SMART SOLUTIONS FOR
PRECAST CONCRETE PRODUCTION
WHAT IS PRECAST?

A fast, modern and energy-efficient way to build any kind of high-quality buildings

Precast is a smart, industrialized way to build any type of high quality, energy-efficient building not only in a short time frame but also cost-efficiently and safely. Precast means the transfer of work from a site to the controlled processes of a factory which supplies constant high quality and significantly improves productivity.

IT’S ENERGY EFFICIENT

Precast concrete has many energy-efficient characteristics: Precast buildings absorb and store surplus heat or cold, and slowly release these back to the air. As a result, the hollow cores in precast floors can be used to form cooling systems that use up to 50 percent less energy than air conditioning. As for sandwich wall elements, the special insulation layer can dramatically reduce the energy consumption of a building.

IT’S BEAUTIFUL

Precast can be made into any shape or color and finished with several techniques. With graphic concrete, durable patterns and images can be produced on precast concrete elements such as façades, wall panels and pavement slabs.

PRECAST MEANS:

- Short construction time
- Cost-efficient construction
- Smaller CO₂ footprint than in cast-in-situ construction
- Less cement, less water, less steel, less waste, less labor, less logistics
- Long lifetime of buildings
- Flexibility in layout
- Great architectural freedom
- High quality of buildings
- Better working environment
Pre-stressed hollow-core slabs stand as a good example of the raw material efficiency of precast: they provide savings of up to 45 percent in concrete compared with a plain cast-in-situ reinforced slab. At the same time, the amount of pre-stressing steel can be cut by 30 percent because of the lower self-weight. For an average apartment, this means savings of 14.4 tons of concrete and 275 kg steel.

Precast concrete is used in all kinds of buildings:

- Apartment houses
- Office buildings
- Shopping centres
- Public buildings
- Logistics facilities
- Industrial buildings
- Parking lots
- Villas
- Farming houses
- Boundary walls

Precast construction offers a safer and healthier working environment. At the factories, the processes are controlled and more automation is involved. At the construction sites less scaffolding is needed. No toxic substances are used and no chemical treatment is required to protect precast products. Carefully constructed, high-quality precast is safer for inhabitants as it does not provide a good breeding ground for harmful microbes – even as years go by.

Short construction time, cost-efficiency of the construction process and low lifecycle costs of the buildings make precast an optimal choice for large housing projects where efficiency and productivity play a key role.
OUR PROMISE.
PROFITABLE PRECAST.

Elematic is a world leader in precast floor and wall production technologies. Ever since 1959 - when the company first saw daylight on the drawing tables of two Finnish brothers, Pentti and Pauli Virtanen -Elematic has had a strong focus on technology development and pioneering innovations that match the needs of the precast concrete factories around the world. Today, as in the early days, this is reached through close co-operation with our customers.

WORLD’S 1ST CIRCULATION LINE

The Virtanen brothers first started as crane and mold manufacturers but, as precast started to gain the upper hand as a common building technology in Finland, they looked for new ways to serve the builders. In 1964, the brothers got an order for a new factory from one of the country’s largest builders of that time and, together with the customer, they designed a totally new kind of a line production - the world’s 1st circulation line - that included everything: moving molds, concrete transportation on rails, vibration and heat treatment. Not to mention the first battery mold in the world that could produce 60 partition walls at one go. This was a resounding success, and the company started to grow; soon heading for the export market.

INNOVATIVE, BOLD AND CO-OPERATIVE

Today the same innovative, bold and co-operative spirit is seen in our more than 230 currently valid patents, strong global customer relations and largest annual R&D investment in the industry. We are always on the look-out for smarter, more efficient and more profitable ways to produce precast. Based on our long experience in precast production technology, we believe that this comes not only from the best possible individual machines but, above all, from one whole efficiently-designed production system in which every aspect works in perfect harmony. That’s why we have gathered together all the required pieces for a profitable precast production process, right from the initial design stage until the end of the factory lifetime. We can be a one-stop supplier for your factory project.
LOWEST OPERATIONAL COSTS

Our production lines are optimized to supply the lowest operational costs in the precast business. When you begin building your factory, our experts will help you to find the most efficient factory lay-out for your production. Our project and installation professionals will see to it that you will not waste money on unnecessary delays and your factory will be up and running as scheduled. The individual machines are designed to be raw-material efficient, fast, easy-to-use and durable, and to work together in perfect concert.

BEST END PRODUCTS

We want you to be able to be proud of the products you supply to your customers. This is why we have advanced, patented and high-quality technologies for the different kinds of end products that guarantee the best possible end result. For example, shear compaction guarantees the best possible compaction result for hollow-core slabs, FaMe lightweight shuttering system makes it quick and easy to create precise shutterings for wall elements, and our tables and beds are made of sturdy steel with high load-bearing capacities, completely even surfaces and exact measurements.

LIFETIME COMMITMENT

We stand by you at every step of your precast production and help you to find the smartest match to your needs from the initial definition of precast investment to precast production renewal. Our experienced experts guide you from precast concept design and factory building design to machinery optimization, maintenance and renewal.
PROFITABLE SOLUTIONS FOR YOUR PRECAST NEEDS

FLOORS

PRO Floor suits for production of different types of precast products in the annual capacity range of 100,000 – 350,000 m². All the PRO key functions – concrete transportation, casting and cutting – are automated.

**BENEFITS IN BRIEF:**
- Low energy consumption as bed needs no heating of extra concrete
- Fewer machines and lifts required thanks to sawpreparer, a clever combination of sawing, cleaning and strand pulling.

**PRO WALL**

PRO Wall offers annual production capacity of 170,000 – 300,000 m². All the PRO line’s key functions are automated and it is designed to supply the lowest possible operational costs and the best end products. The PRO Wall line consists of the circulation line and as options battery molds and tilting tables.

**BENEFITS IN BRIEF:**
- Compaction and tilting with a practical multifunction wagon
- Fast and accurate casting without wasting concrete
- High quality tables with sturdy steel construction and completely even surfaces

WALLS

**SEMI WALL**

SEMI Wall suits for annual capacity need of 70,000 – 150,000 m². The line features basic and easy-to-learn technology.

**BENEFITS IN BRIEF:**
- Low cement consumption and production costs thanks to advanced shear compaction
- Significant savings in time and money with entirely automated concrete transportation
- Fast transportation and distribution of concrete

**SEMI FLOOR**

SEMI Floor is a smart choice for anyone looking for a production capacity in the range of 35,000 – 150,000 m² annually, and a line that does not require a high initial investment. SEMI Floor features straightforward and easy-to-learn basic technology.

**BENEFITS IN BRIEF:**
- Fast and cost-efficient production
- High productivity
- Accurate end products with automated functions
- Optimised production with ELiPLAN enterprise resource planning and FloorMES manufacturing execution system

**PRO FLOOR**

PRO Floor suits for production of different types of precast products in the annual capacity range of 100,000 – 350,000 m². All the PRO key functions – concrete transportation, casting and cutting – are automated.

**BENEFITS IN BRIEF:**
- Low cement consumption and production costs thanks to advanced shear compaction
- Significant savings in time and money with entirely automated concrete transportation
- Flexible production

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**BENEFITS IN BRIEF:**
- Cost-efficient and multifunction robot shuttering with accurate end-product dimensions.
- Flexible automated multi-product production flow with a transfer wagon
- Optimal curing results with automatic curing and humidity control
- Fast transportation and distribution of concrete

**EDGE WALL**

EDGE Wall is an answer to the need for high capacity production. The line offers an annual capacity range of 400,000 – 750,000 m² and a wide product range. The EDGE production line consists of a circulating wall line and as options battery molds and tilting tables.

**BENEFITS IN BRIEF:**
- Fast and cost-efficient production
- High productivity
- Accurate end products with automated functions
- Optimised production with ELiPLAN enterprise resource planning and FloorMES manufacturing execution system

**EDGE FLOOR**

EDGE Floor is designed for those in need of a very high capacity in the annual range of 150,000 – 800,000 m², a wide product range and highly automated precast production. The EDGE line features a high automation level with fully automatic casting, creation of openings, water holes, sawing and concrete transportation.

**BENEFITS IN BRIEF:**
- Fast and cost-efficient production
- High productivity
- Accurate end products with automated functions
- Optimised production with ELiPLAN enterprise resource planning and FloorMES manufacturing execution system

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**BENEFITS IN BRIEF:**
- Low operational costs thanks to smooth table circulation between the different process steps
- Efficient and time-saving shuttering process with FaMe system
- Efficient use of space due to curing in stacks

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ELiPLAN enterprise resource planning system

ELiPLAN is an enterprise resource planning system especially designed for optimizing the use of precast concrete factory resources and minimizing waste. It operates at PRO and EDGE technology levels. ELiPLAN provides comprehensive support for the sales, material management, production, warehouse management, transportation, and machinery maintenance processes.

FloorMES E9 manufacturing execution system

FloorMES E9 offers a complete solution to optimize hollow core slab production. It enhances production planning, monitoring, and analyzing, ensuring smooth and continuous precast floor production.

PRODUCTION OPTIMIZATION & AUTOMATION

ACOTEC NON-LOAD BEARING PARTITION WALLS

Elematic Acotec production technology offers a clever way of manufacturing lightweight, non-load bearing, room-high precast partition wall panels. This technology is designed to operate at PRO and EDGE technology levels. ACOTEC NON-LOAD BEARING PARTITION WALLS are lightweight and non-load bearing, ensuring smooth and continuous precast floor production.

ACOTEC FOUNDATION LINE

The Elematic foundation line is equipped with the world’s most efficient pile casting machine, allowing for up to 8 parallel pile molds to be cast at once. A compact mold layout provides flexible pile length adjustment, reinforcement, and demolding, making it a faster and more efficient solution.

ACOTEC FRAME LINE

This Elematic production line specializes in prestressed and reinforced beams and columns with high load-bearing capacity. It offers flexible production and can be adapted with the introduction of the production line.

ACOTEC Batching and Mixing Plants

Elematic offers a range of proven and highly sophisticated batching and mixing solutions. A fully automated control system ensures the correct mix with the optimal ratio of raw materials for maximum profitability.

ACOTEC Battery Molds

Efficient vertical casting of large solid walls in space-saving cassettes is possible with Elematic battery molds. A two-sided cold shutter battery mold doubles the production capacity and allows for high-quality production.

ACOTEC Building Tables

Tables with sturdy, flat steel surfaces ensure excellent quality of end products and minimal finishing work at the site. Elematic tables come in multiple sizes and are also available in a hydraulic tilting version. They are designed to handle multiple ranges of precast walls, beams, and columns.

ACOTEC Beds

The inside heating pipes and heavy-duty structure of Elematic beds ensure the profitable manufacture of high-quality floor products as well as maximizing bed lifetime. The beds have standard widths of 1200, 1500, 1800, and 2400 mm.

ACOTEC Concrete Transportation

Elematic automatic concrete transportation is a fast and reliable method of distributing concrete between the B&M plant and desired casting positions. Narrow track design allows for efficient use of floor space. The system is also easy to adapt to existing batching and mixing plants.

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WORKING TOGETHER FOR CONCRETE RESULTS

Based on years of experience on the needs of the precast factories around the world, we have created a range of services to support you in your precast operation and to provide you with concrete results: improved profitability, better efficiency and higher uptime.

EXPERT CARE
We offer continuing expert care to ensure higher uptime. A comprehensive range of services and technical support are available to you throughout the lifetime of your precast plant: from commissioning and maintenance, to upgrades and modernization.

Our experienced service experts can help you to resolve any issues you may have, using proven industry best practices. Fast support is provided by our Helpdesk services in four locations: Finland, USA, UAE and India.

GROW WITH CONSULTATION
Together with Elematic’s consultation services, your operation can reach new heights of profitability. We can help you to detect bottlenecks, optimize production, and find the most cost effective recipes to improve your efficiency and ensure a higher return on your investment.

SERVICE AGREEMENTS
The Elematic service agreement protects your equipment investment and increases uptime. Our top priority is to keep your production running. The agreement covers the helpdesk, regular maintenance visits, as well as machine and equipment audits and training. Currently around 300 units of equipment are covered by our service agreements all over the world.

HELPDESK
In the case of a sudden or unexpected precast production problem, the Elematic Helpdesk is your first point of contact. You will receive swift, expert help in finding and fixing the problem through remote connect, over the phone or by email. In multiple languages. 24/7.

SPARE AND WEAR PARTS
Spare part availability plays a key role in the smooth running of a precast factory which is why we have over 3,000 spare part items available in stock for fast delivery from three different locations: Finland, the UAE and the USA. But it’s not just about the availability of spare parts but also about their quality: the OEM wear parts have proved to be the highest performers, with the longest service life. Fulfiling the strictest ISO 9001 requirements, each spare and wear part provides the original Elematic quality with warranty and is guaranteed to fit your equipment.

ELEMATIC E-SHOP
The Elematic E-shop is open 24/7, enabling you to review and order high quality Elematic spare and wear parts at your convenience. To achieve the highest productivity, parts availability matters.
EFFICIENT DESIGN PAVES YOUR WAY TO SUCCESS

Are you considering starting a precast production? Our precast design services support your project, allowing you to implement the most successful precast solutions. We are here to help you every step of the way.

We offer precast expertise for your project from the initial stages of concept design — how to best apply precast to your specific project - through to precast factory design and product design to structural engineering for precast buildings.

The collaboration begins by reviewing your targets and plans, so our experts can help you to find the best solutions for your precast business: Solutions that ensure the lowest operational costs and best end products. We are committed to your factory’s success throughout its entire lifetime.

CONCEPT DESIGN AND FEASIBILITY STUDIES
We’ll help you to plan a precast production that meets your targets.

- Methods to optimize construction by using precast concrete technology
- Selecting the right types of precast products
- Feasibility studies with profitability calculations
- Support with financing arrangements and negotiations

PRECAST PLANT DESIGN
Our experts can design an optimal plant layout, as well as consult with you during preliminary production planning.

- Plant capacity and flexibility
- Precast plant and machinery requirements
- Level of automation and manning
- Plant lay-out and material flow from production to storage and transportation
- Structural design for the plant
- Plant and machine foundation design

PRECAST PRODUCT DESIGN
We’ll provide you with advice about the best precast products that are cost effective to produce and easy to handle at the construction site. We coordinate the design process with all parties involved.

- Structural analysis and design of precast elements
- Stability analysis: gravity, lateral - wind and seismic
- Connections design
- Converting conventional designs to precast structural designs
- Execution and element production drawings

“Knowledge plays an essential part in implementing precast successfully. We have a global team with knowledge of different components of precast production and building design.”

Prakash Shah,
Head of Technical support team, Elematic India
Elematic project management has experience from hundreds of projects everywhere in the world — so we’ve learnt a thing or two along the way about what makes or breaks a delivery.

Regular contact
Project success most often depends on comprehensive and correct initial information, skilled engineering and knowhow but, above all, on close co-operation between us and you. Therefore, at Elematic, you will always have one single point of contact assigned for all project-related matters and the assigned project manager will keep in regular contact throughout the entire project. We promise that a response to your questions will come within one working day.

Count on professionals
Our project managers are at your call, all the way. They’ve been through the process dozens of times so you can rest assured: the project manager will already know what is coming ahead and make sure that everything proceeds smoothly from start to end. And it is actually worth a lot as one-month delay in factory start-up can cost more than 6 million euros. Thus, it really is a smart choice to get our professionals onto your team.

ON-TIME DELIVERY FOR EFFICIENT CASH FLOW

On-time delivery of the precast plant has a big influence on the cash flow and the success of the whole factory. But a successful project is not just a matter of delivering the equipment. Sometimes it is about the right concrete recipe, sometimes it can include construction engineering, optimizing the production or maintenance training. Whatever the needs, the faster they are attended to and the faster the factory is up and running, the faster you will receive return on your investment.
In fact, we launch several new machines or technologies every year. New innovations and solutions are discovered not only by listening to our customers and our long experience in the industry but also via our team's passion for precast excellence, their courageous experiments and close co-operation with universities and research institutes. We believe in purposeful machine design, down to the finest detail, to make our equipment as productive and durable as possible. We have also done our best to make all components, from one single machine to the whole production line, play together as smoothly and effortlessly as possible in order to give you the lowest operational costs and best end products.

Elematic has the ownership of many original precast concrete production technologies, such as Elematic shear compaction technology, Roth slipformer technology and Acotec® partition wall technology. They are concrete innovation examples that have helped our customers worldwide in their everyday precast challenges.

**SHEAR COMPACTION**

At the end of 70's, Elematic started a development project wishing to decrease the noise caused by concrete compaction. In 1985 the technology was commercialized and the 1st shear compaction machine was launched. The current, 4th generation of shear compaction brings even more compaction power and, above all, remarkably low cement consumption; even 100 kilos less than with any other technology.

**FASTENING METHOD**

FaRE, a fast preparation of side forms and openings with light, recyclable aluminum profiles and magnets, offers a safe, time-saving and versatile means to shape precast concrete products to any specifications.

**Sawpreparer**

A smart combination of a saw and preparer for cutting, cleaning and pulling strands for SEMI floor lines. This cuts the number of required lifts in half and needs only one operator.

**Wall production automation**

The fully-automated Elematic EDGE wall line optimizes the whole precast wall production from building design all the way to the construction site. The line features advanced software, a shuttering robot, modern table circulation and state-of-the-art production machinery, and its automated functions cover planning, monitoring and controlling of the production process.

**ATREX continuous crushing mixer**

The new ATREX® continuous crushing mixer offers a solution for raw material procurement. Thanks to it, lightweight aggregate up to grade 30 can be used in Acotec lightweight partition wall panel production.

For decades, we at Elematic have put a serious effort on serving the precast industry with continuous development – smart evolution – that produces new innovations, both big and small to help you get the most out of your business. With our 230 currently valid patents and largest yearly R&D investment in the industry, we aim at designing even more efficient, safe and user-friendly machines and technologies to generate true added value for your business.
Elematic is known for high quality. That is no wonder, since we have always taken quality seriously. Our well-defined quality processes cover all our operations from design and manufacture to customer service and sales. We have an efficient feedback mechanism and regular internal audits that ensure our operations continue to improve and you, as our customer, avoid unnecessary defects or shortcomings.

Elematic has equipment production in three units: Akaa and Riihimäki in Finland, and Alwar in India. Each production unit has a designated quality control person who is responsible for checking deliveries based on a pre-defined checklist. The inspection of each device results in an inspection report that guarantees compliance with relevant requirements.

We select our vendors carefully using criteria based on our long experience. Our quality control also includes regular random checks both in our own units and the production units of our partners and vendors. Systematic and well-documented quality processes that are continuously updated ensure that we can guarantee the best quality in all our locations around the world. Elematic holds the ISO 9001 certification that guarantees thoroughly managed business processes.

“Our goal is that you are happy with everything you receive from us – not just with the efficient plant and functional equipment, but also with our total delivery and the support and service we provide.”

Toni Koitmaa, Quality Manager
SOME OF OUR RECENT REFERENCES

HANWHA E&C, IRAQ
To build a new satellite city in the vicinity of Baghdad, Hanwha E&C ordered a new precast plant from Elematic. Elematic’s delivery for the world’s largest full-scale precast factory contained 3 B&M plants, 4 PRO Wall lines and 4 PRO Floor lines. They produce precast elements for the Bismayah New City housing project.

BLOCK BERGE BYGG, NORWAY
One of the Scandinavian forerunners in the adoption of new precasting technologies. Elematic supports leadership by supplying production solutions for more extensive and energy-saving construction demands. BBB’s production plant consists of the hollow-core slab and wall production lines with multifunctional machinery and special molds. ELiPLAN ERP is integrated in their production.

SHANGHAI URBAN, CHINA
Chinese construction group STEC’s invested in sophisticated and flexible precast production capability. Elematic delivery contained a circulating EDGE Wall Line for façade, solid wall and wall panel production.

REDX, BAHRAIN
In the Kingdom of Bahrain, precast concrete manufacturer RedX Industries is dramatically stepping up its production of hollow core products for the national building market. RedX’s increase in output follows the recent installation and commissioning of new lines with Elematic. The Elematic team on site have installed three additional hollow core beds with an E9 Extruder, SS-400 saw and two nozzle modules.

KARKAS MONOLIT, RUSSIA
Karkas Monolit’s new factory with modern Elematic precast technology reshapes the traditional construction market in the Nizhny Novgorod region in Russia. The new plant is equipped with a production line for sandwich and partition wall panels and piles, molds and machinery for producing ventilation shafts and stairs, a concrete transportation system, and a fast FaMe shuttering system.

BN PRECAST, INDIA
BN Precast Pvt. Ltd has been conceived to usher in a new way of industrialized construction that provides precast elements for extremely durable, affordable, adaptable, livable and environmentally sustainable buildings that have high consistent quality and ensure high efficiency fast construction. BM Precast produces non-load bearing partition walls with the Elematic Acotec line.

B.G. SHIRKE: INDIA
Shirke has pioneered and patented a 3-S system in India, a system that uses precast structural components and provides stability of the structure incorporating earthquake resistance, safety, adaptability to various climatic conditions, thermal insulation, acoustic insulation and conformity to the codal provision. Elematic’s delivery to Shirke included a circulation line for special walls, a circulation line for room-size floor slabs, a circulation line for special hollow columns, a floor slab production line with slipformer, concrete transportation system for all lines and ELiPlan enterprise resource planning system.

“...I have been visiting precast concrete factories around the world just to see how our factory can produce more with less workforce than any other company. Our factory is really excellent in terms of the layout and system setup.”

Bu Young Song
Team Manager, Plant Production Team
Hanwha E&C, Iraq Operations
OUR EXPERIENCE IS YOUR ADVANTAGE

“As a company, you always have to develop the operations. I strongly believe in continuous improvement, and this shows, for example, in our regular product and software launches. In 2015, we also opened two new factories: an assembly factory for key equipment in Finland and a mold factory in India for serving better the Indian market and the rest of Asia. We also started new services based on customer requests; among those are feasibility studies for moving from traditional construction methods into using precast, and how to use it optimally and how to handle the whole process. Behind successful precast businesses there are always knowledgeable and skilled people. We wish to share our experience with you, and also learn more with you every day. With all the latest technologies in our own hands and a long global experience I feel safe to say that we get a precast production up and running faster than anyone else in the business.”

Mats Jungar, Elematic CEO

FACTS IN BRIEF:

- Founded: 1959
- Deliveries: Over 3,700 worldwide
- Customers: In over 100 countries on 6 continents
- Global market share:
  - Hollow-core slab technology 60%
  - All precast concrete production technologies 40%
- Innovation capital: 230 currently valid patents
- Annual net sales: EUR 75 million
- Headquarters: Akaa, Finland
SMART SOLUTIONS FOR PRECAST CONCRETE PRODUCTION

Elematic provides precast concrete technology, production lines, equipment and related services that help customers succeed. We are the global technology and market leader in precast concrete technology for residential and non-residential buildings.

Our precast production technology is highly respected worldwide for its high quality, excellent productivity and efficiency, and advanced solutions. We believe in continuous improvement of our operations and offering to develop our customers’ business in a smart way. That’s why we are trusted by 40% of the world’s precasters.

www.elematic.com