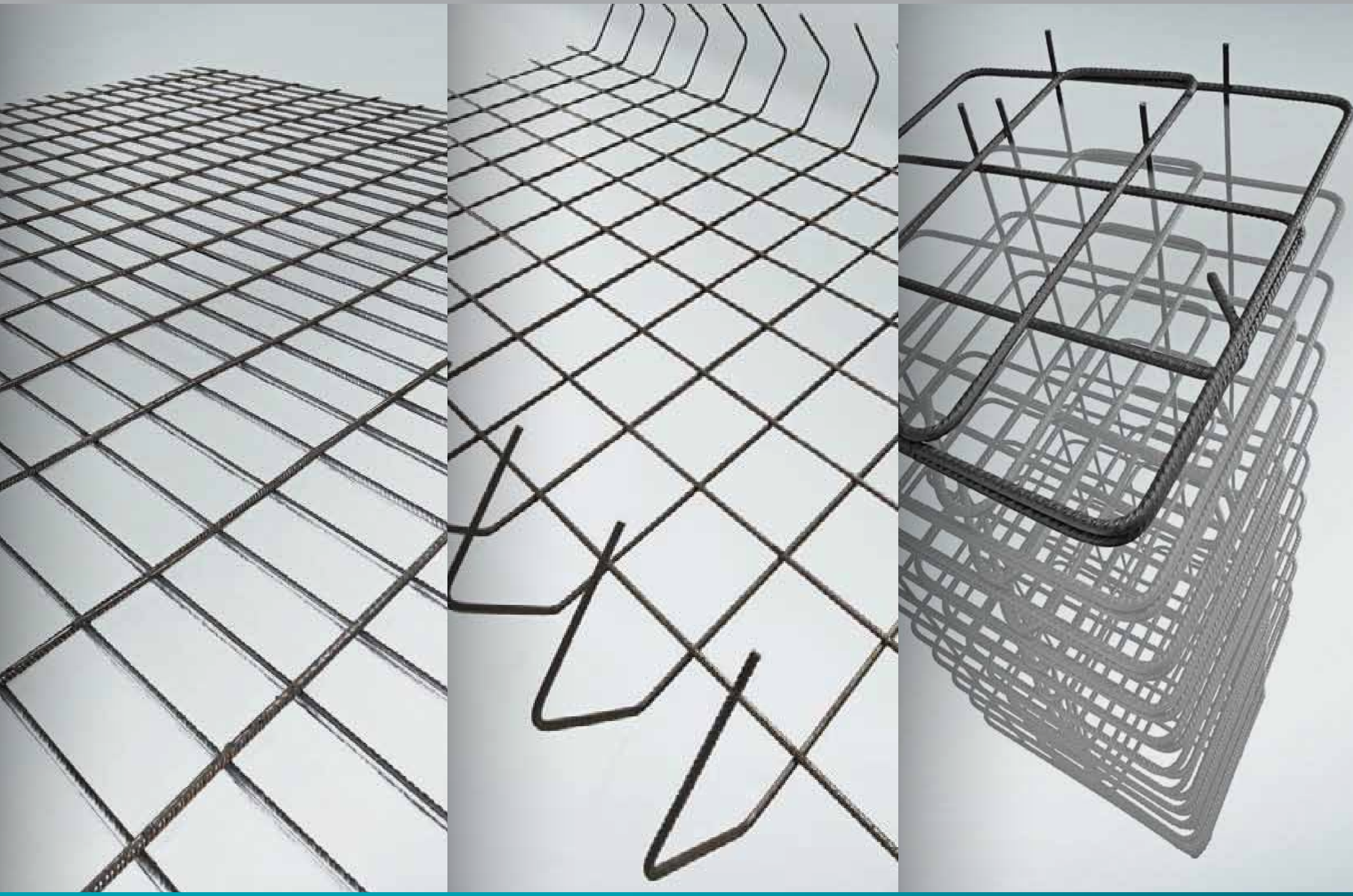

SYNTHESIS™

ULTRA-FLEX MACHINES

The new technology for industrial
prefabrication of reinforcing steel

A.W.M.®
AUTOMATIC WIRE MACHINES

SIDENOR
STEEL INDUSTRY S.A.

A. Longitudinal Wires straightening unit. Up to 6 independent rotating spinners
B. Cross Wires straightening unit. Up to 4 independent rotating spinners
C. Cross Wires feeding system with automatic change between different wire sizes

A. Longitudinal Wires aligning and loading system
B. Automatic Electrowelding Unit
C. Cross Wires Positioning system with above and below operation

A. Cross Wires Bending system. Two independent movable cross wire bending units. All position adjustments are done automatically.

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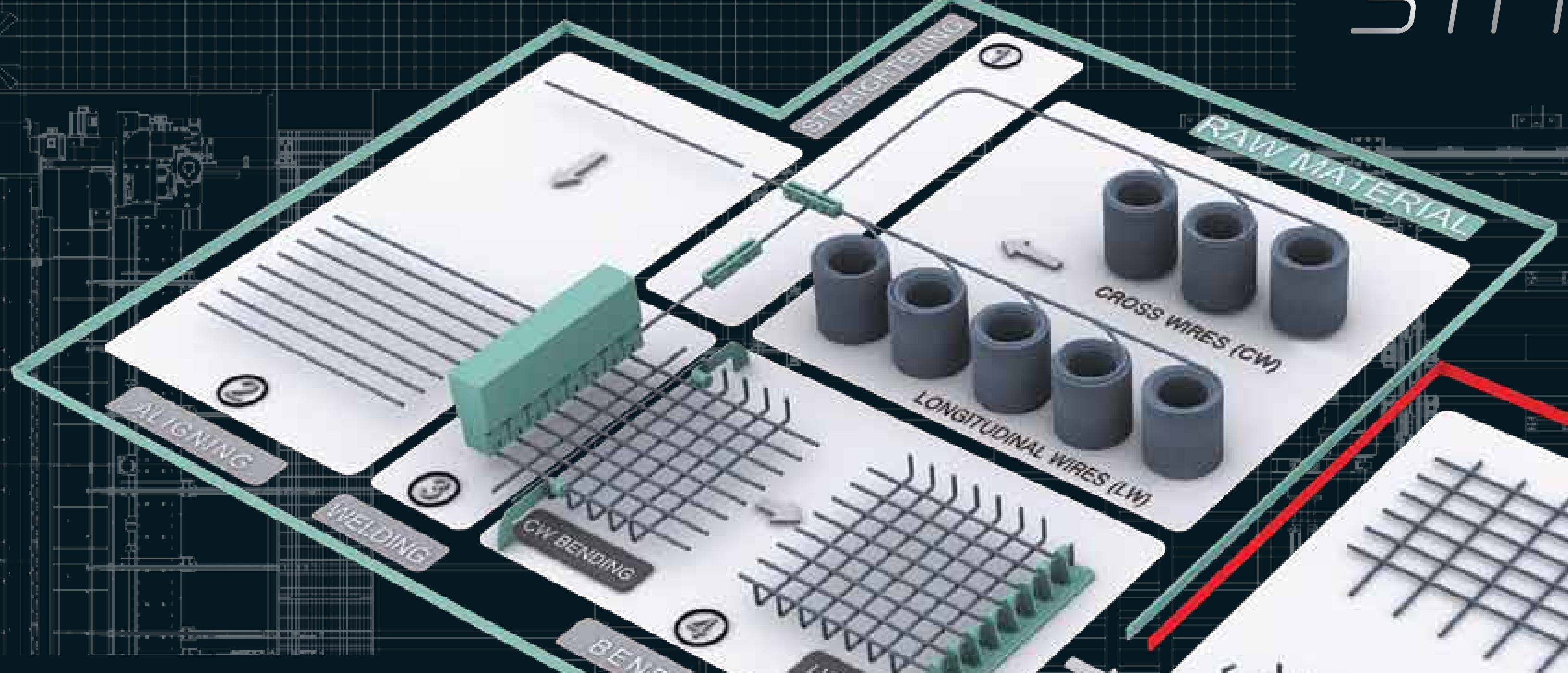
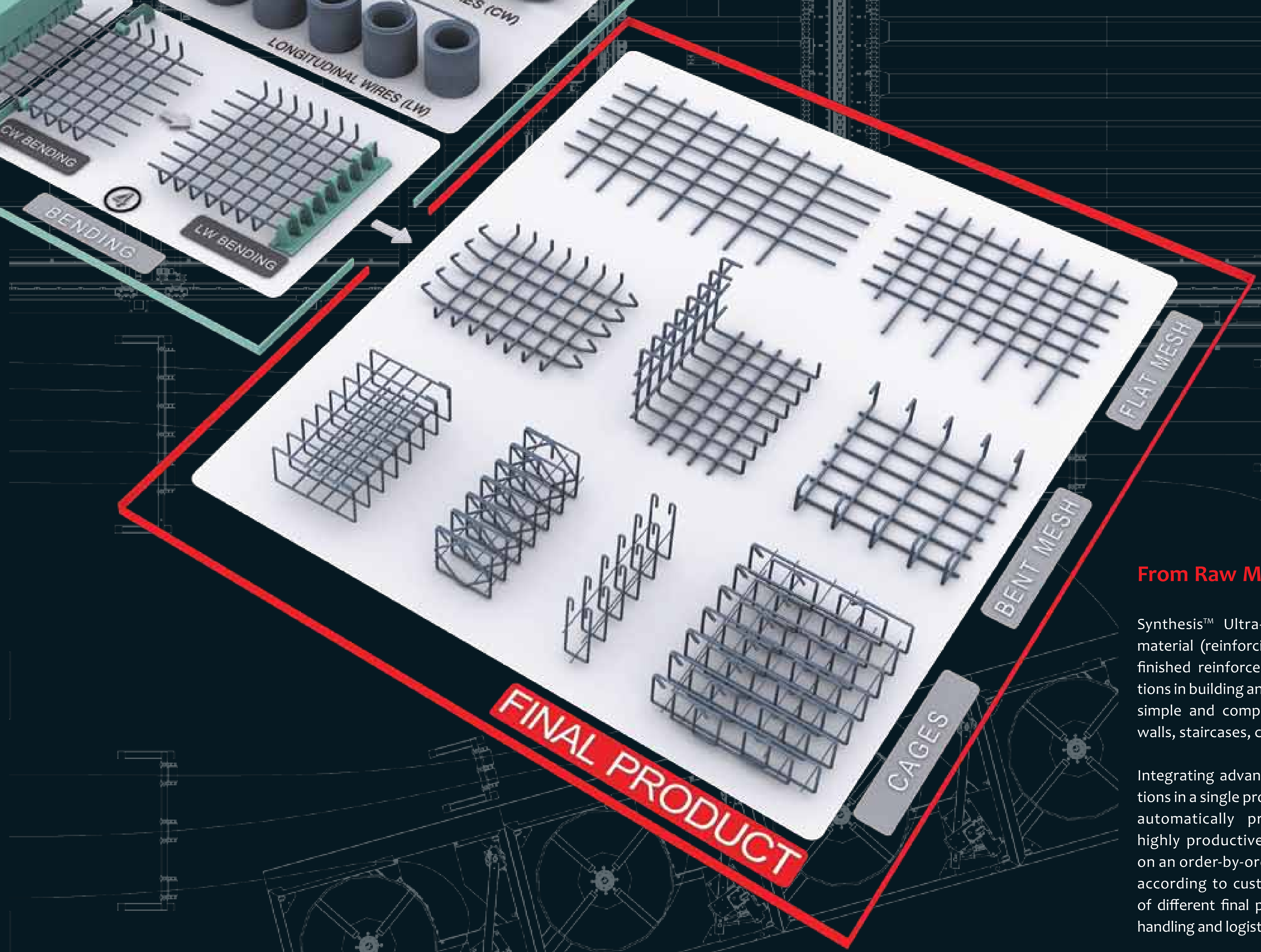




The Concept

STRAIGHTENING & ALIGNING
The automatic multi-straightening machine consists of multiple, high-speed rotating spinners with special hyperbolic rollers. It pulls, straightens and cuts one or two wires at the same time, so as to maximize efficiency. The bars are then aligned at the appropriate spacing (constant or variable) and moved towards the welding unit's loading area.

WELDING
The mesh is created by a heavy duty electro-welding unit. Based on the nature of the final products, the unit can be designed for various welding speeds. The mesh is then forwarded to the bending unit or it is directly discharged to the exit area.

BENDING
If the product requires its Cross Wires (CW) to be bent, this is done by the two movable CW bending units. So as to enhance the machine's output, CW bending takes place simultaneously with welding. If Longitudinal Wire (LW) bending is also required, the produced mesh is forwarded to the LW double bending unit, where all the bending operations -from very simple to highly complex ones- are done with three special carriages.

The machine's components and operational range can be fully parameterized according to customer specifications.

From Raw Material to Final Product

Synthesis™ Ultra-Flex Machines transform raw material (reinforcing steel in coil or bar form) to finished reinforcement for a plethora of applications in building and infrastructure projects (beams, simple and complex columns, shear walls, slabs, walls, staircases, culverts etc).

Integrating advanced welding and bending operations in a single production line results in a compact, automatically programmed, fully-flexible and highly productive machine. Synthesis™ operates on an order-by-order or element-by-element basis according to customer needs, delivering packages of different final products and thus avoiding costly handling and logistics.

A. Servo electric double bending unit. Clockwise and anticlockwise bends enabled
B. Servo electric carriage performing the bending process.

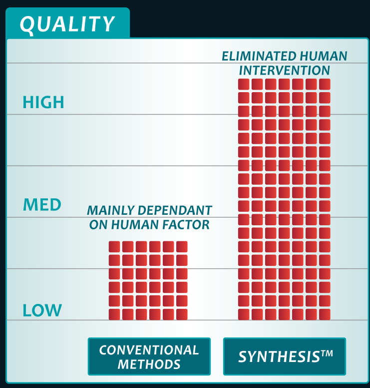
A. Extraction and Synthesis™ carriage. Extracts finished products to the exit carpet. Also, performs "Synthesis" operation (interlocking simple cages to form complex ones).

A. Motorized exit carpet for machine output. Divided into 2 independent sectors, so as to allow finished products to be handled with the machine still in operation.

BENEFITS OF THE TECHNOLOGY

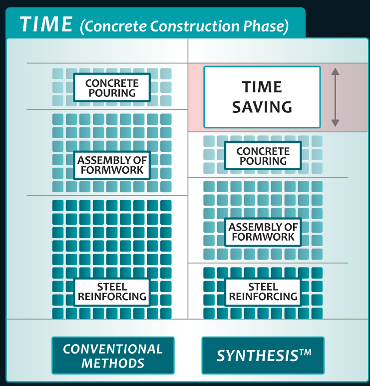
Synthesis™ products are fully-industrial ones, adhering to the most stringent regulations governing construction of reinforcement from welded mesh. They eliminate human intervention and are thus characterized by a reliability and accuracy that cannot be matched in practice by the conventional methods of reinforcement construction, where the human factor plays a crucial role.

The state-of-the-art industrial method of production achieves the highest possible precision in the products' geometrical characteristics (sides, angles, spacing etc). Finally, as welded products they have the necessary sturdiness during the transport, fitting and concrete pouring stages.



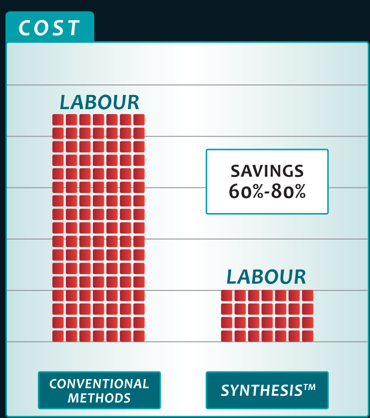
Synthesis™ machines are structured for fully-flexible just-in-time production that guarantees very prompt deliveries, a strategic advantage for markets characterised by intensive competition and fast-track projects.

The labor-intensiveness, low productivity and difficult to manage in-situ fixing are eradicated by substituting traditional reinforcement with Synthesis™ products, the use of which shortens the construction cycles and reduces the overall construction period of a project.



By perfecting the manufacturing process with a fully integrated production line that incorporates state-of-the-art robotic systems, mass production of highly fragmented prefabricated reinforcement of any complexity is achieved at very low cost with Synthesis™. The machine requires minimum personnel to operate and is very compact, hence saving a lot of space compared to any equivalent solution that reaches the same product output. The facility's cash flow management is enhanced, since the need to transport and store semi-finished products is diminished. Finally, the Synthesis™ software package saves a great deal of detailing and production planning work.

In addition to the manufacturing cost savings, major ones can also be captured in steel fixing processes that involve Synthesis™ products. Particularly for stirrup cages, the savings come from fixing the longitudinal reinforcement. This happens because the number of ties/welds needed when placing loose bars in a Synthesis™ cage is considerably smaller compared to the highly laborious conventional methods, where all longitudinal bars must be tied/welded in almost all stirrup corners.



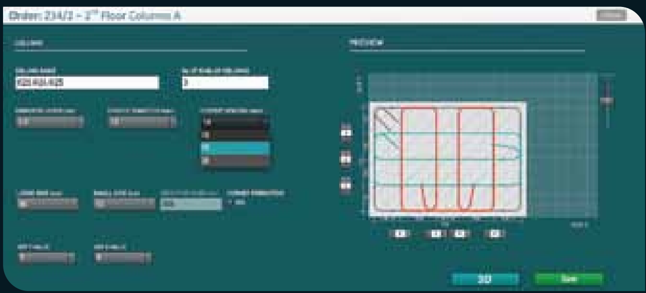
SOFTWARE

SYNTHECAD™

In order to handle the vast variety of Synthesis™ products in the most efficient way, a sophisticated internet/intranet-based Design Application has been developed that transforms any conventional reinforcement into a Synthesis™ product. The application is fully customizable so as to incorporate any particular product library.

SYNTHECOM™

A Management Application has been developed in order to speed up and simplify the respective processes for sales, production and logistics. The integration of any clients' existing ERP with SYNTHECOM™ is undertaken by PRAKSYS's high-expertise team of engineers.



SERVICES

AWM's high expertise in manufacturing automatic plants coupled with SIDENOR's extensive knowledge of downstream operations and the construction industry, guarantee unique pre-sale and after-sale services for Synthesis™ Ultra-Flex Machines.

Pre-sales

PRAKSYS's team of experienced Civil Engineers can carry out an in-depth market analysis and feasibility study, to propose a machine version and accompanying software that best suits each customer's particular needs.

After-sales

Synthesis™ Ultra-Flex Machines' clients can be provided with extensive training in SIDENOR facilities prior to machine installation and comprehensive seminars on the customized software package (SYNTHECAD™ & SYNTHECOM™)

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