CLEIA

Developing turnkey plants for the brick and roof tile industry

Products
NX, Tecnomatix

Business challenges
Adapting to emerging markets with lower-cost machines
Offering innovative new equipment to the international market
Building to custom orders

Keys to success
Focusing on innovation and productivity
Implementing smarter technical solutions
Honoring commitments

Results
Compressed design work by a factor of 3 to 5
Reduced energy consumption by more than 25 percent
Increased productivity with parameterization
Entered emerging markets

NX and Robcad help CLEIA to create cost-effective solutions for emerging markets

Using NX helps CLEIA to develop turnkey plants for making brick and tile
CLEIA develops and manufactures machinery and systems for brick and roof tile manufacturers. Company engineers carefully study the characteristics of different types of clay and construct and test each turnkey plant before delivery to a client’s site for installation setup and adjustment.

Jérôme Degueurce, general director and director of operations at CLEIA, says, “The choice of NX dates back to 1996. We were looking for software capable of managing large assemblies, such as for use in building a kiln construction, which requires assembling more than 50,000 parts. What was then known as Unigraphics seemed to us to be ‘the design software for these large assemblies.’ We went directly from the drawing board to using 3D CAD with the help of NX.”

Each project starts with a customer request for equipment to help produce an earthenware product using a specific type of clay deposit. Customers usually provide CLEIA with a model of the brick or tile they want to duplicate. “We begin by testing sizes and analyzing clay samples to verify their compatibility with the finished product,” Degueurce says. “These tests enable us to
fully understand production constraints, the optimum drying and firing cycles.”

After taking into account the required production capacity as well as other constraints, CLEIA engineers then define the best technological line to design the customer’s production plant. CLEIA supplies raw material preparation machinery such as grinders and mixers which transform the clay into a workable base mixture; the dryer which extracts the moisture from the clay; and the kiln to “ceramize” the products at temperatures near 1,000 degrees Celsius (C). The company also builds automatic equipment for brick and roof tile handling operations, as well as the packaging line for the products coming out from the kiln. The CLEIA factory management system helps the engineers to guide the equipment configuration and installation, providing reports on product quality as well as quantities used.

Each component is adapted and customized. For example, the dryer can be a continuous or a chamber dryer or use “Zephyr” technology – a fast, variable output tunnel dryer patented by CLEIA – an innovation entirely designed using NX™ software. Robots used in the handling circuits are defined by mechanical engineers using Robcad™ software in the Tecnomatix® portfolio from Siemens PLM Software. Robot programming is done in the robotics design department.

Designing a brick plant
It all begins with a 2D implementation plan in which all the production machines are represented in a 2D layout. Each piece of equipment is then studied in detail. A designer develops the equipment and makes production plans using NX.

“We use NX for designing automated mechanical machines, as well as for duct-work,” says Degueurce. “We do not do mass production, but almost always unit production. Although each new line is unique, the units are similar. Usually we start from an existing machine and change the parameters to define new equipment. The parameterization capability of NX is especially important at this stage.”

Moving to 3D design has enabled CLEIA engineers to significantly reduce errors. The ability to represent entire lines by combining various machines on the same line and on the same 3D plan has also enabled the company to reduce the number of iterations.

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General Director and Director of Operations
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Images generated from NX models enable customers to see realistic results of plant equipment and are also used in sales brochures.

Productivity has also increased as a result of using parameterization. Using standard or re-usable parts enables CLEIA engineers to leverage previous design work on new customer requests. Instead of “reinventing” the machinery completely, CLEIA engineers can re-use data and simply resize elements to fit each customer’s needs. An engineer completes the parameters on a worksheet and then uses NX to help generate the production study and detail plans for each machine. This can reduce detailed design effort by a factor of 3 to 5 on average, sometimes up to a factor of 10.

Time, cost and marketing benefits
CLEIA engineers use NX to develop company-specific tools that computerize some tasks and save time by automatically printing files, exporting designs, cloning parts, generating parts lists and editing interfaces. Images generated from models created by using NX enable customers to see realistic results of plant equipment and are also used in sales brochures.

Costs are reduced as a result of increased productivity and greater quality, both made possible through the use of NX. CLEIA has entered emerging markets by offering more innovative and less expensive solutions. “A significant innovation we have developed by using NX allowed CLEIA to penetrate this extremely competitive market,” Deguerce says. “To be competitive, we must be more innovative and offer smarter technical solutions. Because each customer is actually buying a result, production capacity and product quality are paramount. NX helps us distinguish ourselves through the superior value of our products.”

Future plans include the implementation of additional software systems, such as thermal simulation, because CLEIA intends to acquire in-house competency for designing dryers and kilns that reduce environmental impact.

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CLEIA
Solutions/Services
NX
www.siemens.com/nx
Robcad in Tecnomatix
www.siemens.com/tecnomatix

Customer’s primary business
CLEIA supplies turnkey industrial units and associated services for brick and roof tile plants, including raw material preparation lines, extrusion machinery, dryers, kilns, automatic handling, robotics and computerized supervision.
www.cleia.fr/en

Customer location
Dijon
France

A CLEIA patent is pending for the development of a kiln optimized for the reduction of thermal energy consumption. The kiln was designed within the framework of an ambitious project aimed at reducing energy consumption of industrial tunnel kilns for firing heavy clay construction materials by more than 25 percent. The project not only meets the economic and strategic needs of the earthenware sector, it will also help us to respond to one of the world’s environmental challenges.

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