PRECAST MACHINERY

Hollow Core and More
Echo Precast Engineering has its head office in Houthalen in Belgium. It develops and constructs machinery and plants for the production of pre-stressed concrete products on beds. Over the course of the years our technical expertise and engineering services have made a name for us on the international market.

We combine our experience, gained over many years, with tailor-made solutions to offer our customers essential competitive advantages. Our main priorities are energy and cost efficiency, plus sustainable construction techniques. Pre-stressed concrete elements such as hollow core slabs satisfy all these criteria and thus make a considerable contribution to forward-looking construction techniques.
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Residential Construction

1. Solid walls
2. Hollow core slabs
3. Solid slabs
4. Sandwich wall
5. Facade wall
6. Elevator shaft
7. Stairs
8. Foundations
1 Hollow core slabs
2 Wall systems
3 Various precast elements
Why Hollow Core?

**EFFICIENT**
Optimum use of materials and low self-weight

The advantage of pre-stressed concrete hollow core slabs over other types of floor structures is their efficient use of materials.

Hollow core slabs require a high grade of concrete and steel. Therefore the same load ratings can be achieved with use of fewer materials than in cast-in-situ concrete slabs. Up to 45% of concrete is saved in comparison with floors produced by the cast-in-situ concrete construction method.

**SUSTAINABLE**
Environmentally-friendly

Hollow core slabs offer a range of ecological advantages:
- Less total waste (waste material is processed and reused)
- Renovation becomes simpler and faster (existing buildings can be renovated, rather than demolished)
- Less primary energy consumption

Thermally activated floors
Concrete plays a significant role in the reduction of the use of energy for heating and cooling, mainly because of its capacity to store and subsequently release warmth and cold. Thermally activated floors can store thermal energy because water pipes are embedded in the hollow core floor units during casting.

**VERSATILE**
Wide range of uses

Hollow core slabs are suitable for a range of purposes: They offer the best possible solutions for the residential, hospital, school, industrial, commercial and other markets.

**FAST**
Speedy construction progress

In the past delays in construction were accepted as the consequence of the slowness of conventional construction methods. Today the demand for a fast return on investment is becoming ever more urgent. Hollow core slabs significantly reduce construction time.

**EASY**
Safe, pleasant working environment

Precast construction plants offer a safe, healthy working environment at comfortable temperatures. Production is based on strictly monitored industrial processes. Therefore, potential pollution sources from noise, dust and toxic substances are easy to identify and rectify. In addition, the production of hollow core slabs offers a huge saving in labour costs.

**SAFE**
Outstanding fire resistance

Since the 1970's European, American and Japanese laboratories have conducted more than 1000 fire tests on pre-stressed hollow core floor units. The results speak for themselves: Floors with normal connections to the supporting structure are fire resistant for 2 to 3 hours both for bending and for shear loading.

**Additional safety in seismic zones**
Slipform technology can provide hollow core slabs with seismic incisions on the lateral edges to increase seismic resistance.

Hollow core slabs use up to 45% less concrete and 30% less steel than conventional massive constructions.

= saves money and protects the environment.
Production Plant for Pre-stressed and Reinforced Precast Concrete Elements on Beds

Echo Precast Engineering is not only a machine constructor, it also supplies tailor-made production plants. We offer a broad range of different technologies for the manufacture of pre-stressed or reinforced precast concrete elements. The pre-stressed products range from hollow core slabs in various dimensions and designs through window lintels, beams, lattice girder floors, double T girders and vine stakes to very sophisticated elements such as foundation piles and thermally activated floors. The spectrum of reinforced elements also offers a variety of production possibilities such as driven piles and lattice girder floors. As well as supplying entire machines and plants we put the entirety of our engineering know-how at your disposal.
Echo Precast Engineering sees itself not just as a purely mechanical engineering firm, it also offers many years of experience in this sector, coupled with specialist knowledge and support in the precast concrete plant construction. Together with our sister companies, the Belgian company constructs and delivers complete plants for automated production of reinforced and pre-stressed concrete elements. We produce and supply machines, oversee the commissioning of the machinery and ensure a smooth start to production.

Of course we are also there for our customers after delivery and our after-sales team are delighted to assist you at any time.

At our head office in Houthalen we manufacture not only tailor-made machinery and plants, we also conduct practical tests on the in-house test plant. On the one hand this facility allows us to demonstrate our machines in production to our customers and on the other to work on new developments. Our objective is, jointly with our customers, to find leading-edge solutions to their production requirements.

As a company within the PROGRESS GROUP, Echo Precast Engineering has set itself the target of supporting its customers from A to Z and has created the Preteco service programme. This service allows us to assist our customers in the successful planning and implementation of their construction projects.
The S-Liner slipformer from Echo Precast Engineering is the ideal solution for versatile, flexible production requirements. As well as hollow core slabs, foundation piles, solid floors, joists, lintels, guttering, vine stakes and even insulated slabs with integral heating and cooling systems can be manufactured.

This versatility is made possible by the modular machine structure. Height differences in the same product series can be produced by quick, problem-free changing of the tube and mould set. Replacing the production module makes changing from production of one product to another even faster.

The specific construction of the S-Liner slipformer and the use of earth-moist concrete make it exceptionally cost-efficient and easy to use and maintain.

The Echo Precast Engineering universal slipformer makes it possible to produce hollow core slabs from 6 – 50 cm in height.

The machine is not limited to the production of hollow core slabs, but can also be used for a complete range of other products, such as beams, lintels, foundation piles, gutters, as well as floors with insulation or incorporated heating/cooling systems.

This machine also stands out because of its modular structure. Height differences in the same product series can be produced by quick, problem-free changing of the tube set. Replacing the production module makes changing from production of one product to another even faster.
Wall Panel Slipformer

Whereas a normal slipformer is used for the production of “grey” wall panels, a special slipformer has been developed to produce wall panels with exposed aggregates – in a single production run. The slipformer for wall panels is a special machine type with the same design as the slipformer S-Liner® T30, but with a wider frame. The wider frame means that the machine can be equipped with an additional concrete supply hopper. Whereas the normal hopper contains the usual grey concrete and is designed for the manufacture of hollow core slabs, this third hopper is loaded with colourised concrete (a mixture of sand, coloured aggregates and white cement).

As well as the extended frame the machine also has a special smoother with improved finishing features.

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Extruder X-Liner® CC

X-Liner® CC

The Extruder X-Liner® CC stands out from the crowd because of its high product quality, saving on material and long service life.

In comparison with the Shear Compaction method of compaction the Core Compaction method makes it possible to use less water and cement with no change in concrete strength. In addition, this technology prevents slippage of strands.

The result is hollow core slabs with high load-bearing capacity and extreme precision in product height and cavities.

The simple, sturdy construction of the X-Liner® and the fact that it has very few moving parts guarantee a long life expectancy and a minimum of wearing parts.

Dimensions of the Hollow Core Slabs

Our cross-sections comply with the Eurocode as well as with EN 1168. By altering the concrete strength and reinforcement pattern it is possible to adjust the ratio between load and span to the optimum for concrete applications.
Extruder X-Liner® FC

The Extruder X-Liner FC is a machine designed for the manufacture of pre-stressed hollow core slabs, which are at the top of their class because of their tried and tested technology and ease of operation. The X-Liner FC is a fully automatic machine, easy to adjust and completely controllable. It is possible not only to adjust the concrete formula but also the core of the machine, the screws can be individually adjusted. This allows to vary the production speed and thus the optimization of the whole production process.

The modular machine design makes it easy to maintain and clean this highly reliable, easy to operate machine. This machine will allow you to produce concrete hollow core slabs, which are not only high quality but also guarantee high fire resistance.

Our “shark screws”, which are shaped like a shark’s fin, are designed to optimise the piling of the concrete and to increase compaction and speed of production. Our new structural tubing system increases compaction and reduces wear and tear.

The separate control of each screw also improves production speed, compaction and reduces wear and tear. The machine is exceptionally easy to access and to maintain.

X-Liner® FC

Dimensions of the Hollow Core Slabs

Our cross-sections comply with the Eurocode as well as with EN 1168. By altering the concrete strength and reinforcement pattern it is possible to adjust the ratio between load and span to the optimum for concrete applications.
### Technical Data

#### Slipformer

<table>
<thead>
<tr>
<th>Types</th>
<th>Selection/availability of machines</th>
<th>Power rating in KW/HP</th>
<th>1,2 m wide</th>
<th>1,5 m wide</th>
<th>2,4 m wide</th>
<th>2,4 m × 28 m</th>
<th>2,4 m × 1,2 m</th>
<th>4 × 28 m</th>
<th>4 × 1,2 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universal Slipformer</td>
<td></td>
<td>23 KW / 31 HP</td>
<td>24 KW / 32 HP</td>
<td>29 KW / 39 HP</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>T 30</td>
<td></td>
<td>26 KW / 35 HP</td>
<td>27 KW / 36 HP</td>
<td>32 KW / 43 HP</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>T 40</td>
<td></td>
<td>26 KW / 35 HP</td>
<td>27 KW / 36 HP</td>
<td>32 KW / 43 HP</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>T 50</td>
<td></td>
<td>26 KW / 35 HP</td>
<td>27 KW / 36 HP</td>
<td>32 KW / 43 HP</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Wall panel Slipformer</td>
<td></td>
<td>25 KW / 34 HP</td>
<td>26 KW / 35 HP</td>
<td>31 KW / 42 HP</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Topping machine</td>
<td></td>
<td>24 KW / 32 HP</td>
<td>25 KW / 32 HP</td>
<td>26 KW / 38 HP</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

#### Extruder

<table>
<thead>
<tr>
<th>Method of compaction</th>
<th>Selection/availability of machines</th>
<th>Power rating in KW</th>
<th>Machine dimensions</th>
<th>Concrete container capacity</th>
<th>Control system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core compaction CC</td>
<td>15 - 40 cm</td>
<td>35 - 45 KW</td>
<td>Length: 4.5 m</td>
<td>Volume: 1.5 m³</td>
<td>PC control system</td>
</tr>
<tr>
<td>Flow compaction FC</td>
<td>15 - 50 cm</td>
<td>40 - 45 KW</td>
<td>Length: 4.5 m</td>
<td>Volume: 1.5 m³</td>
<td>PC control system</td>
</tr>
</tbody>
</table>
Multi-angle Sawing Machine
MAS

The Multi-angle Sawing Machine makes it possible to cut the cured slabs to the desired length at various angles. Lengthwise sawing at 0 or 180 degrees, and diagonal sawing at all angles between 90 and 0 degrees as well as 90 and 180 degrees are possible. Sawing speed is adjusted automatically by means of the electronic sawing motor power control.

1.2 – 1.5 – 2.4 m wide

Right-angle Sawing Machine
RAS

The Right Angle Sawing Machine makes it possible to cut the cured slabs to the desired length at 90 degree angles on the production bed. The sawing machine uses diamond blades of 900, 1100 and 1300 mm to cut up to 30 cm, 40 cm and 50 cm thick slabs.

1.2 – 1.5 – 2.4 m wide
Sawing Machines

Fresh Concrete Sawing Machine FCS

The FCS is a simple saw model for the purpose of cutting fresh slabs lengthwise to non-standard widths for slabs smaller than those produced with the slipformer mould. The saw blade is electrically driven. To save costs a used diamond saw blade (Ø 1100 or 1300 mm) can also be used. The machine is manually operated by pushing it forward on roll guides and is fitted with a loose power cable.

1.2 – 1.5 – 2.4 m wide

<table>
<thead>
<tr>
<th>FCS</th>
<th>MAS T1100 (900-1100 mm)</th>
<th>MAS T1300 (1100-1300 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine dimensions (l x w x h) in m</td>
<td>4.245 x 1.82 x 2.53</td>
<td>4.245 x 1.82 x 2.73</td>
</tr>
<tr>
<td>Standard equipment</td>
<td>Saw blade Ø 900-1100 mm</td>
<td>Saw blade Ø 1100-1300 mm</td>
</tr>
<tr>
<td>Machine weight</td>
<td>± 6000 kg</td>
<td>± 6300 kg</td>
</tr>
<tr>
<td>Energy requirement</td>
<td>65 kW</td>
<td>65 kW</td>
</tr>
<tr>
<td>Rates of production</td>
<td>± 1.5-2 m/min, depending on the element and condition</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RAS</th>
<th>RAS T1100 (900-1100 mm)</th>
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<td></td>
</tr>
</tbody>
</table>

- Electrically driven
- Manual operation
- Robust design
**Automatic Plotter**

The Echo Precast Engineering automatic plotter makes it possible to draw data such as cutting angle, project identification and the area, which has to be cut away, and print it on the concrete slabs. It is possible to print both on the top and on both sides of the concrete slabs. The machine has an industrial PC. The data are transferred as a PXML file either by means of a USB storage device or by means of a wireless network connection and are checked by specialised software prior to being printed out.

Since the automatic plotter is battery-driven, no cabling is required for production.

1.2 – 1.5 – 2.4 m wide

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**Concrete Aspirator**

The concrete aspirator is used to remove non-cured concrete. It is mainly used for the removal of concrete from slots and for cleaning the space alongside the rails as well as the spaces between the production beds.

1.2 – 1.5 – 2.4 m wide
Multi-functional Trolley

The battery-driven multi-functional trolley is used for the preparation of a (new) bed and is designed to serve 3 functions:

- Cleans the production beds with rotating brushes
- Pulls the strand and wires along the production beds
- Oils the production beds

1.2 – 1.5 – 2.4 m wide

Lifting Equipment

Echo Precast Engineering develops and constructs tailor-made lifting equipment to customers’ specific requirements.

Our clamps are heavy-duty and have high load ratings. Their great advantage is that the clamps have pivoting clamps for gripping all concrete cross-sections. The lifting clamps feature quick engagement and release and thus ensure a smooth continuous work flow.
Production Beds

Standard Production Beds

Echo Precast Engineering constructs tailor-made production lines to customers’ specific requirements. These production lines are unique on the market and are based on many years of experience. They are constructed on our customers’ production site with the assistance and advice of our experienced technical team.

Benefits:
- The use of concrete beneath the steel plate ensures good thermal conductivity, resulting in the manufacture of high-quality end products
- The use of concrete beneath the steel plate also makes the transmission vibrations possible, resulting in outstanding compaction of the pre-stressed concrete hollow core slab
- Considerable savings in transport and material costs
- Very long life expectancy

Mobile Production Beds

Mobile Production Beds

Pre-assembled mobile production beds consist of a prefabricated steel construction, assembled on the production plant.

Benefits:
- Mobile production beds can be supplied with or without a heating system
- They can be removed and re-mounted at another location
- Rapid mounting, with low manpower requirement
Stressing Equipment

We develop and construct the entire pre-stressing system to customers’ specific requirements. Abutments are fitted at each end of the production bed. Reinforced concrete abutments are provided by the customer on site. Various types of pump assemblies and systems can be used to stress the strands or wires. The stressing jack size is matched to the cross-section of the reinforcing strands or wires.

Heating System

In order to increase the productivity and efficiency of a production plant, the production beds are fitted with a heating system (to ensure rapid, controlled curing). We supply both the technical specifications and the complete solution for the heating system.
Software for Precast Concrete Plants

The heart and greatest strength of a plant are the control of the machines and the software. The companies in the PROGRESS GROUP have the necessary know-how and the ideas to optimise your production by equipping your plants with the appropriate control technology. As well as drawing on our wealth of experience, the group uses an in-house, specialist software company to design plants with optimum networks for producers of precast concrete elements. Echo Precast Engineering offers a range of solutions for machines designed for the production of pre-stressed and reinforced precast elements on production beds.

The FloorOffice Suite includes software applications, such as AutoFloor for drawing, PreConSlab for designing and FloorDesk for planning and management. The FloorOffice software optimises your production process for hollow core slabs, solid slabs, large area slabs and other precast slab types. From the first contact with your customer to the final delivery, the whole process is covered by FloorOffice.
Seismic Safety

The Echo Precast Engineering slipformer is designed to produce hollow core slabs, which offer additional safety in regions at risk from earthquakes. This is ensured by producing hollow core slabs with sinusoidal profiles.

Properties of the elements:
- Improved connection between the elements with significantly higher shear strength for the entire storey
- Avoidance of an additional concrete layer
- System for reduced energy loss during seismic activity

Machinery from Echo Precast Engineering can also be upgraded at a later date to produce hollow core slabs with sinusoidal profiles.
The Echo Precast Engineering slipformers make it possible to produce on the production beds both the usual type of foundation pile and foundation piles with a point at the lower end.

The foundation piles can be pre-stressed or fitted with cage reinforcement.

Every existing and new slipformer can be fitted with the modules required to produce driven piles.

Maximum dimensions 400 x 400 mm

**Advantages of this mould-free production method:**
- Cost efficiency: Using dry concrete requires 20 - 25% less cement than the conventional moulding method, with the same impact strength
- Faster, simpler production
- Workforce savings – one machine operator is sufficient
- No time-intensive de-moulding, faster removal of the finished products
- Shorter curing times
- Easy cleaning – no arduous cleaning of the mould is necessary; all that is required is standard cleaning of the slipformer
Thermally Activated Slabs

Pre-stressed Hollow Core Slabs with Concrete Core Activation

The thermally activated slab facilitates heating and cooling with a single system. The precast elements therefore have a pipe system integrated into them near the surface. Water circulates in the pipes and depending on the temperature, cools the rooms by extracting heat or releases heat into the rooms and thus heats them. Since precast elements are so massive, they have very good storage capacity and therefore offer the ideal conditions for creating a pleasant indoor climate.

Advantages of thermally activated slabs:
- Cooling and/or heating
- Self-regulating system
- Sustainable
- Greater thermal comfort with lower energy requirement
- Ergonomic and fast (floor and heating/cooling system in one)
- Space-saving
- Cost-efficient (lower energy costs, less maintenance, integral pipes for heating and cooling)
Stationary Production

Battery Moulds

Battery moulds are designed for the vertical manufacture of solid walls and large-area reinforced precast elements of different dimensions. The number of matrixes, between which the concrete products are formed, are variably adjustable to suit the desired production capacity. The finely-ground moulding surfaces, the vibrators on the matrixes and a heating system guarantee an efficient production and excellent quality of the concrete elements.

Tilting Table

Tilting tables are designed for the horizontal manufacture of solid walls and large-area reinforced precast elements of different dimensions. High-frequency vibrators facilitate optimal compaction of the freshly poured concrete. The tilting tables can be equipped with a heating system to accelerate the concrete curing. The finely-ground moulding table guarantees a high quality of the concrete surface. The tilting table can be tilted up to 75° to allow the removal of the elements for optimizing their transport.

3D Moulds

3D moulds are designed to manufacture 3D concrete elements, such as bathrooms, garages, lift shafts or water tanks. All the models can be equipped with vibrators and a heating system.

Staircase Moulds

We can provide a wide range of solutions for manufacturing staircases: from single moulds or twin moulds for fixed, standard staircases to flexible moulds for staircases of different shapes and sizes. The moulds can also be provided with vibrators and a heating system.

Moulds for Columns

Different mould solutions are designed for manufacturing of residential and commercial buildings. The offered range goes from moulds for columns with or without corbels up to multi-functional shapes with variable adjustable sizes and shapes.

Moulds for Beams

These moulds can be used to produce pre-stressed or reinforced beams in many different shapes and sizes. A greater level of flexibility can be achieved by removing the side walls and using tilting elements.
Carrousel Plants for Semi-Prefabricated Elements

A very high production output can be achieved by the use of carrousel plants for the production of double walls and lattice girder floors. The high degree of automation make possible to have shorter cycle times and high quality, using only a small workforce. The ebos® control system visualises and optimises production planning. It is possible to produce easily manoeuvrable elements with a smooth surface on one or both sides; these may also be insulated (insulated double walls).

Carrousel Plants for Solid Precast Elements

Carrousel plants designed for the production of solid precast elements make it possible to manufacture solid walls and floors. The degree of automation can be flexibly adjusted, according to the number of operators required. The ebos® control system ensures optimum production planning.

Solid precast concrete elements are used with success all over the world as a cost-effective method of construction. In warmer regions solid wall construction without insulation is often used, but in all other regions a multi-layer, insulated solid wall, known as sandwich wall, is used. A solid slab may be used in floor construction.