SIEMENS

Industrial machinery and heavy equipment

Haidlmair

Injection molding tool maker saves time, enhances quality and eliminates errors

Products

NX, Teamcenter,
PLM Components

Business challenges

Design and manufacture
precision molds

Meet restrictive lead time
requirements

Eliminate quality risks

Prevent data misinterpretation

Enhance NC programming
accuracy

Keys to success

NX CAM for NC
programming work

NX CAD and Mold Wizard for
design process automation

Teamcenter for all design
and manufacturing data and
process management

Manufacturing Resource
Library for cutting tool
management

Results

Reduced design cycles

Eliminated data conversion
errors

Streamlined information
flow to shop floor
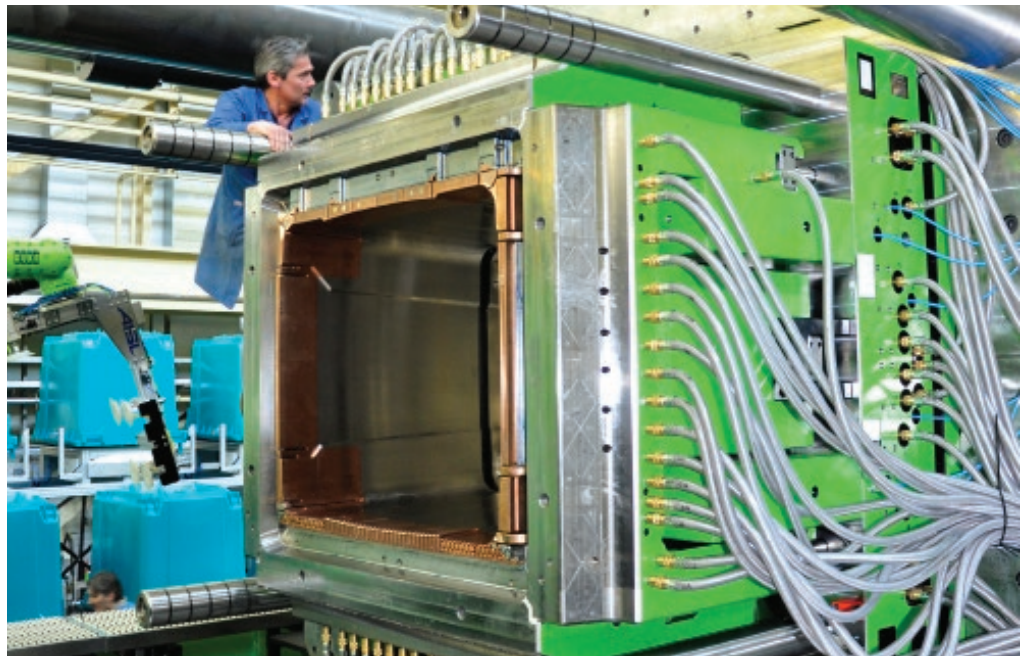
Haidlmair uses NX and Teamcenter to enable consistent information flow from top floor to shop floor

Think big in plastics molding
From toys to office machinery to house-hold products to packaging and automo-biles, there are very few things in everyday use that are not made, at least in part, using synthetic materials. Josef Haidlmair saw the potential of this technology and began employing new wire-cut electrical discharge machining (EDM) technology

in 1979 to develop molds for making plastic parts.

Today, Haidlmair GmbH is a leading supplier of injection-molding tools, predominantly for the production of larger and more complex parts used for products such as automobile radiator grilles and dishwasher panels. What has made Haidlmair grow into a group of companies with more than 450 employees and nearly 60 million Euros annual turnover, however, is the company's reputation for making superior high-efficiency molds used to produce crates and containers.

www.siemens.com/plm

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Christian Riel
Assistant Operations Manager
Haidlmair

For example, all five parts of collapsible crates are produced with a single "shot" of plastic. The molds for bottle crates are designed to enable the use of softer material for the handle areas of the crates, as well as in-mold-labeling. This adds to the appeal of the crates while making the products easier to carry.

The design process used by Haidlmair allows the molds to be compact and also shifts most of the weight away from moving parts, thus reducing overall product weight. This turns out to be a major advantage in molds for large containers such as garbage bins.

Early adopters of 3D modeling technology

In the past, customers typically provided Haidlmair with a drawing of the parts that needed to be molded. Part of Haidlmair's success can be attributed to the early adoption of computer-aided design (CAD) with 3D modeling technology, using NX™ software, a comprehensive and integrated CAD, computer-aided engineering (CAE) and computer-aided manufacturing (CAM) system from Siemens PLM Software.

"Our work using NX begins as soon as a customer provides us with information on the parts they require, which are usually in the form of 3D models," says Christian Riel,

Its sheer size alone makes injection molding a 1,100 liter garbage container an impressive task.
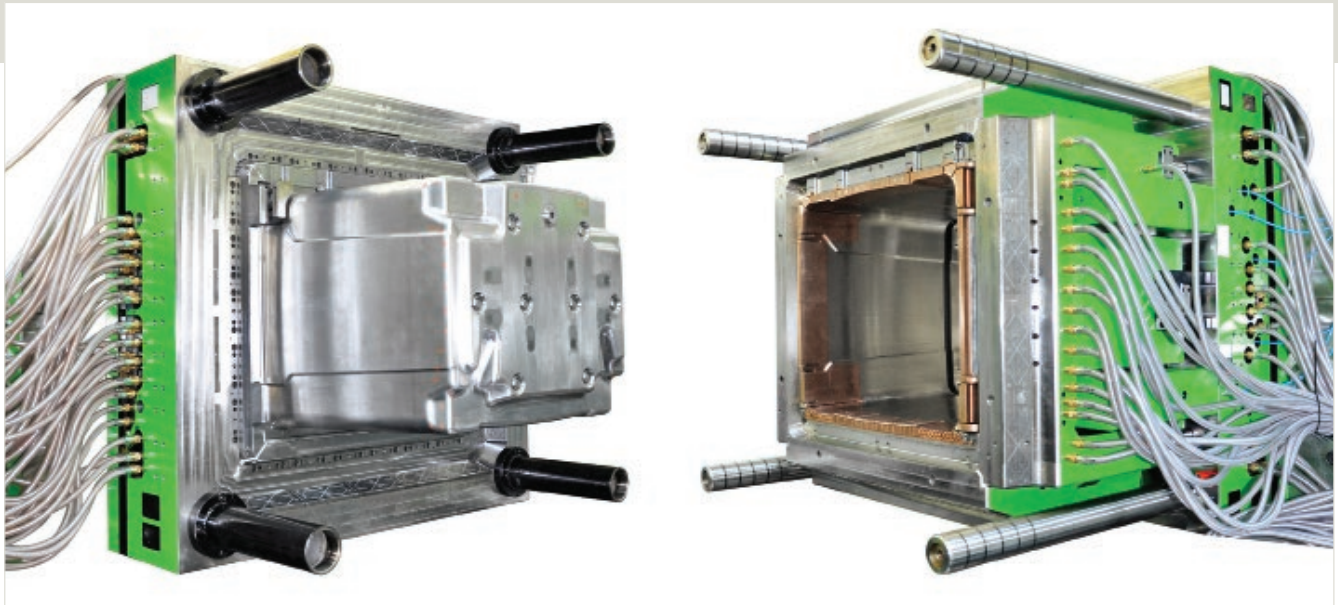
Weighing 62 tons, the mold comes with a weight reduction of 40 percent over conventional tools, resulting in cycle time and energy savings for each shot of a similar scale.

Haidlmair's assistant operations manager, who is in charge of process management. "The parts often require some modification, such as fixing impractical draft angles. Such issues, as well as other properties required for smooth injection molding, must be addressed during the early stages of mold design."

Haidlmair engineers use NX Mold Wizard for this purpose. In a step-by-step process, this NX add-on helps automate and optimize the mold design process. NX enables comprehensive data import of third-party design files and provides part design capabilities. Automation of mold-specific

design tasks is boosted by such features as manufacturability checking, advanced parting tools, automatic core and cavity insert creation, shrinkage calculation and adjustment, cooling layout tubes and fittings and automatic bill of materials (BOM) creation. There are also libraries of standard mold components, including mold bases, ejector pin posts, sliders and lifters. "Design work for what are usually rather complex molds would take much longer without the help of NX," says Riel. "Using NX means that our design engineers do not need to spend time manually designing all the detail."

"Our engineers have all experienced the numerous benefits of finding – rather than searching for – data using Teamcenter. They also find the time spent fulfilling bureaucratic tasks is greatly reduced due to the approval workflow process using Teamcenter, which they consider a huge benefit."

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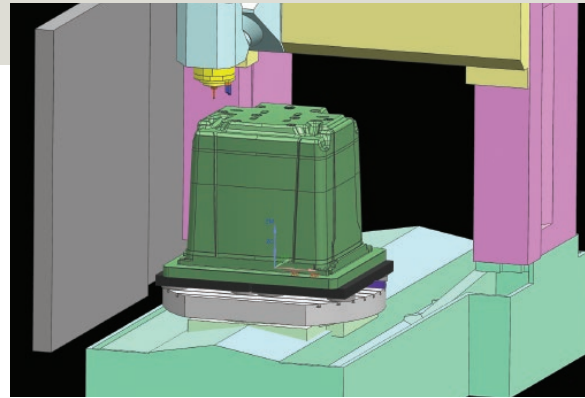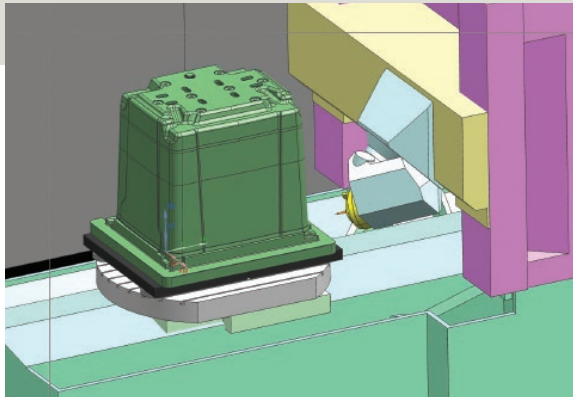
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Haidlmair engineers have also used NX CAE software for some time to generate the mesh used in mold flow calculations. More recently, the use of NX CAE was extended to include structural analyses for parts, which helps Haidlmair make sure handles or corners in crates and containers are strong enough to withstand expected loads.

High-speed metal cutting using powerful numerically controlled (NC) high-precision 3- and 5-axis machines has partly superseded the use of EDM. NX CAM is used to program these complex NC machines and provides advanced simulation and verification capabilities, as well as feature-based manufacturing for NC programming automation.

Data from a companywide repository
In 2008, Haidlmair started using Teamcenter® software from Siemens PLM Software for PLM tasks. "Collaboration among our engineers is enabled via the Teamcenter portfolio, including automated BOM transfer to the ERP (enterprise resource planning) system for procurement," says Riel. "Our engineers have all experienced the numerous benefits of finding – rather than searching for – data using Teamcenter. They also find the time spent fulfilling bureaucratic tasks is greatly reduced due to the approval workflow process using Teamcenter, which they consider a huge benefit. Consequently, in 2013 Haidlmair started a project to fully integrate all associated third-party design offices and freelancers into the Teamcenter system."

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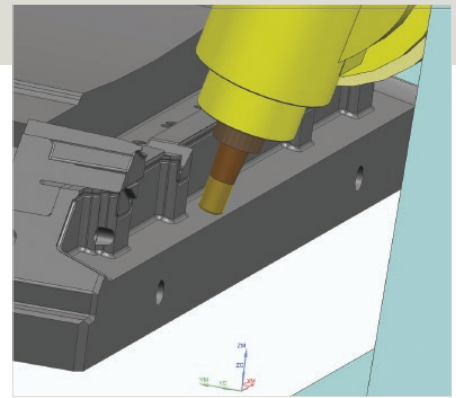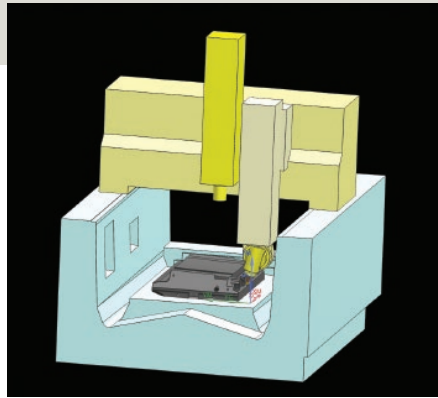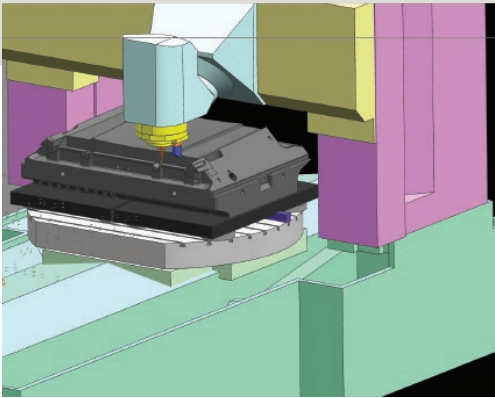
"The use of Teamcenter has considerably accelerated and simplified work for all involved, including people on the shop floor who do all the postprocessing to port programs to the machine selected for each job," says Riel. "Data access is via web browser, so all information, including 3D views of all parts and tools, is available throughout the company." The process was made even smoother with the introduction of a custom add-on module that enables postprocessing directly using Teamcenter.

In 2011, Haidlmair introduced cutting tool management using the Teamcenter machining resource manager utility, which is also used for machinery units, fixtures and clamping tools as well as templates. This greatly reduced tool administration because cutting tools are represented as components as well as assemblies, including the holders. These tools are included via 3D visualization for reality checks to eliminate error. "Top among the advantages of cutting tool management using Teamcenter is that all properties are hereditary, which makes combining properties easy," says Riel.

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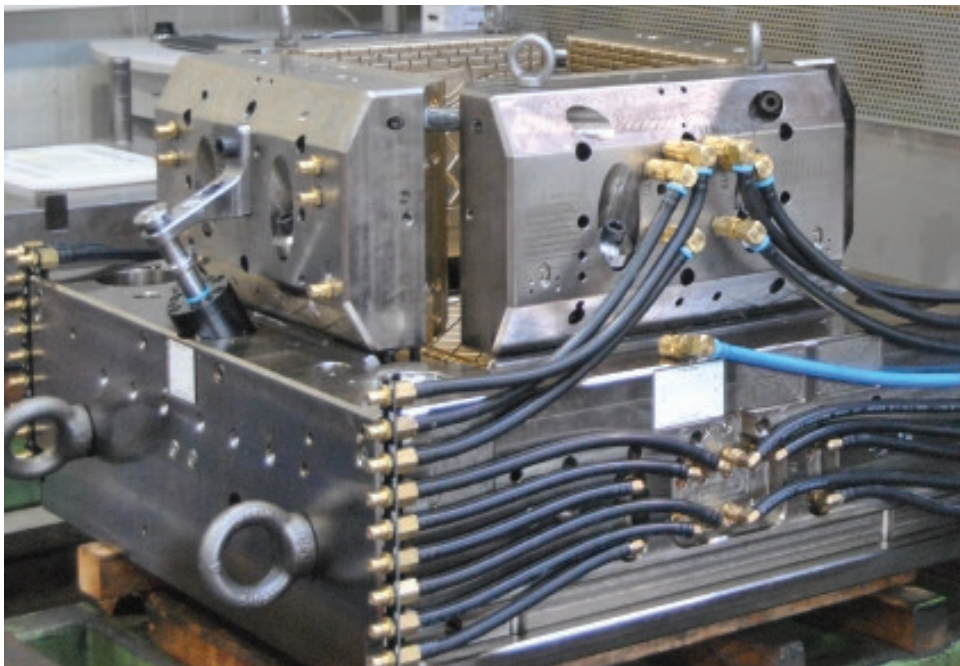
"Consistent information use and intelligent automatic support functionality – from part design to programming to tool handling at the machine – help us increase productivity while enhancing quality and process stability," says Christian Riel, assistant operations manager at Haidlmair.

*Haidlmair is a leading
manufacturer of
injection molds for
transport containers,
such as modern bottle
crates that include
elastomeric handle
components and foil
integration, all to be
produced in one shot.*

Increasing process efficiency via Manufacturing Resource Library and Geolus

Although Haidlmair had been using third-party direct numerical control (DNC) software for distributing the programs to the machines, company engineers recently began rolling out NX CAM software on the shop floor to enable operators to perform 2.5-axis programming for pockets without resorting to the machine's programming interface. This further enhances data consistency and eliminates interfaces and the potential for inaccuracy.

In parallel with this development, Haidlmair switched from using a machine tool library to implementing the Manufacturing Resource Library (MRL)

from Siemens PLM Software. The MRL helps NX CAM users find, select and retrieve tools for use in CNC programming from within the NX user interface without engaging a number of the capabilities of Teamcenter.

"The efficiency of the process of locating the right tool is even greater than expected because NX supports finding tools even with 10 percent deviations of their nominal sizes," says Stefan Pendl, Haidlmair's CAx (computer-aided technologies) systems administrator. Convinced that powerful search mechanisms can substantially increase efficiency, Haidlmair has also acquired a license of Geolus® software from Siemens PLM Software for evaluation. The software's unique ability to

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Solutions/Services

NX CAD
NX Mold Design
NX CAE
NX CAM
www.siemens.com/nx

Teamcenter
Manufacturing Resource
Library (MRL)
www.siemens.com/teamcenter

Geolus Search
www.siemens.com/plm/geolus

Customer's primary business

Haidlmair is the parent company in a group of 8 companies in 5 countries. The core business of the parent plant in Nussbach, Austria, is the production of injection molds with a focus on the full range of containers, supplemented by technical and automotive parts. The other companies in the Haidlmair group build thermoforming and stretch blow molds for the production of medical and packaging parts as well as automation solutions and extrusion dies for the production of files and sheets.
www.haidlmair.com

Customer location

Nussbach
Austria

In molds manufacturing, high-speed cutting on powerful, high-precision 3- and 5-axis NC machines has superseded the use of EDM almost completely.

find geometries similar to the one entered helps identify previously designed parts. This not only can reduce design time but, more importantly, subsequent machine programming efforts.

The power of integration

"NX and Teamcenter provide a powerful, integrated company-wide software environment with cutting-edge functionalities and they are relatively easy to implement, even in a company as complex as Haidlmair," says Riel. "Viewer capabilities are also provided for all non-CAx software users. Consistent information use and intelligent automatic support functionality – from part design to programming to tool handling at the machine – help us increase productivity while enhancing quality and process stability."