

# SIEMENS

*Ingenuity for life*

Industrial machinery

## Cometal Engineering

Aluminum foundry and extrusion plant maker optimizes projects with FEA

### Product

Simcenter

### Business challenges

Shorten development cycle to minimize lead time for large orders

Perform structural analysis with advanced, accurate and reliable tools

### Keys to success

Use Simcenter Femap for the structural analysis

Assign an engineer to handle FEA work

### Results

Optimized weights and materials

Minimized or eliminated need for physical tests on installed machines

Notably reduced costs

Provided immediate feedback/insight to designers and customers

Increased efficiency (single tool for both thermal and fluid dynamic analysis)

Accelerated product development cycle

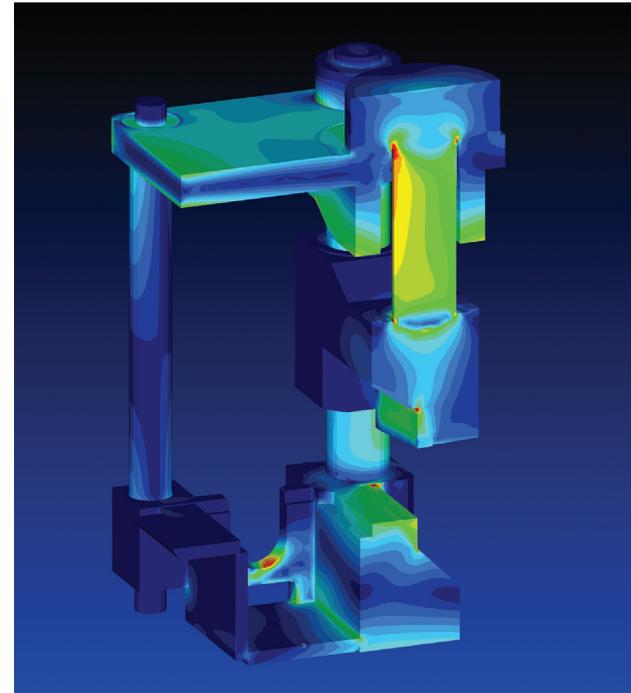
### Cometal uses Simcenter Femap to cut costs and increase operational safety

#### A story of rebirth

Cometal Engineering (Cometal) is a story of rebirth. Cometal was established in 2009 by Bruno Mancini, reviving a brand he created in 1980 and later sold to investors. Mancini gathered a team of former employees and colleagues to create the new Cometal Engineering. The company engineers and manufactures extrusion plants and foundries for aluminum billets and the re-melting of extrusion scraps, serving markets throughout the world. Cometal develops the entire production chain, including extrusion presses.

Simcenter Femap™ software, a finite element analysis (FEA) solution from Siemens Digital Industries Software, is helping Cometal Engineering achieve success by enabling maximum operating safety and optimized use of expensive materials.

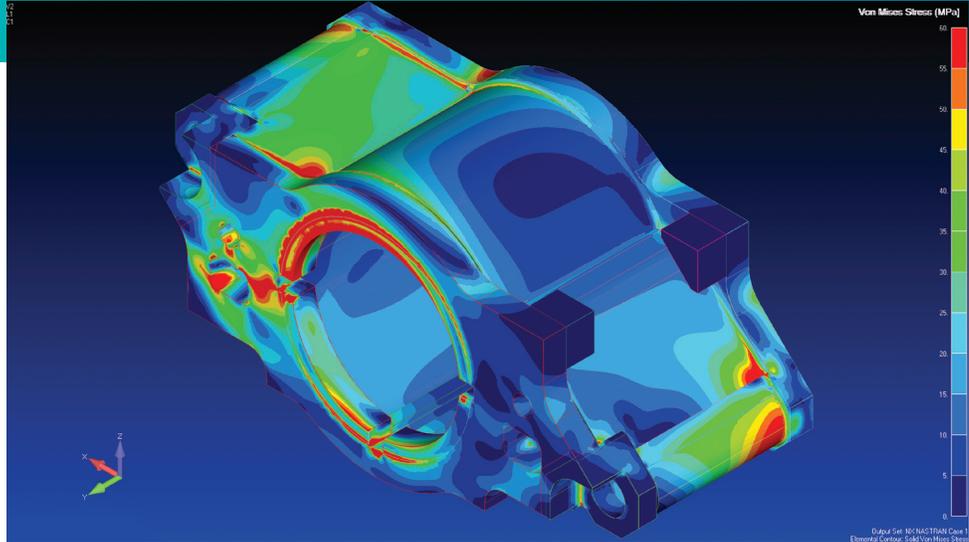
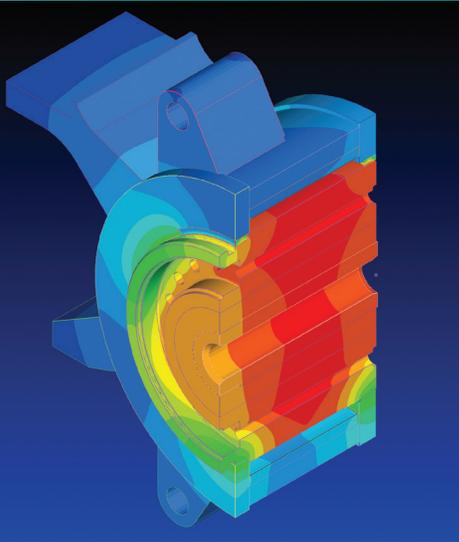
"The extrusion business is characterized by increasing price sensitivity," says Roberto Albertoni, technical manager at Cometal. "In recent years, Chinese, Taiwanese and Turkish suppliers have entered the market and standard production has shifted to those regions. In Italy, we preserved the business for special and high-tech plants, building three to four plants a year compared to the ten or twelve built by a company we co-own in China. The difference is due not only to market demand,



but also to the higher complexity, longer preliminary studies and more engineering stages required in Europe."

#### Innovative design

"All plants engineered by our technical department in Italy are designed specifically for each customer's needs," Albertoni says. Cometal Engineering's technical office is the hub of innovation, with engineers constantly looking for suitable technology to help design ever-larger and heavier products, such as plants for the production of metal bars and solid components. Designing



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Marcello Copetta  
Structural Engineer  
Cometal Engineering

these machines requires accurate analysis to maximize safety and optimize the weight and use of costly materials.

Design plays a key role at Cometal Engineering, where design engineers work closely with customers to define the plant layout and the feasibility of requested features and functions. During preliminary studies that can take as much as a year, designers formulate alternative options and perform multiple simulations. “Until a couple of years ago, our designers calculated efforts and stresses manually, using simple electronic spreadsheets,” says Carmine Serio, technical department supervisor at Cometal. “We analyzed stresses to calculate the durability of structures, including presses that are subject to high stress in which material weight has a significant impact.”

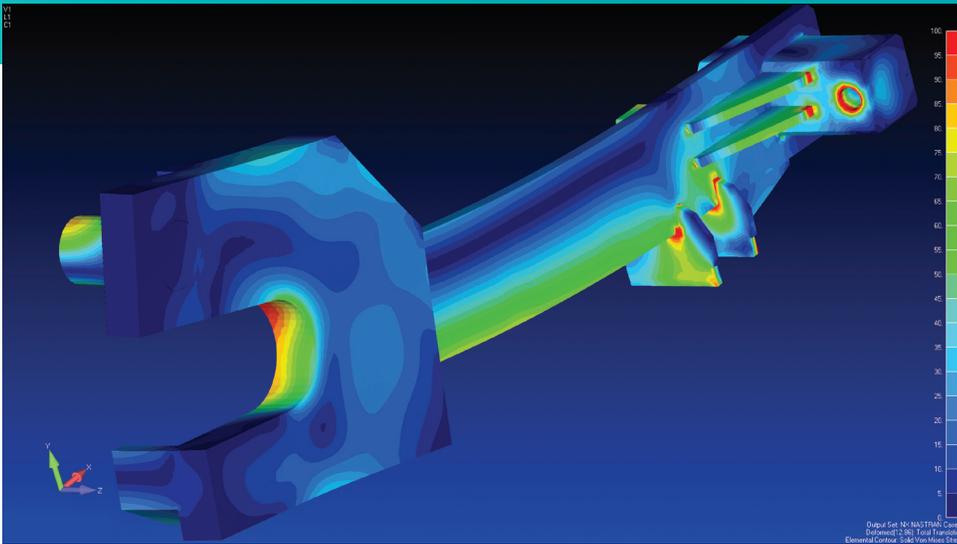
For unusual and complex cases, more advanced analysis and simulation capabilities were needed, beyond the capabilities common spreadsheets or even the 3D computer-aided design (CAD) software used by Cometal designers. Albertoni and his team decided to use specific structural analysis tools. After a software selection process, company engineers chose Simcenter Femap because it offers an advanced structural analysis environment with CAD-neutral and solver-independent technology. As evidence of the importance attached to the use of these tools, a new engineer was hired to perform structural analysis using Simcenter Femap.

#### **Expectations met**

Albertoni was familiar with Simcenter Femap, having used the software at a previous job: “I attended a Simcenter Femap

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Name  
Title  
Company



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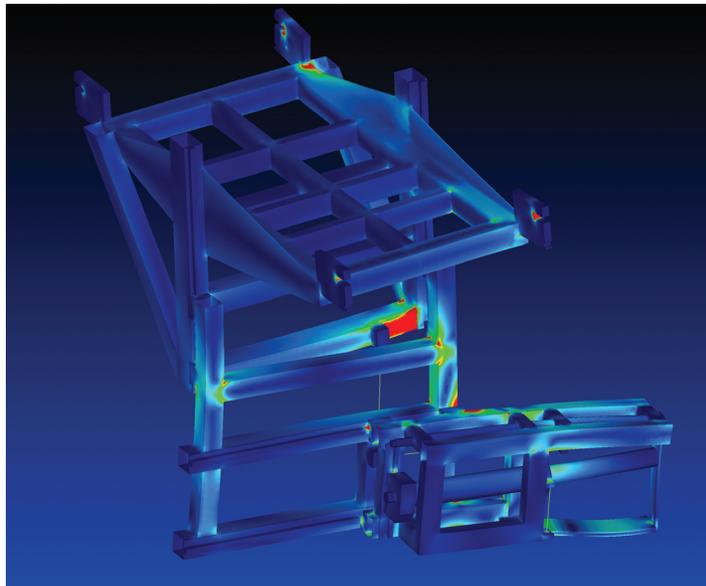
Marcello Copetta  
Structural Engineer  
Cometal Engineering

*“I attended a Simcenter Femap seminar to get an update on the software and I found answers to all our key requirements.”*

Roberto Albertoni  
Technical Manager  
Cometal Engineering

seminar to get an update on the software and I found answers to all our key requirements. So, we got in touch with Siemens Digital Industries Software partner Cosmos Italia to provide training and support for the FEA modeler.”

“Simcenter Femap is an advanced tool for which the designer’s input is essential. It is not a ‘black box’ that delivers generic results,” says Marcello Copetta, the engineer hired to use Simcenter Femap. “My task is to leverage the full potential of this tool, so that the company can develop expertise in all analysis fields. Simcenter Femap is used for various purposes, from conventional optimization studies and modifications to the critical areas of a structure, and deformation, which must comply with the limits fixed by the customer.”



# *Using Simcenter Femap enables engineers to perform all necessary calculations based on temperature presets, without switching to a different working environment.*

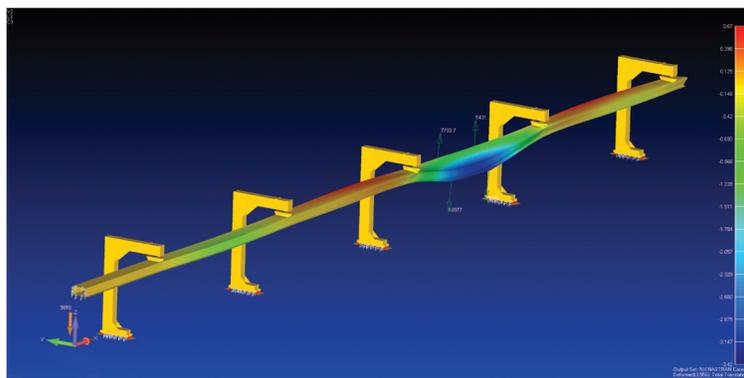
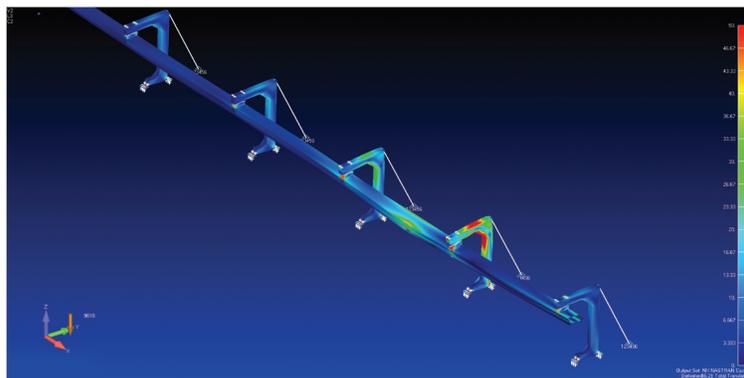
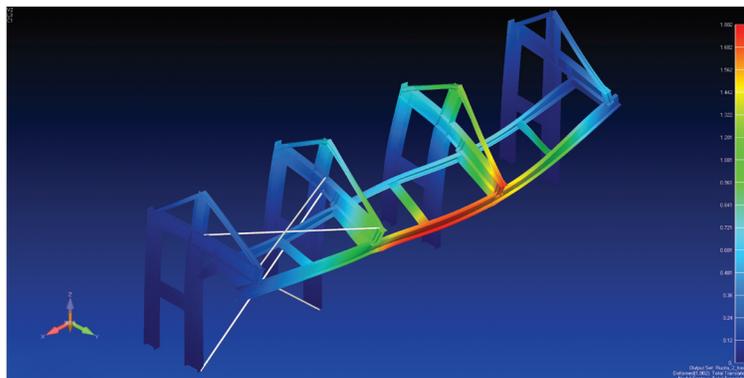
Copetta also executes extensive thermal simulations, defining temperature profiles under specific operating conditions and then applying working loads. Using Simcenter Femap enables him to perform all necessary calculations based on temperature presets, without switching to a different working environment.

“We can also perform transient analysis,” Copetta says. “When you put a piece into a furnace, if heating is not consistent and homogeneous, there will be a concentration of stress. Our plants reach temperatures up to 550 degrees centigrade, so heat stress on materials is massive. Simcenter Femap enables us to see the areas with the largest delta and determine whether worst-case scenarios might jeopardize the structure.”

3D models are created either directly using Simcenter Femap, read as Parasolid XT files using embedded Parasolid® software or imported via the STEP data exchange format. Parasolid is the world’s leading production-proven component geometric modeling solution, with approximately 45 percent of global 3D CAD models stored in Parasolid XT file format.

Analysis is usually limited to the minimum number of parts, to speed up computing and deliver feedback more rapidly.

“Simcenter Femap contributes to squeezing our development cycle, helping us meet the tighter and tighter lead times for orders,” says Serio. “Another benefit is the optimization of projects in economic



### Solutions/Services

Simcenter Femap  
siemens.com/simcenter-femap

### Customer's primary business

Cometal Engineering SpA specializes in the engineering and manufacturing of extrusion plants and foundries for aluminum and its alloys.  
www.cometaleng.com

### Customer location

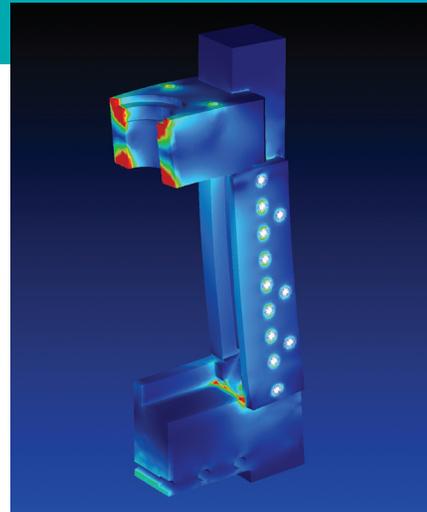
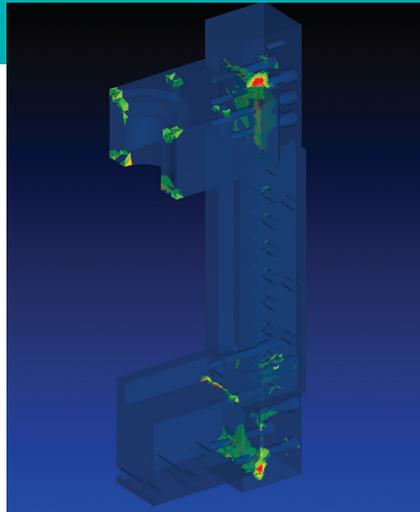
Montichiari, Brescia  
Italy

### Solution Provider Partner

Cosmos Italia  
www.cosmositalia.it

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Marcello Copetta  
Structural Engineer  
Cometal Engineering



terms. In the past, we could design by allowing for wider margins and oversizing. Now, we have to calculate all weights and materials accurately to cut costs. For this purpose, it is essential to have advanced tools such as Simcenter Femap for

accurate and sophisticated designs. Plus, by having a single tool for thermal and structural analysis, we can minimize or eliminate the need for physical tests on installed machines."

*"Simcenter Femap contributes to squeezing our development cycle, helping us meet the tighter and tighter lead times for orders."*

Carmine Serio  
Technical Department Supervisor  
Cometal Engineering

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