SIEMENS
Ingenuity for life

Cospa

Developing injection molds gets easier – and faster – with the help of 3D design software

Product

NX

Business challenges

Implement a unified environment from design through production

Realize concurrent design

Dramatically reduce printed 2D drawings

Keys to success

Employ NX with synchronous technology

Restructure best practices

Optimize resources and workflow

Results

Significantly reduced order lead time through concurrent design and flexible resource assignment

Automated the entire plastic injection mold design and construction process

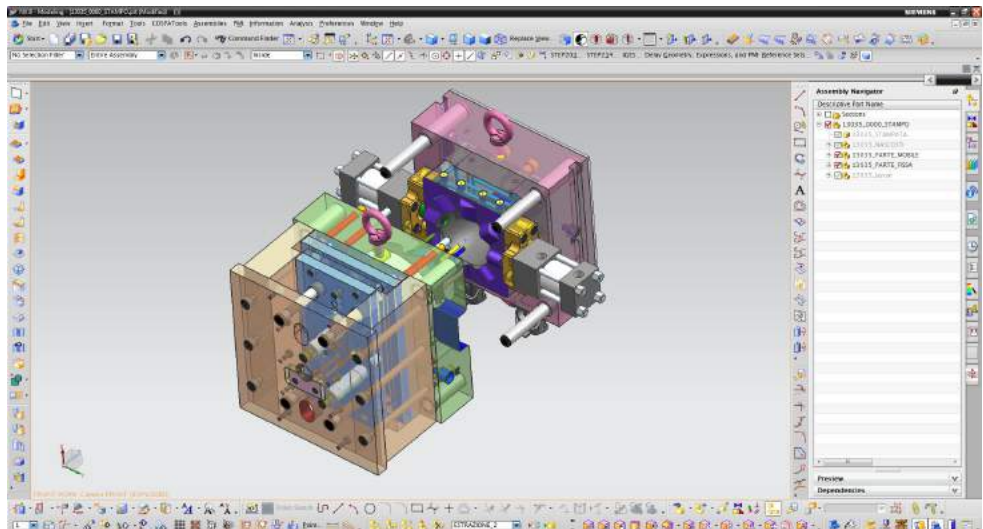Improved best practices, digitally generating all documentation, including bills of materials

Cospa uses NX to help automate and optimize mold workflow, including 50 percent faster CAM operations

A highly automated and efficient workflow for mold design and construction

Cospa, S.p.A. is a relatively small organization that has met the challenge of using leading-edge technology to substantially shorten its development process. Cospa is part of the Scame Group, which stemmed from the integration of two complementary companies with extensive know-how in the plastic materials transformation sector. Cospa provides specialized engineering knowledge relative to designing,

prototyping, engineering and manufacturing molds. Scame Mastaf provides advanced solutions for the injection molding of quality plastic components for large-series applications. Today, the Scame Group has more than 200 presses ranging from 40 to 1,600 tons in pressing capacity.

With advanced capacity, the product development process at Cospa now represents a completely unified computer-aided design (CAD) and computer-aided manufacturing (CAM) process, which typically starts with a 3D CAD model created by the customer and delivered to Cospa in a neutral file format. "Until a few years ago, we did a lot of co-design work with our customers," says Luigi Andreoletti, technical department manager. "Today, instead, we
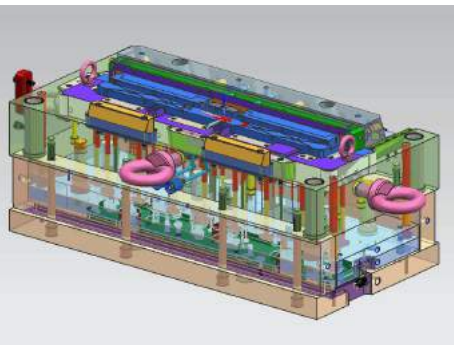
> "In only a few months of using NX, we achieved the same lead time as the previous solution. Then we shortened it further in the following months, also thanks to intensive training and support from Siemens Digital Industries Software specialists."
>
> Luigi Andreoletti
> Technical Department Manager
> Cospa

usually receive a full digital model from the customer, who requests it be designed so that it can be injection-molded. When the customer approves the model engineered by our designers, we move on to actual mold design with our CAD software and finally, our CAM staff makes the real mold."

When Andreoletti joined the company, he identified two major requirements for workflow organization. "First of all, we wanted a unified environment for design and production, with a direct and therefore faster transition from CAD to CAM," he says. "This approach also enables us to use our resources more flexibly, helping us balance workload peaks more efficiently. The second target was concurrent design, enabling us to assign two or more engineers to the same mold project to reduce lead time.

"In 2008, we launched a software selection process involving the systems of three vendors. Among all candidates, NX emerged as the best option, because it combined advanced CAD with basic management functions suitable for us, including file check-in and check-out, as well as excellent revision and version management."

Quickly up-to-speed
After selecting NX™ software from product lifecycle management (PLM) specialist Siemens Digital Industries Software, Cospa reorganized the company's design operations, defining new workflows in which a
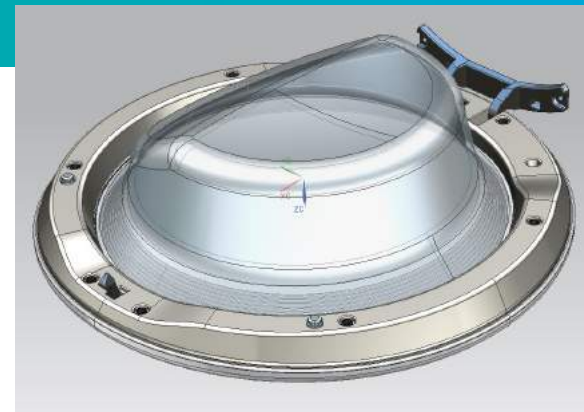
project leader assigns tasks to several designers in a simple and lean approach to product development. "This approach has proved to be more suitable to our organization," says Andreoletti. "All of our designers are pleased with the NX modeling suite. In only a few months of using NX, we achieved the same lead time as the previous solution. Then we shortened it further in the following months, also thanks to intensive training and support from Siemens Digital Industries Software specialists."

During this time, Cospa engineers also implemented the NX Mold Wizard package, helping to unify the internal libraries of mold bases and standard parts with their stocks and those of their suppliers, so that the company now has 3D models of all parts used in its products. Andreoletti notes that because NX is very easy to customize, the engineers were also able to model the standard parts required to create the mold's internal mechanisms, in compliance with the company's design and construction methods.

> *"NX emerged as the best option, because it combined advanced CAD with basic management functions suitable for us..."*
>
> Luigi Andreoletti
> Technical Department Manager
> Cospa
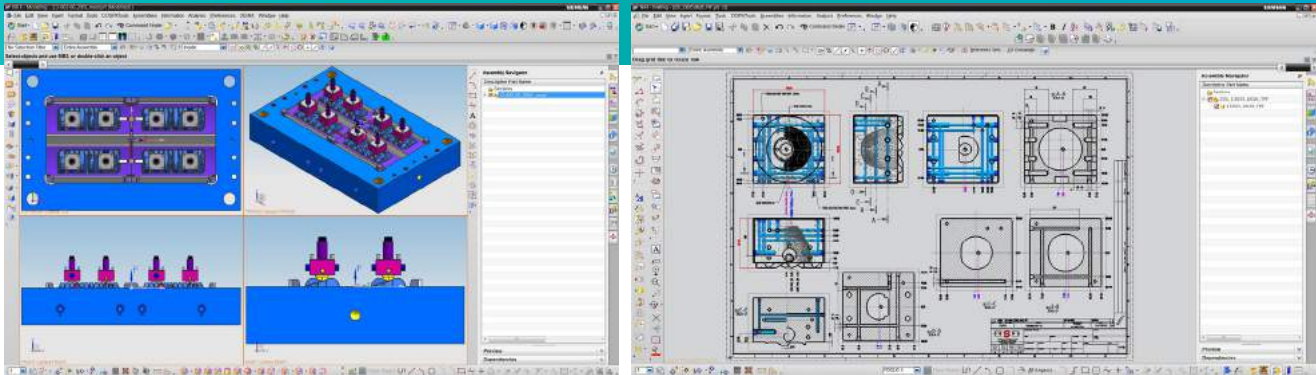
"The level of customization made possible using NX has enabled smarter decision-making during design."

Luigi Andreoletti
Technical Department Manager
Cospa

"The level of customization made possible using NX has enabled smarter decision-making during design," says Andreoletti. "By using standard parts, you avoid having to remodel the same parts over and over again. The correct positioning of parts inside the mold assembly is handled automatically, based on a structure we have defined in advance. The entire technical department has access to the latest solutions and most sophisticated design details."

50 percent faster with NX CAM
Using NX, Cospa has also accelerated data transfer to the CAM domain, including investing in the implementation of CNC programming automation using feature-based machining (FBM). FBM in NX CAM reads product manufacturing information (PMI)-specific attributes on the faces of the model created by the CAD designer, and automatically generates the machining sequence (based on standard rules defined and shared by the CAM area and workshop manager).

"Based on the attributes read from the model and found on our standard parts, NX CAM feature-based machining is used to generate a sequence of toolpaths and operations, always following the same logic," says Andreoletti. "As a result of such standardization, especially in the machining of mold stacks, we have become very fast. In one day, the CAM engineer can execute all operations on the fixed plate, moving plate, bottom plate, ejector plates and possibly mold-and-die plugs. Before, it took at least twice as long. But the greatest benefit is that we have been able to embed our technical know-how and experience into the system, incorporating standard rules and procedures. Today, the programming engineer who compiled these rules into the software under the guidance of our CAM manager can execute all standard operations quickly and reliably, achieving excellent results, although he has no mechanical engineering education. We adopted the same approach for electrodes and for wire cutting."

"The level of customization made possible using NX has enabled smarter decision-making during design. By using standard parts, you avoid having to remodel the same parts over and over again."

Luigi Andreoletti
Technical Department Manager
Cospa

"Based on the attributes read from the model and found on our standard parts, NX CAM feature-based machining is used to generate a sequence of toolpaths and operations, always following the same logic. As a result of such standardization, especially in the machining of mold stacks, we have become very fast."

Luigi Andreoletti
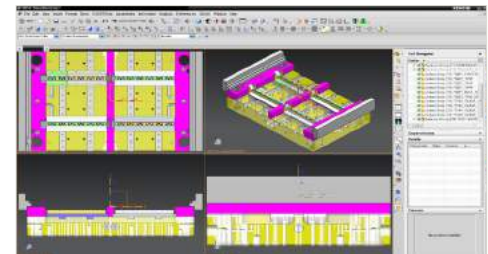Technical Department Manager
Cospa
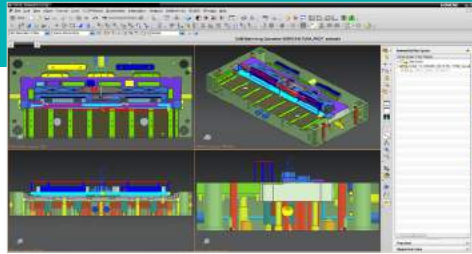
As a result of the management process that introduced direct CAD/CAM integration, the development of CAM programs now begins even before the CAD model has been validated. Later on, only the programs related to modified areas are re-processed. When the final CAM path is released, NX enables Cospa to automatically generate shop floor documentation, a set of HTML documents that illustrate all of the instructions and describe the resources needed to manufacture the part.

"The presetting island operator can view the bill of materials (BOM) together with the work piece clamping mode defined by the CAM engineer and replicate it on the real part," says Andreoletti. "Such documentation is also useful for milling machinery operators, who can view toolpaths and the corresponding machining areas at any time."

The Cospa workshop employs 15 people who can view the mold and its components directly from the 3D model, using NX Viewer on workstations installed on each island. "Another goal was to reduce the production of 2D print-outs," says

Andreoletti. "Today, we print 2D detailed drawings only for a few mold components, particularly for operations that are not processed by CAM, such as conditioning holes. Using NX Viewer, when specific dimensions or other information are requested, the operator simply views the 3D model, knowing for sure it is the latest version. This approach has mainly benefited the workers at the mold finishing and assembling workbench. They can access all information, cross sections and more, directly on the 3D model."

"Synchronous technology is just amazing," notes Andreoletti. "When we saw it for the first time, we were literally left astounded. Every year, our technical department handles approximately 400 orders, but only about seventy are new molds. The rest are modifications to existing designs. Synchronous technology helps us dramatically cut the lead time for modifications to molds developed outside our office."

"*Synchronous technology is just amazing... When we saw it for the first time, we were literally left astounded.*"

Luigi Andreoletti
Technical Department Manager
Cospa