



BETTER IDEAS FOR MODULAR HOUSES



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SURCO-LIMA 4.33
PERU *CAUAC*

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From the first **idea** to the final **part**, modular housing projects **100%** made in **Hockenheim**

In the second generation, Mathias, Andreas and Jörg Reymann, the sons of company founder Wolfgang Reymann, are steadily building on the know-how the company has been developing for over 40 years.

Over the past 40 years, a one-man engineer's office has grown into a whole group of companies whose ideas and products have revolutionised the entire precast concrete production process again and again.

Our drive to make everything that little bit better further reinforces our high-level process engineering expertise, creativity and strategic thinking.

Today we have over 70 employees, two production facilities, a worldwide distribution network and a burgeoning tradition of offering innovative and economic

solutions for the rationalisation in the production of precast concrete elements

That drive has led us to develop modular housing combined with upcrete® technology to a point where we have created economic and efficient precast concrete production methods which put us way ahead of the competition in terms of quality and flexibility.

This unique blend is what characterises the system and people behind those better ideas.

14° 4' 12" south – 75° 41' 6" west

The location from 2013 onwards of an entire town of 3,600 dwellings.
One of the greatest challenges of our time is to create living space, and we
have developed the technology to do so efficiently and economically.

MODULAR HOUSING PROJECT IN ICA, PERU

First contact between the two project partners Llaxta and Reymann Technik came in 2009. After initial meetings it quickly became clear that Reymann Technik's expertise, modular form units and upcrete® technology offered the perfect solution for a residential housing project of this scale.

The plan was to build 3,600 houses, each with 60 sq. m of living space as well as its own patio and garden, on a 100,000 sq. m site within a period of just 60 months. The houses are earthquake- and stormproof and provide a pleasant interior climate. In collaboration with the investor and a well-known Peruvian architect, Reymann Technik planned the precast concrete plant and subsequently executed the turnkey plant as the general contractor. From the first CAD drawings to the

very last part, the entire finished plant was produced in Hockenheim before being packed into 34 containers and shipped by sea to South America. The total shipment weighed 500 tonnes.

From the start to finish, in February 2013, the plant took just ten months to build. Even the specially constructed steel production hall was designed by Reymann Technik together with the client. After completion of the houses, rather than demolishing the production hall, it will be converted into the council offices and shopping centre for the new settlement.



Reymann Technik modular housing technology offers clear benefits.

Consumer surveys in countries with fast-growing populations and a huge demand for high-quality, affordable housing inspired us to develop our own modular housing system based on upcrete® technology.

That is how a highly efficient, economical system came into being, based on the very latest materials and knowledge. The system focuses on technical feasibility, the client's individual wishes, economical execution and the needs of future residents.

In 1974 Wolfgang Reymann founded the engineering firm Reymann Technik, and since then he has been developing his innovative production techniques for making structural elements cheaply and efficiently, including features such as the world's first CAD/CAM-controlled circulation plant for the manufacture of reinforced concrete flooring.

In 1996 the modular RATEC magnetic formwork system revolutionised traditional formwork techniques.

Since 2002 we have participated in the development of new production methods for ultra-efficient building construction using modular systems.

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CONSTRUCTION METHODS COMPARED

	Masonry construction - Solid construction by hand - Openings require post and lintel construction	In situ concrete - Solid construction - Extensive formwork necessary	Framing construction - Posts and beams share the load exerted by wall and floor elements - Bracing elements are needed	Panel frame construction - Large panel - Small panel - Panels perform load transfer - Semi-prefabrication with precast elements	Modular housing - Self-supporting room units - Load-bearing room units - Production process has strong influence on efficiency
Flexibility	✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓	✓
Construction progress	× ×	×	✓	✓ ✓	✓ ✓ ✓
Degree of prefabrication	× × ×	×	✓	✓ ✓	✓ ✓ ✓
Assembly effort	× × ×	× ×	×	✓	✓ ✓
Quality assurance	✓	× ×	✓	✓ ✓	✓ ✓ ✓

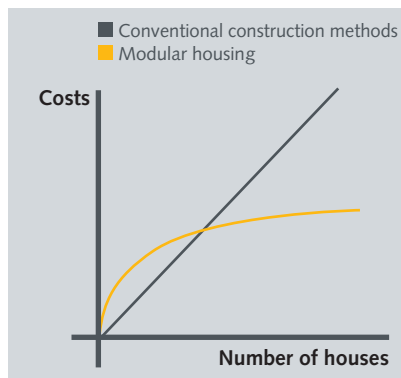


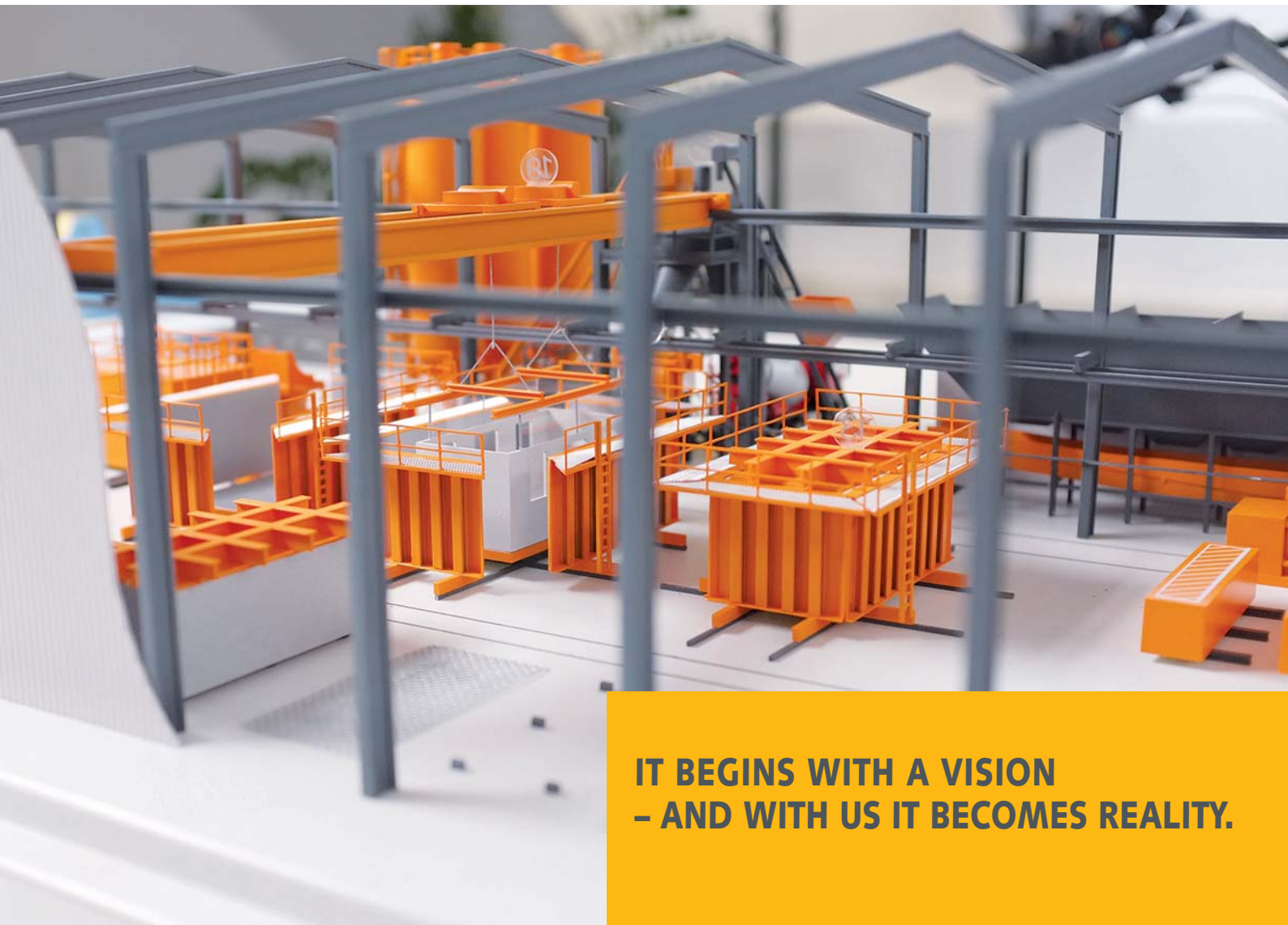
Project illustration by Llaxta

THE BASIC IDEA OF THE MODULAR HOUSING SYSTEM IS THE MONOLITHIC PRODUCTION OF A ROOM MODULE WHICH COMBINES THE SUPPORTING WALLS, FLOOR AND BEAMS. THE MAXIMUM DIMENSIONS ARE DETERMINED BOTH BY THE FUTURE RESIDENTS' NEEDS AND TRANSPORT LIMITATIONS.

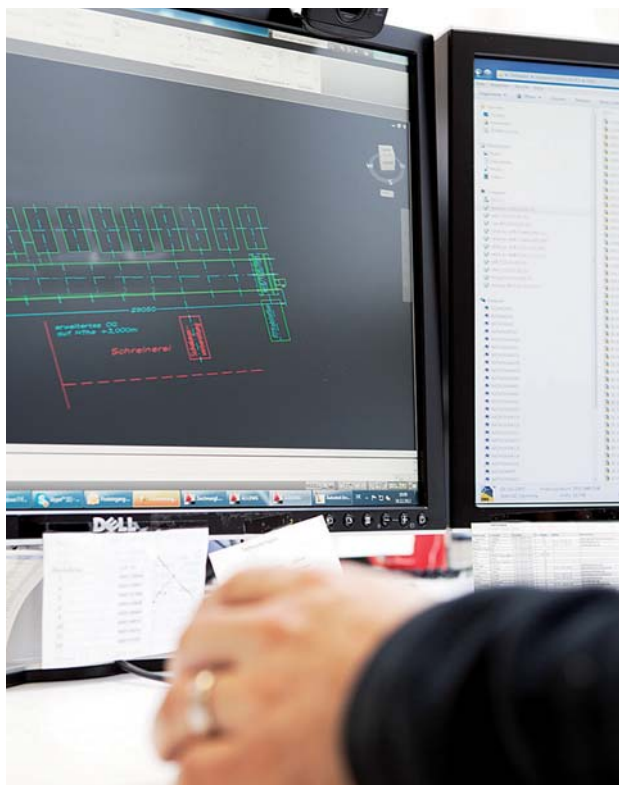


Example of conventional construction in Peru





**IT BEGINS WITH A VISION
- AND WITH US IT BECOMES REALITY.**



From the first draft through the modelling process to shipping the individual parts, everything is made in Hockenheim

We have succeeded in producing prototype houses that can be erected in very short times. A core module including plumbing, wiring and sanitary fixtures and fittings facilitates rapid construction work.

The rigorous development of this concept, in conjunction with upcrete® technology and the new modular form units, has opened up entirely new horizons for the industrial manufacture of residential space.

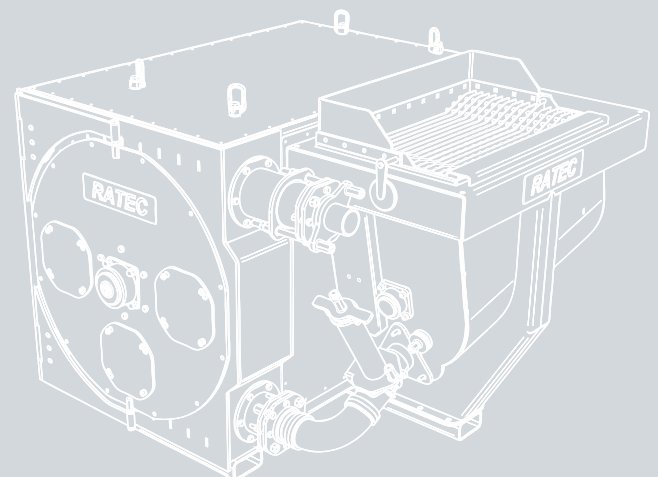
At Reymann Technik we can offer our clients everything they need, from engineering production plants to project management, feasibility studies and turnkey facilities, to ensure the smooth, efficient and economical execution of their modular housing projects.



Module and roof formwork in the newly constructed plant in Ica

UPCRETE® TECHNOLOGY IS UNRIVALLED

- Use of pre-aerated self-compacting concrete (SCC)
- Complete filling of even the most awkward geometries
- Formwork filled with concrete pumped upwards from below
- In situ production of complex concrete units
- Smooth form finish surfaces all round
- No screeding or smoothing of surfaces
- Minimal quantities of concrete residue
- Maximum dimensional accuracy of parts
- Quiet, minimal waste of materials, efficient and ecological concrete parts production
- Shorter formwork laying times





With complex geometries upcrete® really shows you what it can do.

Upcrete technology brings together all our expertise and know-how from the fields of building construction, factory planning, process control, employee training and mechanical engineering. With the upcrete® system, we set new standards for the integrated planning of work with precast concrete.

Upcrete® technology permits both the in situ production of complex geometries and smooth all-round form finish surfaces.

Coupled with intelligent formwork techniques and efficient pump technology, the upcrete® concreting system facilitates a highly efficient, flexible and modular production system using self-compacting concrete. Sophisticated upcrete® complete system solutions enable the production

of extremely high-quality precast concrete parts on economically viable terms.

UPCRETE® IS:

100% ENGINEERING FROM RATEC AND REYMANN TECHNIK.

100% PRODUCED IN-HOUSE.

100% KNOW-HOW GAINED FROM OVER 40 YEARS OF EXPERIENCE.

MODULE AND FLOOR FORMWORK PROTOTYPE TEST IN HOCKENHEIM



Opening the module formwork



Test casting the roof unit



Sharp edges and smooth form finish surfaces all round



The 'finished' product in use in Ica (Peru).



Sometimes something big comes from just a **small idea.**

Once you know the principle, it seems like simplicity itself, and you wonder why it took so long to come up with the idea of simply turning the world on its head.

Complex, rounded, smooth all-round form finish surfaces of high-grade appearance or all-round profiling cannot be produced at all using conventional concreting techniques nor with sufficient quality. All this becomes possible with the 'change of perspective' inherent in upcrete® technology. This involves filling the formwork with free-flowing self-compacting concrete (SCC) from below by pump, using the upcrete® concreting technique.

Because an upcrete® room module does not have to be turned round after the concreting process, but rather stands immediately on the floor on its formwork base, it offers the great advantage that the freshly concreted finished element can be quickly removed from the formwork and transported or reworked as necessary.

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80 HOURS
FROM THE FIRST TOUCH RIGHT
THROUGH TO COMPLETING THE
HOUSE





**MODULAR HOUSING
WITH UPCRETE® IS EARTH-
QUAKE-PROOF, CLIMATE-
FRIENDLY, EFFICIENT AND
ECONOMICALLY VIABLE.**





Even the foundations are prefabricated on-site.

The side formwork, inner core and covering can immediately be used for the concreting of the next room module, thus saving valuable production time and working hours, as well as reducing downtime. This monolithic production method therefore saves materials and is highly economical.

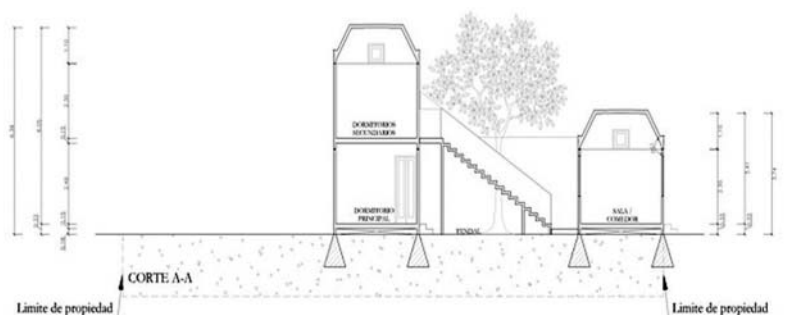
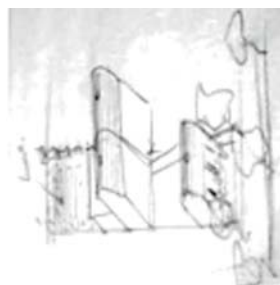
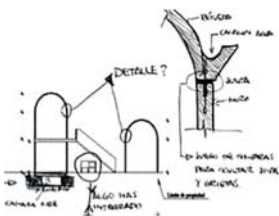
Another great advantage of the upcrete® technique is the high-grade surface appearance it produces. Using free-flowing concrete and distributing it within the formwork under pressure produces smooth walls and sharp edges of a high visual quality. Any desired shape can be produced as necessary, for example on the underside of the piece or on the upper edges of the walls. Extremely precise tongue-and-groove joints can be applied to the piece, as well as visually attractive surface features or structurally required recesses.

PROJECT DETAILS:

- 1× production hall 25 × 12 × 110 m
- 1× battery formwork, 6 bags 8 × 3 m
- 3× room modules 3 × 3 × 6 m
- 2× stair formwork
- 2× balcony formwork
- 2× pump car on UPP 100 basis



Our experience means the gap between **vision** and **reality** can quickly be bridged.



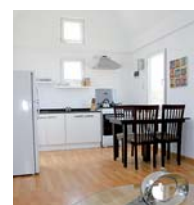
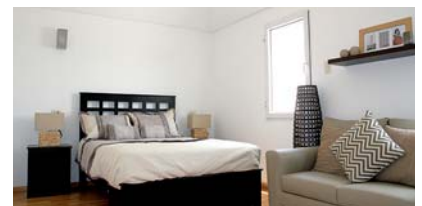


IT IS FASCINATING TO WATCH AS AN IDEA IS TRANSFORMED INTO A COMFORTABLE HOME.

The settlement is called Las Piedras de Buenavista, which roughly translated means The rocks of the beautiful view.



The name says it all – and highlights the aspirations firing the entire project. Thanks to the technical expertise, good project management and painstaking work of Reymann Technik, the goal of rapidly providing the region with ample quantities of high-quality housing could be achieved economically and efficiently to the satisfaction of all those concerned.

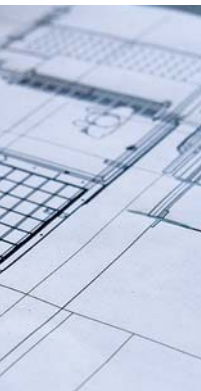
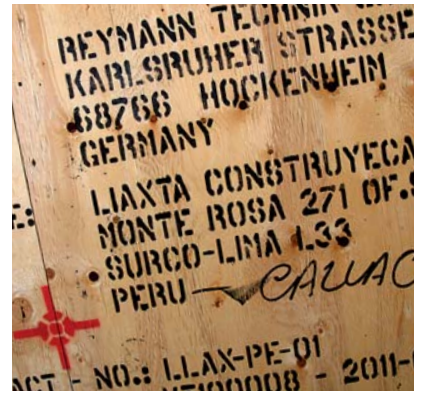
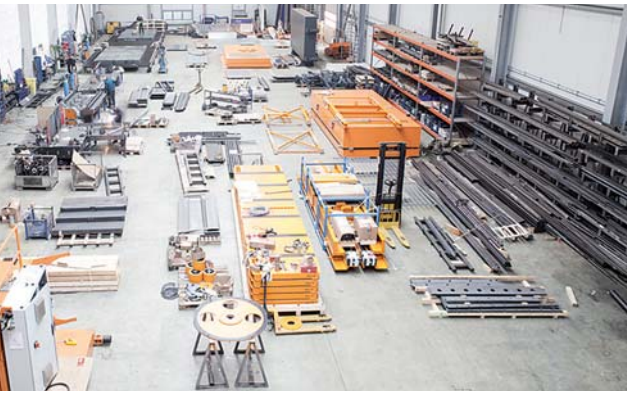


Cooperation involves certain prerequisites.

Our offer

1. Feasibility study for the first local module house factory according to defined basic conditions, worked out with an interdisciplinary international team.
2. Planning, realisation and delivery of a turnkey upcrete® module house factory on the basis of the feasibility study.
3. Support during assembly of the factory, with the necessary assembly units including training of the staff.
4. Regional license for production with the upcrete® technology and continuous support, development and improvement of the production area.





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