

# HENNECKE PRESS-RELEASE

## Hand in Hand

**After an assembly period of only 2.5 months including plant optimisation, the Dutch enterprise EcoTherm B.V. – one of the three leading European manufacturers of PU insulating panels for the construction industry – was able to start production with one of Hennecke's new "High-Speed CONTIMATs".**

Although the construction industry's outlook is rather grim, the demand for PU-insulating panels is booming thanks to the continuing trend to save energy. With great foresight, major manufacturers are therefore expanding their production capacities. Just like EcoTherm, based in Winterwijk near the Dutch-German border – a subsidiary of the Irish building materials giant CRH with 50,000 employees world-wide and an annual turnover of almost 11 billion Euro in 2002.

The high-tech production line is EcoTherm's first system from Hennecke. It was put into operation at EcoTherm's main production site in the Netherlands in September 2003. The line is a high-speed CONTIMAT, type CM 30, for the continuous production of insulating panels made of rigid polyurethane foam based on PU/PIR with flexible facings on both sides. In the construction branch, these insulating panels are used on a grand scale, for instance to insulate steep or flat roofs, floors, stables or outer walls of buildings.

A finished insulating panel  
leaves the CONTIMAT

*Photo: Hennecke GmbH*



As the production line is also used to process special PIR raw material systems that are widespread in the USA, Hennecke's experts have thought up some technological extras. PIR foams require a more precise temperature control at higher temperature levels than PU foams (see

box). This is why Hennecke has developed a new, extremely efficient and energy-saving temperature control system that heats the CONTIMAT's steel support plates to a temperature of up to 80 °C through direct admission of hot air. This type of temperature control system is based on a double-circuit system – this means that the temperatures for top and bottom conveyor can be controlled separately. This allows a direct influence on temperature control, which is of special importance in the manufacture of thick panels since the foam's exothermal heat increases with thickness.

The feed table for the support and guidance of the bottom facing can also be heated (up to 70°C) to boost the reaction of the raw material mixture. Vice versa, cooling is also possible if a different type of formulation is to be processed.

### **Spindle-type lifting system replaces hydraulic system**

While conventional production lines utilize hydraulic systems requiring the insertion of mechanical spacers to set the requested panel thickness, the CONTIMAT top conveyor is raised via spindle-type lifting elements ensuring a parallel and precise lift. Hence, the insertion of spacers becomes redundant. Combined with the proper drive system, the top conveyor can be set to the requested height with millimetre- precision. The distance between top and bottom conveyor, i.e. the panel thickness, can be automatically adjusted.

Raw-material dispense by 3 stationary high-pressure mixheads

*Photo: Hennecke GmbH*



### **Flexible in every respect**

The line is designed for a production capacity of 20 to 60 metres of insulating panels per minute. Panels with a thickness between 10 and over 200 millimetres can be implemented and all types of flexible facings can be processed as used in similar production lines, such as kraft paper, aluminium foil, bituminous felt or flexible facings with glass fibre coating. Three stationary

high-pressure mixheads - that can be controlled individually or in synchronism - have been installed for blending and dispensing the mixture. Additives are added to polyol in an on-line process, i.e. simultaneously with the processing operation. More than ten components can be added to polyol at the same time. The environmentally compatible substance pentane is used as a blowing agent. For this purpose, the line has been equipped with Hennecke's Pentane Process Technology (PPT). If required, however, other blowing agents can also be processed. Prior to delivery, the CONTIMAT was completely assembled and tested at Hennecke's production site in Sankt Augustin. Only ten weeks had passed from the beginning of the assembly work to the first test run. Joep Willemsen, EcoTherm's Operations Director attributes this primarily to the excellent preparation, coordination and cooperation of all members of the project team (see the following interview).

## Hennecke's technology is our yardstick

**Beside their works in the Netherlands, EcoTherm B.V. has a production site in England as well as a number of subsidiaries in Germany and Poland. Including their investment for packing, storage and delivery, the company has invested almost five million Euro in the new production line in Winterswijk. We have discussed this subject with Joep Willemsen, EcoTherm's Operations Director.**



Joep Willemsen, Operations Director at EcoTherm

*Photo: Hennecke GmbH*

EDITOR: Mr. Willemsen, in spite of the slump in the construction branch, you have made sizeable investments in a line that produces insulating panels for the building industry. Don't you think that this is too risky?

WILLEMSSEN: We are not that pessimistic about the economic outlook as we sell our products throughout Europe. Therefore, cyclical fluctuations in individual countries are offset. What is crucial for us, is the fact that the insulation of buildings plays an increasingly important role. For

quite a long time, we have been noticing a growing trend to save energy in Europe. This is why we expect a continuously rising demand for insulating boards made of rigid polyurethane foam in future. Of course, we would like to be optimally prepared.

EDITOR: This is the first time you bought a Hennecke production line. How did you come to this decision?

WILLEMSSEN: When you are planning an investment of this magnitude, it is only natural to look out for the best technology available on the market. The USA have primarily served as an example to us, where insulating boards offering extremely high insulation resistances are produced in a very efficient way. More than 90 per cent of the technology used there has been developed by Hennecke Machinery. We wanted to transfer this state-of-the-art technology to our production site in Holland. I was impressed by the demonstration of a CONTIMAT made by Hennecke that has been in operation in the USA for more than 25 years and still achieves a very high production output.

EDITOR: Your new CONTIMAT also processes PIR systems with a very high reaction velocity like the types that are used in the USA. Which measures were required for this?

WILLEMSSEN: The plant technology was modified accordingly and new formulations had to be developed as the raw materials used in Europe differ from those in the USA. Therefore, we set up a kind of working-group with members from EcoTherm, the mechanical engineering companies Hennecke and Kraft as well as the major raw material suppliers, among them Hennecke's parent company, Bayer Polymers. All participants of the group were highly cooperative achieving excellent results.

EDITOR: How do you assess the order processing through Hennecke?

WILLEMSSEN: Before placing the actual order in December 2002, we had already had highly intensive discussions where all technical questions were debated in detail. Hennecke's employees have convinced us essentially through their impressive consulting competence and their vast experience. Accordingly, the order was handled smoothly and speedily. We were able to start the first test production after only a few weeks of assembly work.

The fact that the future machine operators were involved in the project right from the start has made a very positive impression on us. This meant that we were able to work together on a very close and personal level and so our machine operators now run the plant with great expertise.

Since the beginning of September 2003, the new CONTIMAT has been successfully running in multi-shift operation.

EDITOR: Thank you very much for this interview, Mr. Willemsen.

## PU / PIR – what is the difference?

PU foam (polyurethane) consists in approximately equal shares of a polyol mix with an activator and additives as well as isocyanate (MDI). This proportion of ingredients corresponds to an index of 100. To achieve fire classification B2, insulating boards made of PU foam with flexible facings require a relatively large amount of added flame retardants. These, however, will slow down the curing process.

The proportion of ingredients in PIR foams (polyisocyanurate) is made up of at least 220 parts of isocyanate related to 100 parts of polyol mixture. This corresponds to an index of 220. While PU foams go through just one chemical process, i.e. the reaction of the polyol's hydroxyl group with the isocyanate's NCO group, PIR foams react twice. Three NCO groups each of the excess isocyanate form a ring structure. An ambient temperature of at least 60 °C is required to start this reaction that is called trimerisation. For this reason, the corresponding plant parts need to be heated. Additionally, the reaction heat from the first chemical reaction is exploited.

To achieve fire classification B2, insulating boards made of PIR foam require no or just a very small quantity of added flame retardant depending on the index, as a thicker, protective carbon film is formed through the effects of heat due to the higher content of bound carbon. Furthermore, PIR compounds start to disintegrate at higher temperatures than PU compounds, as the trimerisation's ring structure is very stable.

PIR foams require a shorter curing time than PU foams, which in turn offers the benefit of a higher production speed. On the other hand, PIR foams are brittle than PUR foam, hence require a high-precision temperature control of the laminator to ensure an optimum adhesion of the foam to the two facings.

### More information:

Thomas Kirsten  
Manager Marketing-Communication  
Tel. + 49 2241 339-297  
Fax. + 49 2241 339-974  
e-mail: [thomas.kirsten.tk@hennecke.com](mailto:thomas.kirsten.tk@hennecke.com)

**Hennecke**   
Polyurethane Technology

Hennecke GmbH  
Polyurethane Technology  
Birlinghovener Str. 30  
D – 53754 Sankt Augustin

A  Bayer Polymers Company