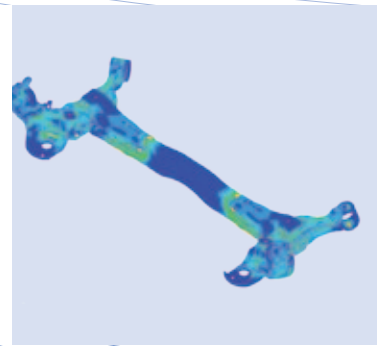
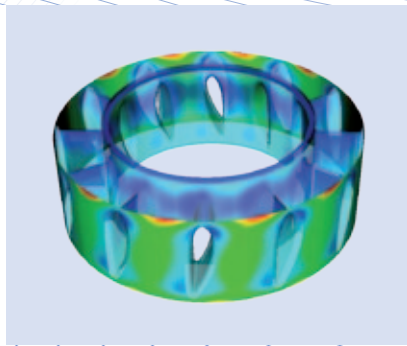
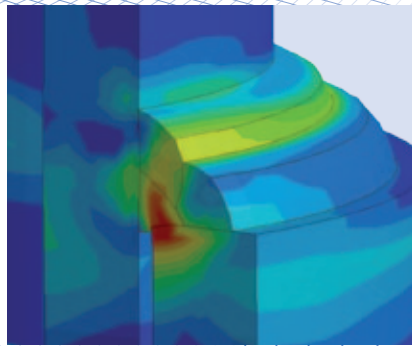


Welding Simulation Suite

From Fast Distortion Engineering & Fabrication Planning
to Weld Repair & Root Cause Analysis



ESI's Welding Simulation Suite

A single virtual welding manufacturing software for all your needs

IF YOU ...

- Want to virtually manufacture each welded design before it is fabricated or repaired.
- Work with structural steel, complex material, or dissimilar metals.
- Require your welded designs to meet tolerance requirements, at minimum cost and within minimum time - without going into all the details of complex physics.
- Need to optimize the distortion of a welded assembly, taking into account all process details.
- Need to ensure that the microstructure after welding meets your requirements.
- Need to determine residual stresses as basis for a high cycle low amplitude fatigue analysis, and to discover problem zones in the design.
- Want to understand the stress and fracture mechanics of the cladding, heat treatment, and welding process of large welded assemblies with dissimilar metals caused by the fabrication or repair process.

WITH THE WELDING SIMULATION SUITE

“Rolls-Royce found WELD PLANNER impressive due to the time taken to perform the analysis, the quality of results produced and the flexibility it offered in the early design cycle.”

Scott Wood, CEng MIMechE – Mechanical Engineer - Advanced Engineering, Transmissions, Structures & Drives, Rolls-Royce

“The very good interaction between our units and the ESI engineers and managers needs to be sustained as it gives to AREVA more flexibility and improves the quality of the numerical tools we develop together”.

Philippe Gilles, International Expert in structures and materials, AREVA

WELD PLAN

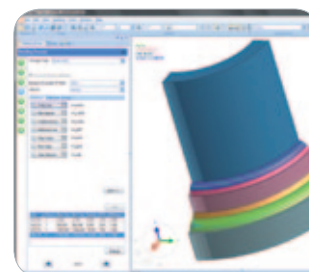
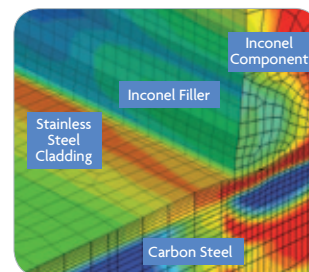
Virtual Welding Engineering begins with a Weld Plan. When numerous components, weld processes, weld passes, clamps and materials are involved, it is valuable to preserve an overview and be able to communicate the details of the virtual welding manufacturing process with your team and your customers. ESI's Welding Simulation Suite provides you with a solution for virtual welding manufacturing planning that allows smart communication and coordination.

CAD AND FEM MODELING

A state-of-the-art meshing tool is integrated in Visual-Environment, the Welding Simulation Suite's platform. It includes powerful tools dedicated to weld modeling.

MATERIAL DATA

Material behavior is complex, in particular when thermal and metallurgical properties are involved. A material data manager based on Microsoft Excel® helps you view, manipulate and generate properties with great flexibility. Existing databases cover most frequently used materials in the automotive, aerospace, chemical, energy & nuclear and heavy industries, and can be used as a ground for new material databases. All the physics of material is incorporated in the material database – there is no need to deal with material property details when setting up a simulation.



Visual-Weld: Simplicity is the key

PROCESS SETUP

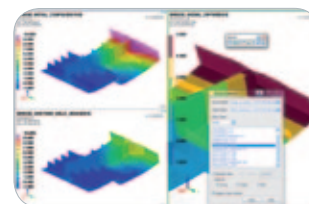
State-of-the-art graphic user interface allows you to set up a virtual welding fabrication process in the least possible time, requiring no more than welding engineering knowledge.

SOLUTION

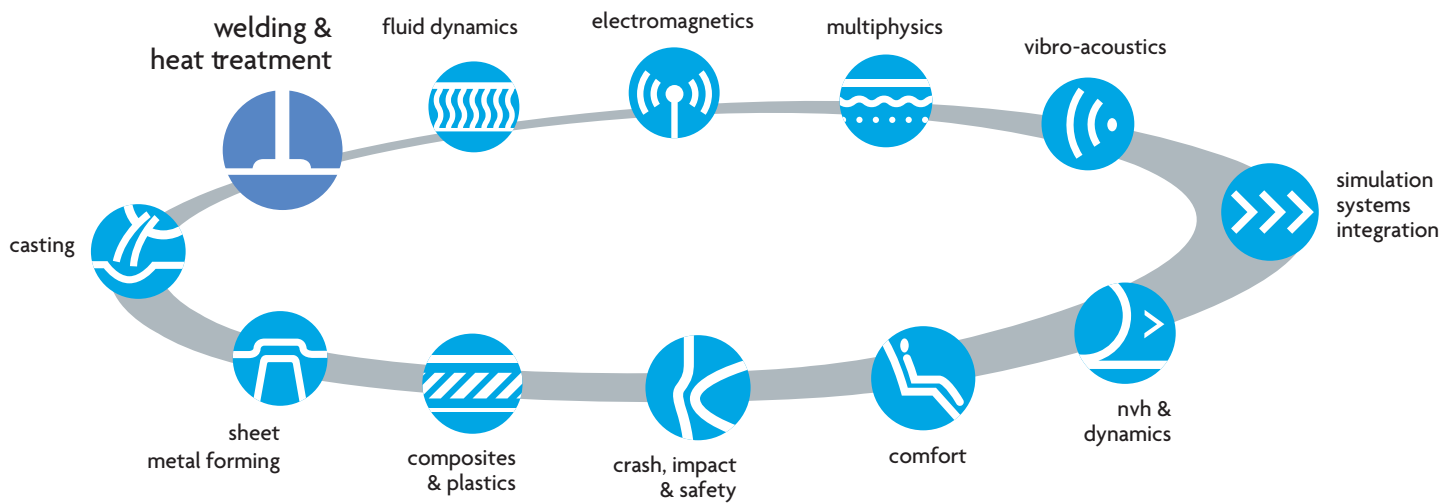
For fast distortion engineering, ESI's Virtual Performance Solution solver is used – an innovative tool offering unmatched DMP performance for large welded assemblies. For simulations involving complex material physics, the SYSWELD solver is used. It is the most precise multi-physics solver for welding and heat treatment processes on the market. Despite the complexity, the solution is completely automated. Thanks to advanced simulation engineering methods, complex problems such as large pressure vessel fabrication involving hundreds of meters of welds, dissimilar materials and various process steps like cladding, heat treatment and welding, can be solved in a reasonable time frame, without neglecting any material physics or fabrication details.

VISUALIZATION OF COMPUTED RESULTS

A state-of-the-art post-processing tool is integrated in Visual-Environment. It provides deep insight about welding fabrication effects. Several computed results can be reviewed simultaneously in multiple synchronized windows, guiding you through the evolution of the manufacturing process. A powerful result comparison tool allows to compare and display the differences between variants or process steps, no matter which result quantity is concerned.



Comparison of Clamping Variants – Bridge Segment



SELECTED CUSTOMER REFERENCES

AERO WIN TECHNOLOGY CORP., AIMEN, ARCELOR ARSA, AREVA NP, AUDI AG, AUTOMOTIVE SYSTEM GR., AWENGINEERING CO., BABCOCK & WILCOX CANADA, BARC - BHABHA ATOMIC RESEARCH CENTRE, BOSCH REXROTH AG, CEA LIST SACLAY, CHENDU AIRCRAFT INDUSTRY CO., CHENGDU SPACEON TECHNOLOGY DEVELOPMENT CO., DAIMLER AG, DENKIKOGYO CO., DOOSAN HEAVY, GE GLOBAL R & D CENTER, GE INDIA TECHNOLOGY CENTER, HITACHI, LTD., HONDA ENGINEERING CO., HYUNDAI HEAVY INDUSTRY, ITP - INDUSTRIA DE TURBO PROPULSORES, S.A., JAPAN ATOMIC ENERGY AGENCY, JFE STEEL CORPORATION, KAWASAKI HEAVY INDUSTRIES, KOMATSU LTD., LOS ALAMOS NATIONAL LABORATORY, MITSUBISHI ALUMINIUM CO., MURORAN RESEARCH LABORATORY, NISSAN MOTOR CO., PETROBRAS - PETROLEO BRASILEIRO SA, POSCO, PRESS KOGYO CO., PSA PEUGEOT-CITROEN, ROLLS-ROYCE PLC, SCHAEFFLER KG, SERCO ASSURANCE, SHENYANG AIRCRAFT INDUSTRY, SHENYANG LIMING AERO-ENGINE GROUP CORPORATION LTD., SIEMENS PG, SIEMENS TRANSPORTATION SYSTEMS, SKF SVERIGE AB (SKF GROUP), SKODA AUTO, SVENSK VERKTYGSTEKNIK AB, TATA STEEL EUROPE, THE JAPAN STEEL WORKS, THYSSENKRUPP, TOSHIBA CORPORATION POWER SYSTEMS & SERVICES COMPANY, VITKOVICE HEAVY MACHINERY A.S. AND POWER A.S., VOLKSWAGEN AG, XI'AN AEROSPACE ENGINE FACTORY, ZF FRIEDRICHSHAFEN AG.

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ABOUT ESI GROUP

ESI is a pioneer and world-leading provider in virtual prototyping that takes into account the physics of materials. ESI has developed an extensive suite of coherent, industry-oriented applications to realistically simulate a product's behavior during testing, to fine-tune manufacturing processes in accordance with desired product performance, and to evaluate the environment's impact on performance. ESI's solutions fit into a single collaborative and open environment for End-to-End Virtual Prototyping, thus eliminating the need for physical prototypes during product development. The company employs over 800 high-level specialists worldwide covering more than 30 countries.