capital invested.

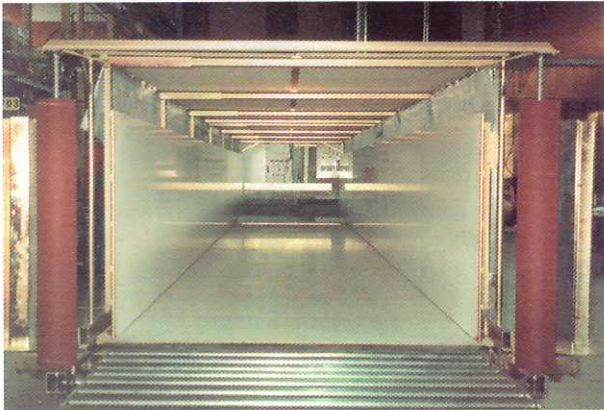
The new foaming machines will result in more rational production in the industry. The control unit is of a latest design, developed specifically for industrial applications and is much more reliable, easier to operate and to service.



A COMPLETE SERVICE FOR THE FOAM INDUSTRY



HYMA Foam Machinery



Module built Foaming Machine Type FP-200-FT for Flat-top production of PU Polyether Foams.

The mixhead can be flushed by MCL for cleaning after foaming, by mean of air.

The mixhead is sturdily mounted above the fall plate section of the Machine. The mixer seal chamber is oil pressured to prevent transgression of chemicals to the seal. Variable Speed Drive to the mixing head can be provided as an optional extra.

TROUGH AND FALL-PLATE SYSTEM

From the mixer the chemicals pass via a trough to the paper-covered Fall-plate and the design enables the plant to foam blocks of high and flat topped quality. The trough is equipped with a lip conveying the reacting foam to the base paper. The fall-plate system consists of interconnected plates made of galvanised steel. Each fall-plate has independent height adjustment. The setting heights of each plate are indicated on a metering board next to the trough. Both the Trough and the fall-plate are height adjustable to accommodate different formulations of foam.

FOAMING TUNNEL

The tunnel construction forms a complete enclosure around the foam slab with top cover plates and sidewalls. The floor is a horizontal belt type conveyor supported by full width melamine boards.

Powering the conveyor will be a gear reduction motor with a variable speed controller with push button control and digital tachometer indicating metres per minute.

The sidewalls provided are constructed from melamine boards for rigidity.

Each section is adjustable to ensure correct alignment of the sidewall. The sidewalls are carried on brackets for easy manual adjustment of foaming width.

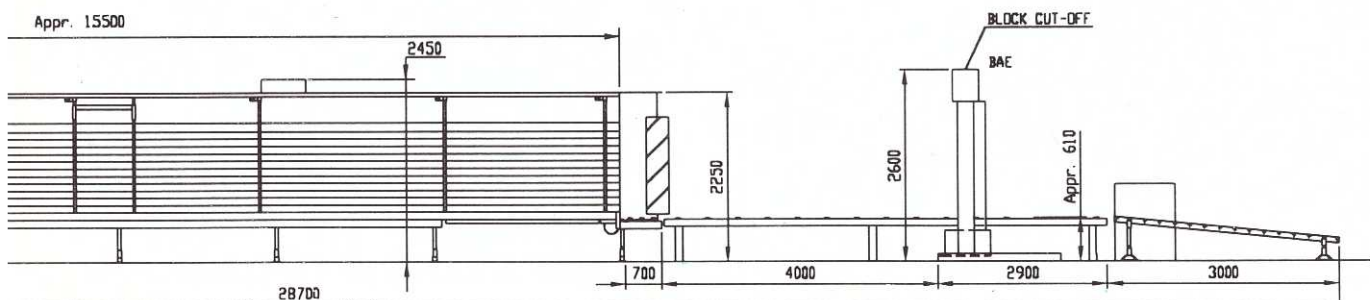
The tunnel roof covers the full width of the conveyor. Flexible curtains are fitted to allow access to the foam and to ensure ventilation of the tunnel. At the end of the tunnel there is a roller conveyor to transfer the foam block to the block cut-off machine.

For Ventilation of the tunnel 2 axial ventilation's fans are built in the roof. The ducting from these fans must be provided by the customer and fitted on the site. Ventilation above the Block Cut-off machine is recommended. An Infra-Red Heater unit for reduction of curing time for the block surface can be supplied as an optional extra.

PAPER SYSTEM

This is a 3-paper system. The bottom paper feed reel is mounted in front of the foaming platform and is equipped with alignment and tension adjustment. A paper cutting unit to trim the with of bottom paper is an optional extra. The side paper feed reels are mounted at either side of the tunnel mouth and are equipped with tension adjustment. Rewinding of the side papers is carried out at the end of the tunnel around a pair of capstan rollers and the rewinding speed is self-adjustable to synchronise with the foaming speed.

On the left, Foam blocks from Flat-top machine; on right domed blocks from conventional machine.



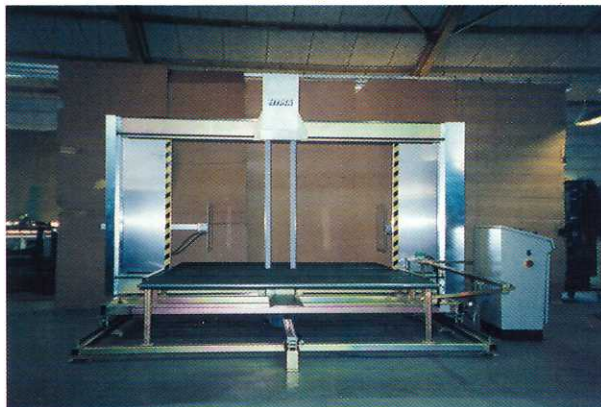
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CHEMICALS

The FP Machines can utilise all normal good quality chemicals available for the foaming industry. The temperature of the chemical fed to the metering system needs to have a constant temperature of around 21 Centi Degrees and it is advisable in case of high average temperature to store the chemicals for foaming in a temperature controlled area. The metering end of the foaming machine should be in a chilled area. This will avoid any uncontrollable reactions in the chemical process.



HYMA Type BAE Block Cut-off Machine.

with a transport conveyor fully synchronised to the speed of the foaming machine.

The HYMA range of cut-off machines are available for all makes of foaming machines.

HYMA offers a Complete Service for the Foam Industry.

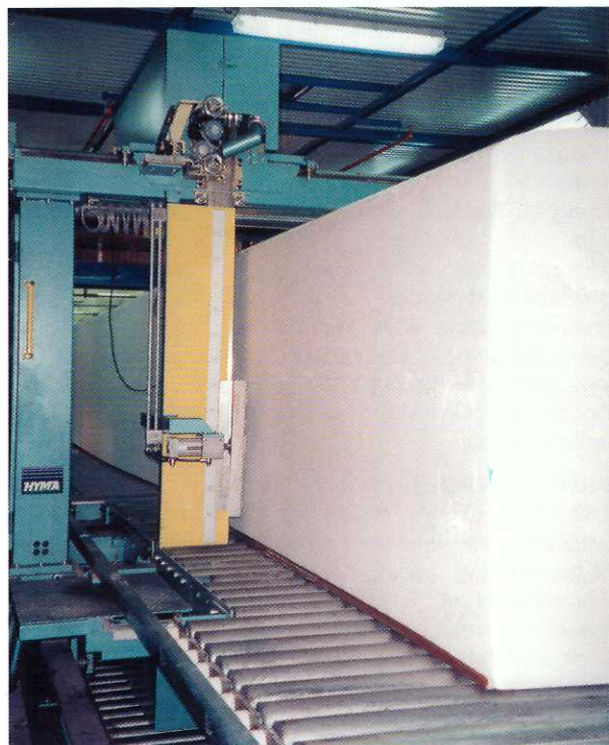
The HYMA range of machines for the foam industries include:

Horizontal Slitting Machines

Vertical Cutting Machines

Contour Cutting Machines

Rebonding Machined, Granulators and Silo systems



HYMA Type BAD Cut-off Machine suitable for all makes of foaming machines.

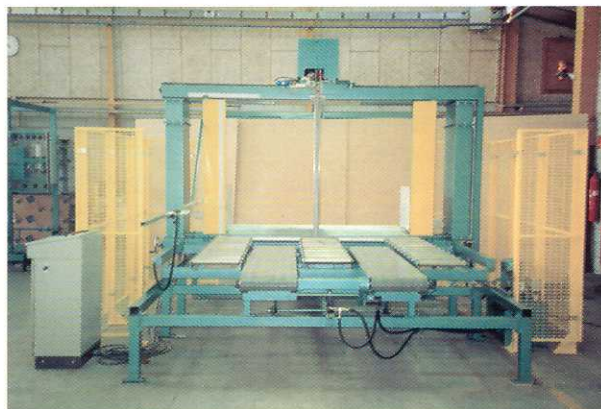
HYMA BLOCK CUT-OFF MACHINES

A FP-200-FT Flat-top Machine equipped with a well engineered and accurate block cut-off machine like the patented HYMA type BAD machine will reduce waste to a minimum and optimise profitability.

Type BAE economy transverse block cutter is the normal choice for FP-200-FT foaming machine. Cutting width of 160 - 200 cm, cut-of length of 100 - 300 cm with a tolerance +/- 10 mm. It is available with adjustable cutting speed and acceleration conveyor.

Type BAD transverse Cut-off Machine will cut blocks to length 300 cm with a tolerance of +/- 10 mm and with a smooth straight surface which thereby save any further trimming. The BAD type machine has already been in Service for many years and has proven a very reliable and precise block cutter of slabstock foams.

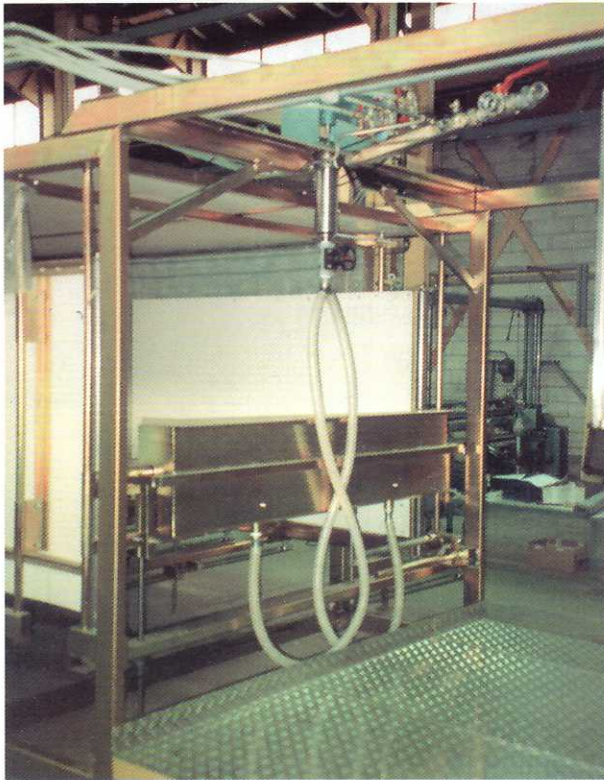
To be able to further cut down on the waste level and to improve the cutting tolerance to +/- 2 mm HYMA offer the superior type BA-DA. The cutting principle is an improved version of the type BAD machine, but with an advanced computerised servo control for positioning the cutting blade in relation to the direct measured block length and



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FP-200-FT FOAMING MACHINE

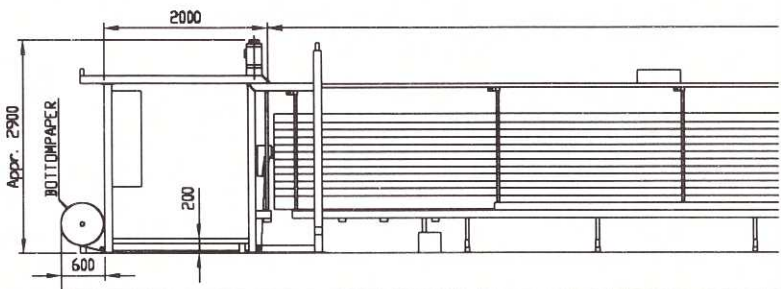
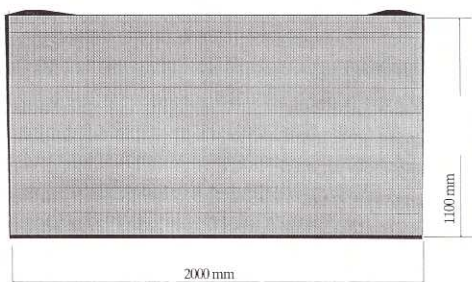
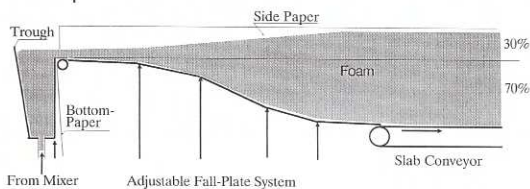
The new type machine works with 4-9 ancillary streams in addition to the basis Polyol, TDI and Methylene Chloride streams, the actual metering system is well proven to ensure equal and uniform quality of the foam produced.

The ancillary streams are for different catalysts, pigment for different colours, water and air.

CAPACITY

The FP-200-FT Flat-top Machine is designed for through put of 150 kg chemicals per min and the machines can produce foam blocks in size up to 2000 mm (2080 mm) width and 1200 mm's height all depending on selected density and foam type.

Because of the square Flat-top and straight sides, the waste percentage can be limited to around 5-6 percent, which is much less than a traditional domed foaming plant will produce.



The variation of density in the block is reduced to a minimum. The outer skin of the block is thin and with fewer hard-points, therefore less trimming is required.

The HYMA Type FP-200-FT is designed for continuous production of flexible Polyether Polyurethane foam in rectangular blocks with flat top configuration. Type FP-200-FT is working on a low-pressure system with multiple mixer inlets and recirculation. The catalyst metering systems has as standard three main steams and auxiliary facilities for additional streams, extra colours / catalysts. The Closed foaming tunnel has a manually adjustable fall-plate system, sidewalls and infinitely variable speed driven conveyor.

THE PUMPING SYSTEM

All liquid components streams with gearpumps will feature variable frequency drives and re-circulation system.

Optional: The isocyanate pump can be of magnet driven type.

The optional water pump is a piston positive displacement model. The Air amount is metered by a precision needle valve situated just down the stream of the flow metre, to ensure that the flow measurement is independent of mixing head pressure.

Colour metering Unit for colours can be provided as an optional extra.

PUMP CONTROLS

The FP machines is fully equipped for control of the different pumps and other mechanical systems being part of the foaming process

For the Polyol, T.D.I. and Methylene Chloride the machine is delivered with pipework to mixing head.

Inlet and return connection points are provided for customers on site supplied piping.

Flow metres will be provided for T.D.I., water, MCL, and air. For the Water, Silicone, Stannous Octate and Amine stainless steel tanks will be provided.

As optional extra the machine can be supplied with an automatic change of foaming formulations.

MIXING HEAD

The mixhead is the high shear pin design. Powered by a suitable motor with mixer speeds as defined by change and pullens. The automatic valving on this mixhead consists of a manifold mounted three-way ball valve with Teflon seals.

In case of any problems all streams and mixer will automatically stop. The T.D.I. valve will shut in the event of power failure. The conveyor will still operate to move the chemicals / foam away.