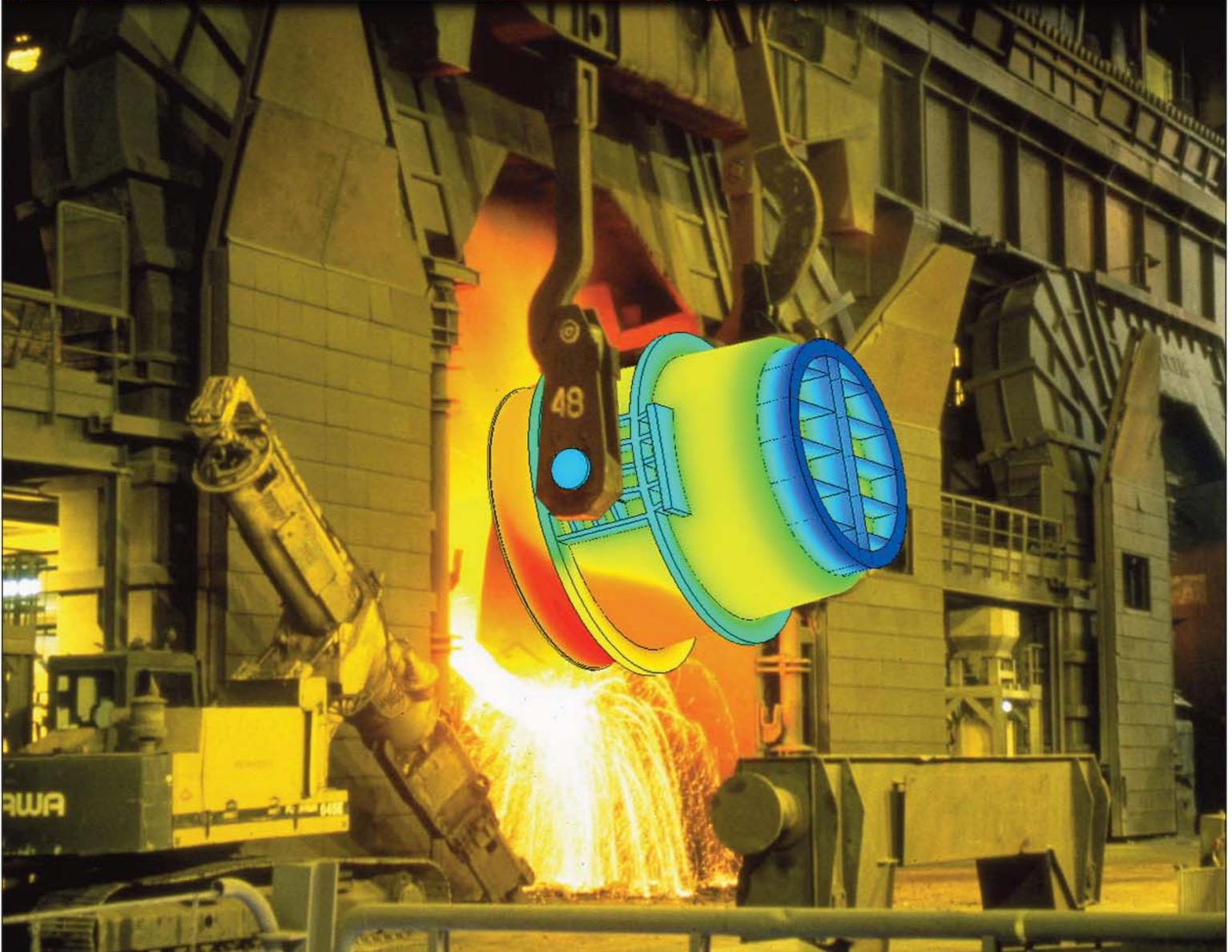
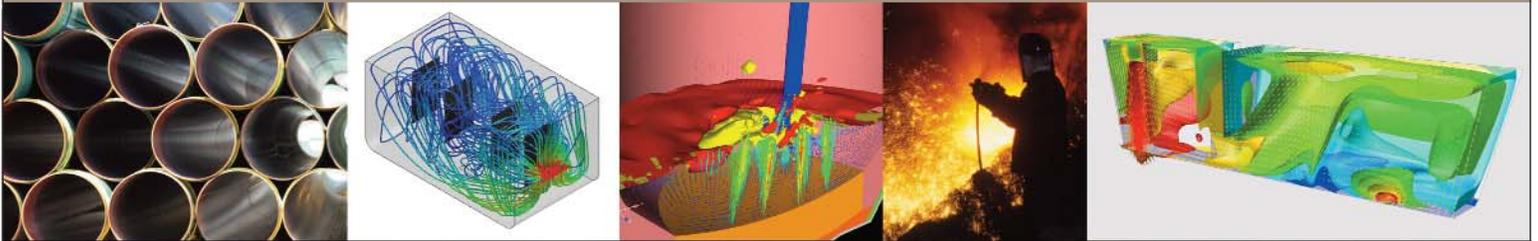


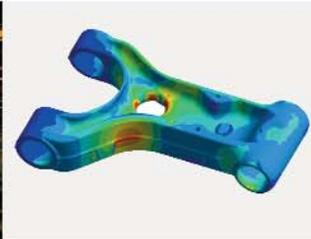
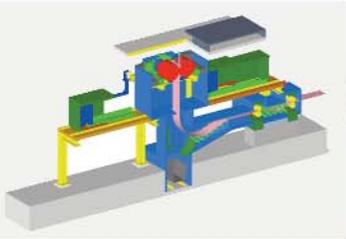


Engineering Simulation Solutions for the  
**metals** Industry



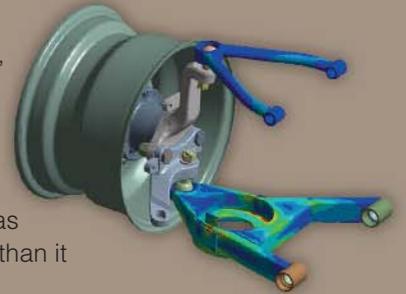


With the unequalled depth and unparalleled breadth of engineering simulation solutions from ANSYS, companies in the metals industry are transforming their leading-edge design concepts into innovative products and processes that work. Today, 97 of the top 100 industrial companies on the “*FORTUNE* Global 500” invest in engineering simulation as a key strategy to win in a globally competitive environment. They choose ANSYS as their simulation partner, deploying the world’s most comprehensive multiphysics solutions to solve their complex engineering challenges. The engineered scalability of our solutions delivers the flexibility customers need, within an architecture that is adaptable to the processes and design systems of their choice. No wonder the world’s most successful companies turn to ANSYS — with a track record of almost 40 years as the industry leader — for the best in engineering simulation.



## Challenges and Solutions

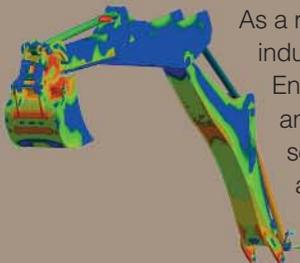
**W**ith the growth of an emerging global economy, the worldwide demand for engineering materials has steadily increased in recent years. Simultaneously, environmental concerns have put the spotlight on all manufacturing processes. Although engineering metals have a good environmental track record and can satisfy global end-user demand better than many other traditional materials, the energy requirements and process economics of metals are under unprecedented scrutiny. As a result, the importance of simulation-driven process and product design as well as optimization to solve time, price, sustainability and quality pressures is greater than it has ever been.



### Innovation and Quality

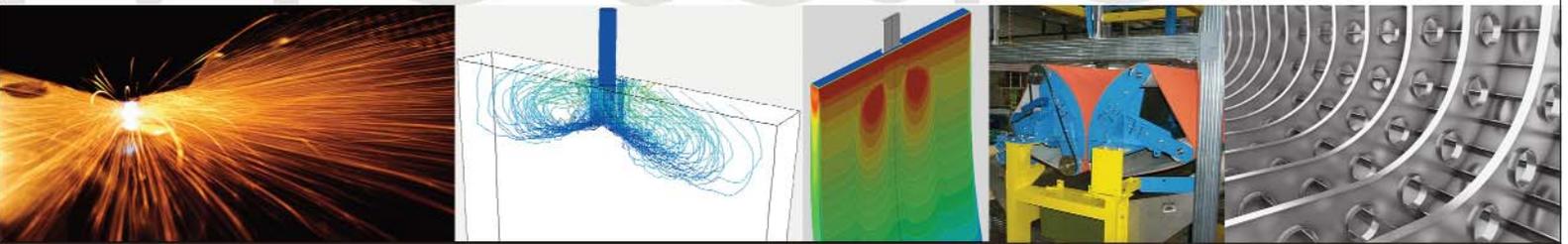
In a highly competitive global market, cutting-edge products and processes quickly become the norm. Through continuous innovation, improvements to the material properties and workability of engineering metals extend the range of applications in which they can be employed and the ease with which they can be manufactured. Within engineering simulation solutions, comprehensive multiphysics modeling allows existing processes to be optimized and new ones to be investigated in order to cost-effectively increase production rates and address the growing demand for metals.

### Energy Efficiency



As a result of the surging price of energy — partly induced by the rapid growth of metal industries in developing countries — profitability and competitiveness can be badly eroded. Engineering simulation allows for the systematic investigation of possible energy savings and energy recycling across the entire manufacturing process. Applying cost-effective solutions determined from analysis helps protect against these external economic forces as well as satisfying public demand for environmental accountability.

# metals



“Liebherr has found ANSYS to be a valuable tool for designing lightweight constructions with high load-bearing capacities. One of the most important aspects of crane construction is safety, thus steel constructions must be 100 percent reliable. This can be achieved only by using a highly dependable program such as ANSYS.”

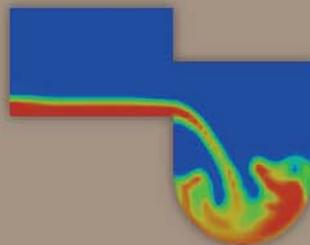
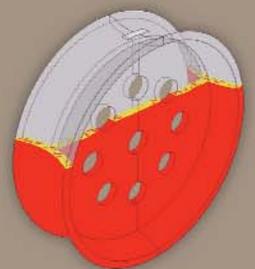
Dr. Norbert Stanger  
Liebherr Gmb

## Sustainability

Since the Industrial Revolution, the metals industry has been influenced by a constantly evolving world economy. Recently, concerns about the industry's impact on the environment have emerged as an important driving factor. For long-term success, metallurgy needs to evolve and adjust to new business drivers. It may also need to partially shift from traditional applications into newer, cutting-edge uses including electronics, semiconductor and biomedical applications. The evolution of applications, the trend toward a global green industry defined by local emission control regulations, and the decrease of available metal ores, necessitating increasingly effective recycling processes all call for the adoption of modern multidisciplinary modeling and simulation technologies.

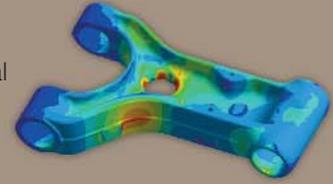
## Cost-Effectiveness

Economic globalization and rapid dissemination of technology require a permanent, cost-effective approach to maintaining or increasing activities at existing production locations. This often requires the retrofitting of manufacturing facilities. Virtual process modeling provides an efficient way to optimize each of these facilities — from mineral processing to the delivery of end-products — and provides the ability to identify savings that can be incorporated into new and innovative approaches.

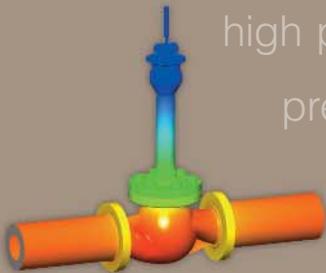


# Capabilities

- ▶ **Structural Solutions:** finite element analysis; static; dynamic; nonlinear material properties; fatigue; thermal; advanced nonlinear contact; other analysis capabilities for mechanical and materials systems
- ▶ **Fluid Simulation Tools:** computational fluid dynamics; gas/fluid flow analysis including phase change, chemical reaction, heat transfer, multiphase flow, burner design and combustion; melting and solidification; HVAC; emission controls
- ▶ **Multiphysics:** fully integrated two-way fluid structure interaction including moving/deforming domains, electromagnetic and acoustic
- ▶ **Geometry and Meshing:** flexible CAD import and cleanup, automatic meshing, adaptive meshing
- ▶ **Engineering Knowledge Management Systems:** centralize storage of simulation; archive and retrieve previous simulation work; integrate with current engineering workflow



primary steelmaking • iron • coke • blast furnace • preheater •  
secondary steelmaking • ladle • basic oxygen furnace • tundish •  
continuous casting • zinc • electric arc furnace • calcination •  
aluminum extrusion • plasma arc melting • recycling • **metals.**



high pressure casting • emissions control • copper casting •  
precious metals • decarburization • hydroforming •  
quenching • hydrometallurgy • ventilation • emission  
controls • Bayer process • Hall-Heroult cells •  
worker safety • extraction • argon rinsing station • aluminum casting

## About ANSYS, Inc.

ANSYS, Inc., founded in 1970, develops and globally markets engineering simulation software and technologies widely used by engineers and designers across a broad spectrum of industries. The Company focuses on the development of open and flexible solutions that enable users to analyze designs directly on the desktop, providing a common platform for fast, efficient and cost-effective product development, from design concept to final-stage testing, validation and production. The Company and its global network of channel partners provide sales, support and training for customers. Headquartered in Canonsburg, Pennsylvania, U.S.A., with more than 60 strategic sales locations throughout the world, ANSYS, Inc. and its subsidiaries employ approximately 1,700 people and distribute ANSYS products through a network of channel partners in over 40 countries. Visit [www.ansys.com](http://www.ansys.com) for more information.

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